*Student Corner*

# A Study on Analysis of Factors Affecting the Price of the Commodity Silver

**Mr. Satish A.J. and Mr. Uppara Rama Krishna**
Final Year MBA,
Acharya Bangalore B School, Bengaluru

**Abstract:**

*Commodity trading provides an ideal asset allocation, also helps one hedge against inflation and also helps buy a piece of global demand growth. The price of silver has been very volatile historically. Although the ratio of gold to silver prices has varied over the past, in recent times we observe that silver prices follow gold prices and may act as a substitute for them in the future. This article tries to identify the major factors that cause volatility in the silver prices and analyze in detail the impact of these factors on the silver prices.*

**Key words:** Silver price, commodity market, volatility.

**Introduction:**

Commodity market is an important constituent of the financial market of any country. It is the market where a wide range of products, viz., precious metals, base metals, crude oil, energy and soft commodities like palm oil, coffee etc. are traded. It is important to develop a vibrant, active and liquid commodity market. This would help investors hedge their commodity risk, take speculative positions in commodities and exploit arbitrage opportunities in the market. One may have their debt and equity funds in place, but investing in commodities could just be the one element to improve their portfolio.

With this study we try to inform the investors those are interested in commodity market about the general logic of the market, specific details of the product they are going to invest and to know the factors that affect the prices and the correlation of the product they invested with the other products.

**Background of Commodity Market:**

The first commodity exchange was set up in India by Bombay Cotton Trade Association Ltd. and formal organized futures trading started in cotton in 1875. Subsequently, many Exchanges came up in different parts of the country for futures trade in various commodities.

**National commodity exchange**

In enhancing the institutional capabilities for futures trading the idea of setting up of National Commodity Exchange(s) has been pursued since 1999. Three such Exchanges, viz, National Multi-Commodity Exchange of India Ltd., (NMCE), Ahmedabad, National Commodity & Derivatives Exchange (NCDEX), Mumbai, and Multi Commodity Exchange (MCX), Mumbai have become operational.

MCX:MCX (Multi Commodity Exchange of India Ltd.) an independent and de-mutilated multi commodity Exchange has permanent recognition from Government of India for facilitating online trading, clearing and settlement operations for commodity futures markets across the country. The Headquarters of MCX is located in Mumbai. MCX is led by an expert management team with deep domain knowledge of the commodity futures markets.

NMCE: National Multi Commodity Exchange of India Ltd. (NMCE) was promoted by Central Warehousing Corporation (CWC), National Agricultural Cooperative Marketing Federation of India (NAFED), Gujarat Agro-Industries Corporation Limited (GAICL), Gujarat State Agricultural Marketing Board (GSAMB), National Institute of Agricultural Marketing (NIAM), and Neptune Overseas Limited (NOL). While various integral aspects of commodity economy, viz., warehousing, cooperatives, private and public sector marketing of agricultural commodities, research and training were adequately addressed in structuring the Exchange, finance was still a vital missing link.

NCDEX:National Commodity and Derivatives Exchange Ltd (NCDEX) is a technology driven commodity exchange. It is a public limited company registered under the Companies Act, 1956 with the Registrar of Companies, Maharashtra in Mumbai on April 23,2003. It has an independent Board of Directors and professionals not having any vested interest in commodity markets. It has been launched to provide a world-class commodity exchange platform for market participants to trade in a wide spectrum of commodity derivatives driven by best global practices, professionalism and transparency. NCDEX currently facilitates trading of thirty six commodities.

