An Empirical Analysis on Indian Gold Trade Due to The Impacts of COVID-19 and Demonetization

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Abstract- ***This study carries out an empirical analysis on examining the relationship between gold investment in terms of returns and risk from the perspective of National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) Sensitive Indexes. The study is carried out specifically to represent the effect of gold business in Indian stock market before and after the demonetization process. The study is intended to present, whether COVID-19 and demonetization has affected the gold trade in stock exchange market. The study attempts to predict the future gold trade and further presents the measures to be handled, while demonetizing other rupee notes to avoid cash crunch and to have a positive effect on gold trade.***

Indexed Terms- ***Commodity Market, Gold Price, Demonetization, Microeconomic variables, Heteroscedasticity, COVID-19***

I. INTRODUCTION

Historically, the investors used perilous ways in their groups that includes gold investment, since the investment in gold is inversely proportional to the movements in stock market. As there is an advancement in technology, the environment to hinder the buying/selling of gold commodities has reduced to a greater extent to an end user consumer or an investor. Also, there exist several other options to prevent risk by the investors that makes gold a better commodity in market. Comparing with other safer investments like mutual funds, equity, etc. the gold commodity market is considered to be significantly exceptional. Since, it is regarded as one of the safer way of investment and exceptionally it offers long term or short term security compared with other investments. This rising demand is constant over years in the country and it created a huge market for the investors to invest in Gold (Mukhuti 2018).

1.1. Factors affecting the Price of Gold Market

India is considered as one of the largest gold consumers, worldwide, when the annual demand is equivalent to 25% of physical demand. Conventionally, the demand of gold is increasing at the time of wedding or festive seasons that leads to increasing gold prices. Although, the gold demand has a direct influence on its price, there exist several relative factors that impacts prominently the price of gold and the important factors are considered for the present study.

1.1.1 Income and Gold Price

As per the reports published from 1990 to 2020 by the World Gold Council(WGC), there are two factors that are significantly affecting the demand of gold consumer for a longer period of time. These two factors include income (i.e. as the income levels rise, so as the gold demand), and gold price (increase in prices affects the consumption of gold by consumers or investors).

1.1.2 Consumption demand

In India, the gold demand is interlinked with Indian tradition, Indian culture, the desire for beauty and financial protection. According to WGC and Federation of Indian Chambers of Commerce and Industry (FICCI), the investors and consumers of gold in Indian market see it as an opportunity for an adornment and an investment. As per the survey made by WGC and FICCI, merely 80% of the respondents mentioned that the gold can be seen as an investment and 50% of the respondents stated purchasing gold can be seen as an adornment.

1.1.3 Gold and interest rates

As per the industry experts, the gold and its interest rates has a negative association with each other under normal circumstances. Increase in income denotes that the economy is expected to grow strongly, which increases the inflation and hence the gold is considered as a tool for expending the inflation rate. With increasing income, the investors tend to invest on some fixed-investments scheme rather than investing on gold, since gold investment does not yield any returns.

1.1.4 Good monsoon

The demand of rural conditions significantly plays a major role in gold demand in India, since it depends basically on the monsoon seasons. Since, rural economy consumes 60% of the consumption of gold in India, where the entire consumption is of 800-850 tonnes. Hence, consumption of gold depends greatly on monsoon, since better crop yield persists, higher is the chances of investing on gold for assets creation by the rural. On the other hand, the rural demands to sell gold in case of deficient monsoon for generating their own income.

1.1.5 Impact of rupee-dollar equation

In Indian market, the rupee-dollar equation plays a major role, however, it has a lesser influence on the prices of gold. Since, the larger imports on gold ensures that dollars has lesser relationship on impacting the prices of gold even if the rupee inflation increases. However, the prices of gold is expected to increase likely with the weakening of rupee against dollar and this dents the gold demand in India.

1.1.6 Correlation with other asset classes

Some economists believe that investing on gold is considered to be an effective portfolio diversifies, since it provides negative correlation with other assets. There exists not statistical significant correlation between the gold prices and other mainstream asset. On other hand, certain economist suggests that as the equities are under inflation or it falls rapidly, the demand for gold or gold prices are not affected and it possess a negative correlation. The investment in gold ensures that a consumer is not affected from volatility since the macro- and micro-economic factors affecting the returns from major assets does not directly influence the gold prices.

1.1.7 Geo political factors

During the geopolitical turmoil and at the time of crisis, the gold usually performs well. The gold assets will then act as a mental support to the consumers or investors and on the domestic market. Likewise, at the time of crisis, the gold investment acts as a parking fund and it holds a negative impacts rather than other assets, since it possess positive impacts at the time of crisis.