**International Commodity Exchanges**

Futures' trading is a result of solution to a problem related to the maintenance of a year round supply of commodities/ products that are seasonal as is the case of agricultural produce. The United States, Japan, United Kingdom, Brazil, Australia, Singapore are homes to leading commodity futures exchanges in the world and some of the International commodity exchanges are : The New York Mercantile Exchange (NYMEX), London Metal Exchange, The Chicago Board of Trade, Tokyo Commodity Exchange (TOCOM) and Chicago Mercantile Exchange (CME) etc.,

**Silver:**

Silver is a soft white precious univalent metallic element that is highly ductile and malleable having the highest electrical and thermal conductivity of any metal. It is found in the metallic state and also in a large amount of minerals mainly in argentite free form and that is why it is called argentum in Latin. Silver has attracted man's fascination for many thousands of years. A major watershed of silver production was the discovery of the New World in 1492, which was followed by the opening of major silver mines in Mexico, Bolivia, and Peru, leading to a rapid rise in the annual world production of silver. This rise, coupled with improved techniques for extracting silver from ore, broadened both the quality and quantity of ore that could be exploited. Later improvements, particularly in the late 19th and early 20th centuries, vastly enhanced the base of silver production and accelerated the exploitation of silver as a byproduct of base-metal mining. Only about 25 percent of cumulative world silver production occurred before the 1770s. Records remain incomplete for the periods before 1900; however they play a critical part in determining cumulative historical production.

Although silver is relatively scarce, it is the most plentiful and least expensive of the precious metals. The largest silver producing countries are Mexico, Peru, the United States, Australia and Chile. Sources of silver include; silver mined directly, silver mined as a by-product of gold, copper, lead and zinc mining, and silver extracted from recycled materials, primarily used photographic materials.

**Basic Information about Silver:**

Symbol: Ag

**Silver Producing and Silver Consuming Countries**

**Silver Producing countries:**

The below-mentioned figures are the silver production figures of the countries. Clearly, Mexico leads the list of silver producing countries. It contributes to about 15% of the world's total production. Already mentioned, only 25% of the world's total production (i.e. 615 million ounces) comes from the primary silver mines and the rest from other sources like refining of other metals and also from scrap recycling. World silver survey done in 1998 depicts that around 152.2 million ounces of silver was separated from the waste for recycling purposes. This percentage of separated silver has improved due to advanced methods of separation. United States is the major silver producing country through scrap and waste followed by Japan.

| | | | |
|---|---|---|---|
| Mexico | Peru | Australia | China |
| Poland | Russia | Kazakhstan | Iran |
| Sweden | Indonesia | Morocco | Argentina |
| Turkey | South Africa | Japan | India |

**Silver consuming countries:**

The countries that are the major consumers of silver are: -

| | | |
|---|---|---|
| United Stated | Canada | Mexico |
| Germany | Italy | Japan |
| India | United kingdom | France |

**Grading of Silver:**

Silver that is found with some percentage of other elements in it is called impure silver. That is why it's graded upon its fineness. According to the Indian standards, silver is graded into six categories

| | | | | | | |
|---|---|---|---|---|---|---|
| Grade | 999.9 | 999.5 | 999 | 970 | 925 | 916 |
| Fineness | 999.9 | 999.5 | 999 | 970 | 925 | 916 |

**Contract specification for Silver Future**

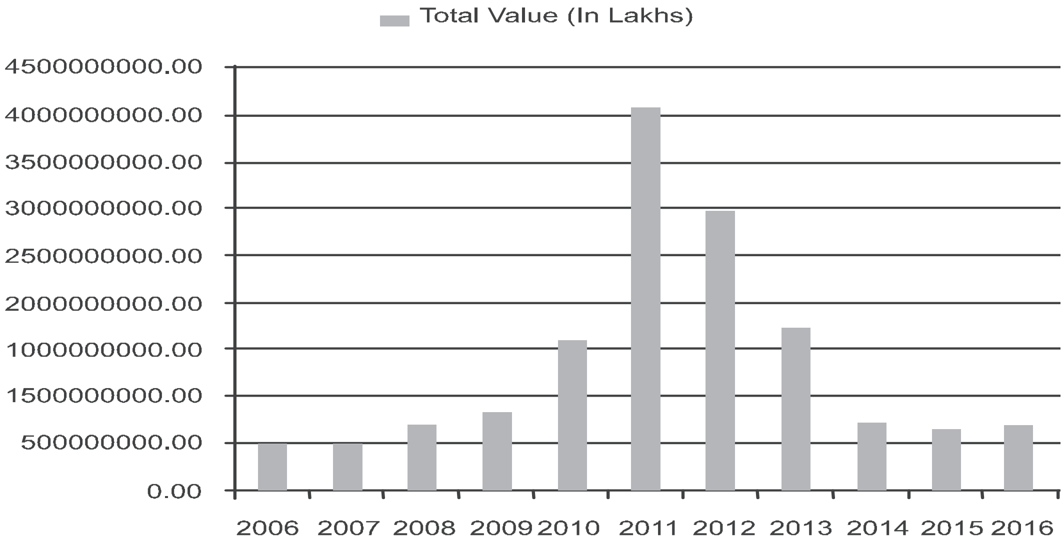
- Trading Symbol:SI
- Trading Unit: 5,000 troy ounces.
- Price Quotation:U.S. cents per troy ounce.
- Trading Hours (All times are New York time)