1.1.8 Weakening dollar

The dollar and gold market under normal conditions attains an inverse relationship among them. Since, the gold available in international market is of a dollar denominated one and inflation in dollar increases the prices of gold and vice versa. The inverse association between gold and dollars is due to two major reasons: At first, increase in currency value of other countries with declining prices of dollar. This increases the price of gold, since the gold commodity demand increases with declining dollar prices. Secondly, the weakening dollar prices makes the investors to invest on alternative investments rather than investing on gold and they treat gold as a marginal investment during the time of weakened dollar prices.

1.1.9 Gold and inflation

Conversely, with increasing rates of inflation, the Indian currency starts losing its value and the consumers or investors prefer investing in gold rather than holding the inflated money. If the inflation stays for longer time period, gold acts as an instrument to withstand the inflationary situation. This nominally increases the prices of gold even in inflationary situation.

1.1.10 Future gold demand

The demand of gold across global market is 1000 tonnes as per the estimates than its normal supply. Since, there exist very few capacity of mining, the global market considers recycling of gold. Such a meagre quantity of gold supplies is considered as yet another factor of increasing gold rates. The other factor that affects the prices of gold is the inflation in world economy.

1.1.11 Stock Market

In recent times, the gold and oil prices have experienced significant alterations in the global

market. The price of crude oil is increasing or decreasing, meanwhile, the effects on gold price is considered either positive or negative in India. For instance, the price of gold has a positive influence on stock market trade (Najaf, K., & Najaf, R. 2016). Hence, the article comprehensibly investigates the movements of stock market and several other factors that impacts the prices of gold and its related investments in India. This study specifically considers the impacts of gold prices on the stock prices of leading Indian Stock Markets, namely BSE and NSE. Further, there is an assumption or myth that there exist a substitution between the gold and stock exchange market in relation with the investments made by the investors (Tursoy, T., & Faisal, F. 2018).

1.1.12 Protection against volatility

After the financial crisis happened in 2008, globally, the capital flows of NSE-Nifty and BSE-Sensex is ceaselessly better and it has eliminated the controls of international capital arose due to the economic liberalization. However, the investment decisions seems to be risky due to unpredictable stock market volatility returns. Since then, the volatility has raised the bottomless insecurity on investing in stock market particularly in BSE- Sensex /NSE- Nifty and this has greatly influenced the gold demand (Bhuyan and Dash, 2018).

Indian consumers or investors tend to buy or invest on gold to secure them from uncertainty and volatility. Indian households consider gold as a major physical assets and preference is high when comparing with other assets, since this asset will give hand, if the other assets loses its value. Featuring the attraction of gold in the form of a physical asset in good/bad times, most of the Indian investors tend to purchase gold, even if the domestic Indian economy is in recession or growing.

Depending on the above context, the article finds the relationship between the Indian stock market indexes, namely, BSE-Sensex and NSE-Nifty, and the gold price. Also, the study reveals the relationship between various other factors (refer section 1.1)that affects the prices of gold. The study reveals whether these factors exhibit a positive or a negative association with the gold prices. It is found that the past inverse relationship between the gold and stock market prices has significantly changed over time.

II. LITERATURE REVIEW

Najafabadi, (2012) studied the impacts of oil on gold prices through econometrical procedures in Tehran Stock Exchange between 1998 and 2011. ARIMA-Copula is used as a model for study and these two factors namely oil and gold are the two factors that prominently affects the economy. The findings reveal that there exist no significant direct relationship between TSE and gold price and it is indirectly influenced through oil. Further analysis shows that there is not independent relation between gold price and volatility in oil price and Clayton copula.

Pule, B. P. (2013) examines the benefits associated with gold investments in terms of two factors like risk and returns. The study finds the association between the macroeconomic variable and gold price. The analysis using a multiple regression model finds that the price of gold depends entirely on dollar exchange rate and gross domestic product (GDP).

Sindhu, D. (2013) studied the impacts of certain factors that impacts the gold price in India. The factors considered for the study includes: Crude oil prices, INR exchange rate w.r.t. US dollar, inflation rate and repo rate. The study emphasis the relationship between these factors and the gold prices. The results reveal that the gold price is inversely proportional to the dollar price. Also, it is found that crude oil has limited impacts on gold price. The gold price is dependent on inflation rate in terms of positive correlation and it is interdependent on crude oil price.

Prakash, P., & Sundararajan, S. (2014) examine the relationship between silver and gold between 2001 and 2013. The study considers various factors (consumer goods demand, inflation, dollar value, gold reserves, borrowing rate, monetary policy, speculation, growth in demand, supply and increasing demand for traded paper backed products) relative to silver that affects the gold price and the study examines a non-existence of stable relationship between silver and gold in terms of its currency rate. It is found from the study that there exists a significant evidence that these metals offer an attractive investment. The study also forecasts the

economic conditions that drives the prices apart. The study foresees their relationship in commodity market. The findings reveal that there exists a positive correlation between silver and gold and the price of gold has 97% dependence on silver prices.