Open outcry trading is conducted from 8:25 AM until 1:25 PM.Electronic trading is conducted from 6:00 PM until5:15 PM via the CME Globex® trading platform, Sunday through Friday. There is a 45-minute break each day between 5:15PM (current trade date) and6:00 PM (next trade date).

**Price Fluctuations in Silver for last 5 years:**

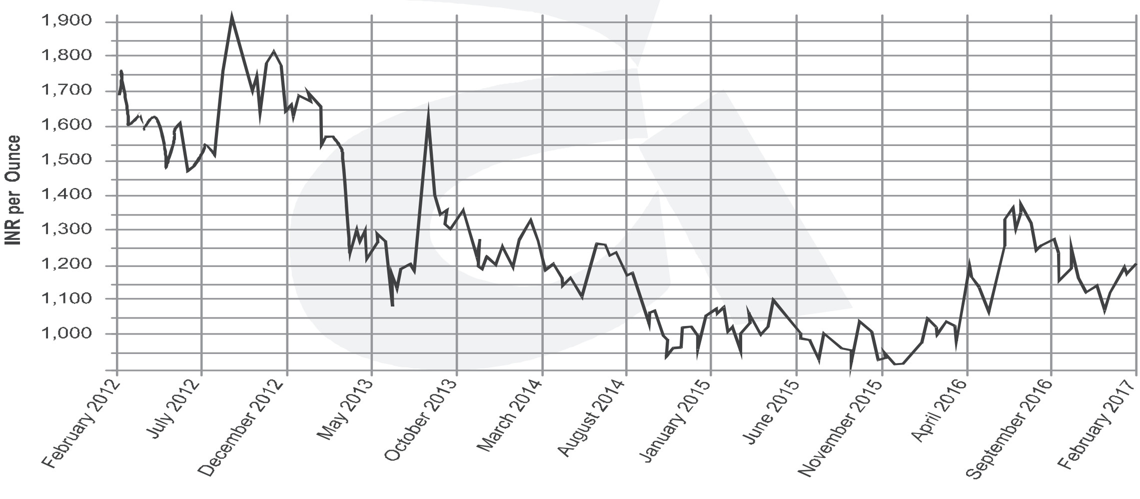
| Year | Traded Contract(In Lots) | Quantity (In 000's) | Unit | Total Value (In Lakhs) |
|---|---|---|---|---|
| 2006 | 9498544 | 284956.32 | KGS | 50607378.39 |
| 2007 | 9183273 | 275498.19 | KGS | 51568068.06 |
| 2008 | 10972676 | 329180.28 | KGS | 70407359.66 |
| 2009 | 11555501 | 346665.03 | KGS | 82891095.67 |
| 2010 | 16440533 | 493215.99 | KGS | 159664842.35 |
| 2011 | 24434544 | 733036.32 | KGS | 408239010.89 |
| 2012 | 17284529 | 518535.87 | KGS | 297774497.73 |
| 2013 | 11754822 | 352644.66 | KGS | 173915829.59 |
| 2014 | 5692481 | 170774.43 | KGS | 71127129.42 |
| 2015 | 5957382 | 178721.46 | KGS | 64865456.59 |
| 2016 | 5572254 | 167167.62 | KGS | 69174486.91 |

Source: MCX India




Source: MCX India

**5 Year Silver Pricces In Indian Rupees (Price per ounce)**




## World Silver Supply and Demand

To document these and other market fundamentals, each year the Silver Institute works with GFMS Limited, of London, a leading research company, to prepare and publish an annual report of worldwide silver supply and demand trends, with special emphasis on key markets and regions. This annual survey also includes current information on prices and leasing rates, mine production, investment and fabrication.

**Supply and Demand of Silver in the world:**

**World silver Supply and Demand**

| (Million ounces) | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Supply** | **917.3** | **890.3** | **908.6** | **916.7** | **1075.2** | **1043.3** | **1006.6** | **988.6** | **1053.3** | **1040.6** |
| **Total Physical Demand** | **936.3** | **959.6** | **1085.1** | **864.2** | **1036.4** | **1121.8** | **1004.6** | **1137.9** | **1131.9** | **1170.5** |
| Physical Surplus/Deficit | -19 | -69.3 | -176.6 | 52.5 | 38.8 | -78.5 | 2 | -149 | -78.6 | -129.8 |
| **Net Balance** | **-136.8** | **-145.5** | **-270.7** | **-89.2** | **-83.3** | **-66.7** | **-115.5** | **-160.2** | **-71.3** | **-112.5** |
| Silver price,$ Per oz. | 11.55 | 13.38 | 14.99 | 14.67 | 20.19 | 35.12 | 31.15 | 23.79 | 19.08 | 15.68 |

Source: World Silver Survey, 2016

**Factors that Influence Silver Prices:**

**1. Industrial, commercial and consumer demand:**

The traditional use of silver in photographic development has been dropping since 2000 due to the growth of digital photography. However, silver is also used in electrical appliances (silver is the highest known conductor of electricity), photovoltaic (one of the highest reflectors of light), clothing and medical uses (silver has antibacterial properties). Other new applications for silver include RFID tags, wood preservatives, water purification and food hygiene. The Silver Institute has seen a noticeable increase in silver-based biocide products coming onto the market, as they explain.

Currently we're seeing a surge of applications for silver-based biocides in all areas like industrial, commercial and consumer. New products are being introduced almost daily. Established companies are incorporating silver based products in current lines - clothing, refrigerators, mobile phones, computers, washing machines, vacuum cleaners, keyboards, countertops, furniture handles and more. The newest trend is the use of Nano-silver particles to deliver silver ions.

The expansion of the middle classes in emerging economies aspiring to Western lifestyles and products may also contribute to a long-term rise in industrial and jewellery usage

**2. Silver supply:**

Silver supply is an important factor influencing junk silver prices. Junk silver suppliers are mostly individuals turning in there and major manufacturing businesses that use silver during their technological process.

**3. The Effect of Silver Stockpiling:**

Silver is one the best conductors of energy which makes it an important component in most electrical devices. It is also a very good reflector of light making it valuable to producers of mirrors, windows, and other glass products. When silver prices rise, large companies that are dependent on the metal tend to horde it. This can further drive up demand, as was the case with palladium. In 2000, the Russian supply of palladium was disrupted causing prices to rise. In response, companies who used palladium in their products began to stockpile the metal. This drove prices up to $1,100/oz from $330/oz previously.

**4. Silver is a Byproduct Metal:**

About 80% of mined silver is gathered as a byproduct of other metals, such as copper, nickel, zinc, and lead. Most of this metal comes from mines outside of the U.S. When the dollar falls against other currencies, the cost for importing these metals rise and demand falls, driving down silver production.

**5. Shorting Silver:**

On the Commodity Exchange (COMEX), the silver short position is very large. In fact, silver is the world's only commodity that has a short position which is larger than both its global production and inventories.

The extent of this position has been created by naked short selling, which means shares are sold without an arrangement or promise of a borrower. This large short position helps to keep silver prices lower than they may be otherwise.

**6. Countries Buying and Selling Silver:**

When countries sell their reserves of silver in the market they increase the supply of silver available.

**7. Mine Production:**

Although the majority of silver is produced as a byproduct of other metals, 20% comes from actual silver deposits.

**8. Interest Rates:**

Most people don't pay too much attention to the price of silver or the consumer price index, and they might not pay too much attention to interest rates. However, they do pay attention when they see prices going up around them. If their grocery bill goes up or if their electric bill goes up they notice that.

This is evident when you look at the statistics of the consumer price index, the price of silver, and also the going rates of interest on the one year and ten year bonds. You see that in periods of time in the early seventies the interest rate was lower than the rate of inflation and so people sensed their money was being devalued and that is kind of the time when you started seeing the steep upward trend in the price of silver. Those conditions of lots of inflation and small interest rates probably had a large impact on how high the price of silver went. our government is currently doing there is a lot of pressure for them to keep interest rates low and there is pressure print up a bunch of money.

**9. Hedge against financial stress**

Silver, like all precious metals, may be used as a hedge against inflation, deflation or currency devaluation. As Joe Foster, portfolio manager of the New York-based Van Eck International Gold Fund, explained in September 2010.

The currencies of all the major countries, including ours, are under severe pressure because of massive government deficits. The more money that is pumped into these economies - the printing of money basically - then the less valuable the currencies become.

**10. Impact of inflation on silver:**

The dollar's downward spiral and concerns about inflation pushed gold and silver higher this week as investors clamored for an alternative store of value.

Gold notched a record high above $1,569 per troy ounce, rising 4.1 per cent on the week.

Silver climbed 3.9 per cent on the week, touching a 31-year peak above $49 per ounce that was just shy of the $50 nominal record reached during a notorious market squeeze in 1980.

Oil also rose, with benchmark ICE June Brent closing at $125.89 per barrel and NYMEX June West Texas Intermediate settling at $113.93 per barrel.

**11. US Dollar**

From our study of the relation between silver and US Dollar we can clearly see that there exists an inverse relationship between silver prices and USD Index. During recession US Dollar is considered a safe haven, people around the world tend to disinvest in commodities and invest into US Dollar. From our analysis, we can clearly see that the prices of precious metals such as silver, palladium, titanium, etc. declines during recessionary periods. The above trend clearly suggests that silver can be used only as a long term hedge against inflation, but it cannot be used in short term as a recessionary hedge.

### 12. Gold Prices

Despite all of silver's fundamental drivers, gold is considered as the primary driver for silver prices. In a bullish environment, speculators tend to be interested in most of the precious metals. So it leads to an increase in the investment demand for silver. Silver having a comparatively smaller market as compared to gold, it does not take much time to drive the prices higher. At the same time when the environment is bearish, investors lose confidence in silver very fast and cause the prices to fall. From the analysis of the trend of the gold-silver ratio, it can be seen clearly that silver has a tendency to follow the prices of gold.

During the subprime crisis when the view was bearish we clearly see the trend that during the days when the prices of gold increased silver also increased. However, it would pace the gain of gold at best. During the days when the gold prices decreased we see that the silver prices plummeted by an even greater margin. Based on our hypothesis we would recommend to buy silver during a recession and to sell during a boom.

### 13. Oil Prices

Historically oil has shown a strong correlation with gold. Gold and silver also seem to have a stable relationship. Based on this it might be logical to conclude that oil and silver should also have a stable relationship. It has been argued that the mining of silver is an energy intensive process and hence as the oil prices rise or fall, the prices of silver would also rise or fall. This however would be over simplification as it undermines various other important factors. There is also another argument that says that silver and oil should have greater correlation than silver and gold as they are industrial elements and the factors affecting their demands would be common. However, contrary to this silver is not a perishable commodity whereas oil is.

Since the 1960's silver and oil have had a 0.7 positive correlation, this is quite strong but not as strong as of gold and oil that have a correlation of 0.8. Our analysis of the silver and oil relationship shows that silver does have a positive correlation with oil during secular commodities bull periods and the secular bear periods.

### 14. Stock Indices

There is certainly some interplay between the fortunes of the stock markets and capital flowing into silver. Silver's appeal as an alternative asset is definitely higher when traditional investments are not faring well. Yet, the relationship between silver and the S&P 500 (SPX) is far more nuanced and complex than merely a direct inverse or even parallel relationship. The SPX is not, and never has been, silver's primary driver.

Running regression across top indices such as S&P 500, Dow Jones, BSE and NSE we see a common pattern emerging. The correlation between silver and the stock markets was low pre-recession. But we see that during the subprime crisis and post it, silver has been highly correlated with the stock markets. This shows the returning demand for investment in silver with the growing confidence in the markets.

### 15. Regulation in Silver Market

In response to various complaints from investors in recent past, CFTC has closely studied the existing controls in the market to prevent manipulation. However, there is no evidence of attempted manipulation as claimed by the complainants. The clear outperformance demonstrated by silver prices when compared to other precious metals in the recent years, shows that silver prices are not artificially depressed. The NYMEX price also trades close to the spot price thus showing that close movements are an indicator of healthy market forces in play.

Moreover, there is a slightly positive relationship between the short futures price and spot silver price, which suggests that larger short futures positions are associated with higher prices. However, still many industry experts believe that the silver market is largely controlled by only a few. These investors are suspected to have enough power to corner the market if they wish to.

## Conclusion

Silver is a major precious metal, valued as a form of currency and as an industrial metal. It outpaced its other commodity counterparts-gold and platinum, growing at a rate of 58% during 2016. The primary factor that has been attributed to this strong growth is the investment driven demand for silver.

Many consider silver as a future substitute for investment in gold. However its high volatility has still remained a question of interest. The volatility can be attributed to multiple factors like gold and other precious metal prices, major stock market indices, large concentrated short position, US dollar, oil, institutional investors and industrial demand.Finally, as the lights continue to go out for the world's reserve currency, the US Dollar; trade wars escalate and threats of nationalization and the monetization of the precious metals become increasing probabilities. All these are critical factors that will impact silver in a negative and positive way - negative for those who hold a sweaty palm of Federal Reserve Notes and positive for those who have decided to own the precious metals.

## References

Bhattacharya, H. (2007). Commodity derivatives market in India. Economic and Political weekly, 1151-1162.

John C. Hull, (1981); Options, Futures, and Other Derivatives;( 5th Edition)

Nissar A. Barua and DevajitMahanta (2012) "Indian Commodity Derivatives Market and Price Inflation" IOSR Journal of Business and Management (IOSRJBM) ISSN: 2278-487X Volume 1, Issue 6 (July-Aug. 2012), PP 45-59

S. Kevin, (2014); Commodity and Financial Derivatives; (2nd Edition)

V. K. Bhalla, (1980); Investment Management Securities Analysis and Portfolio Management; (5th edition).

## Websites:

1. http://www.silverinstitute.org/site/
2. http://www.silverinstitute.org/site/supply-demand/
3. https://en.wikipedia.org/wiki/List_of_commodities_exchanges
4. http://www.investopedia.com/terms/c/commodityfuturescontract.asp
5. http://www.e-futures.com/futures-trading-education.php
6. http://www.moneycontrol.com/gyaan/commodity/basics-of-commodity-trading
7. http://www.goldbullionpro.com/top-10-factors-that-affect-price-of-silver-today/
8. http://ncdex.com/index.aspx
9. https://www.mcxindia.com
10. http://indianmoney.com/how/major-commodity-exchanges-in-india