Najaf, K., & Najaf, R. (2016) studied the impacts of crude oil prices influencing the gold price in BSE. The findings reveal that there exist a no long relationship between BSE and two dependent variables.

Shaique, M., et al. (2016) studied the relationship between gold price and Karachi Stock Exchange 100 index between 1993 and 2014. Several econometric tests are carried out to find the long-run relationship between gold price and Karachi Stock Exchange 100. The findings reveal that gold price and Karachi Stock Exchange 100 index has close relationship and the influence on gold price is affected by previous timeline and the fluctuation rate.

Afsal, E. M., &Haque, M. I. (2016) found that the price of gold has a non-linear dependency on Saudi Arabian stock market. The study employs GARCH model to observe the persistence level of volatility. The factors considered for the study includes spillover pattern, leverage effect, absolute returns, risk-premium effects and power transformation factors, etc. The findings reveal that there exist no dynamic relationship between the stock prices and gold prices.
Kvietkauskienė, A., &Plakys, M. (2017) studied the impacts of stock market returns on various indicators. The findings reveal that there is no significant relationship between silver and gold prices on stock market return during economic uncertainty. It is seen that as the prices of stocks falls, the gold prices rise and hence gold is considered to be safer investment during the time of inflation.

Mechri, N., et al. (2018) studied the relationship between exchange rate volatility and the stock market returns to control the portfolio risk level. Also, it identifies the impacts of relative prices uncertainty and exchange rate w.r.t the stock markets price fluctuations on two different countries belonging to MENA zone. The volatility of variables is measured using GARCH model and the exchange rate impacts and fluctuations in relative gold prices is measured using multiple regression model w.r.t stock market volatility. The findings reveal that there is a significant effect on stock market fluctuations, as well as the volatility of the Gold and the oil prices, which are significant.

Mukhuti (2018) used econometric study to find the influence of stock market indices on domestic gold prices between 2008 and 2018. The study collects the data from WGC, RBI, BSE and NSE databases. The findings reveal that BSE and NSE stock indices has positive correlation on gold prices. The Granger causality test reveals that there exists no causality between NSE, BSE and its returns with Gold price.

Tursoy, T., & Faisal, F. (2018) investigates the relationship between long run and short run interaction between gold prices, stock prices and crude oil in Turkey 1986 and 2016. The integration is estimated using autoregressive distributed lag finds that gold and stock prices have a negative relationship in terms of short-run and long-run results and there exist a positive direct relationship between crude oil and stock prices.

III. RESEARCH DESIGN

The research design provides the data considered for the present study, problem statement, objectives of the study and the statement of hypotheses.

3.1 Problem Statement

Gold investment in India is less relative to an investor than a consumer, even though it is considered to be a superior investment type apart from fixed deposit, government bond and mutual fund. Since most of these are affected with financial crisis or inflation or recession. Hence, many investors tires to seek a way that protects them from the threat of inflation and other degrading economic conditions. The WGC stated that there is a dramatic growth in investing on gold, since it not affected by inflation or other problems. However, the investment related to gold commodities is of less interested one among the Indian investors. The price of gold is not a stable one and it is highly volatile than other supplies. However, in long run the prices of gold is considered to be upward shifting and the price is appreciated. There are several factors that impacts the prices of gold during the time of crises and the present study analyses these microeconomic

variables and provides a solution based on the analysis being carried out.

3.2 Research Questions

The study intends to find the appropriate answers to the following question based on the aforementioned problem statement.

Question 1: Is there exist any relationship between gold prices and microeconomic variables in Indian economy?

Question 2: If so, do the microeconomic variables have any positive or negative impacts on gold prices post crisis period?

Question 3: Do the microeconomic variables impact the prices of gold for short or long term post crisis period?

3.3 Objective of the study

1. To analyse the behavior of microeconomic variables (Income and Gold Price, Consumption demand, Gold and interest rates, monsoon, rupee-dollar equation, correlation, geo political factors, weakening dollar, gold and inflation, future gold demand, behavior of stock market and volatility behavior) and its association (positively or negatively) with the gold price with respect to Indian economy post-crisis period (e.g. Demonetization).
2. To examine the association i.e. long term relationship or short term relationship between the microeconomic variables and the gold price with respect to Indian economy post-crisis period (e.g. Demonetization).

3.4 Hypotheses of the Study

Depending on the objectives, the proposed study formulates the following hypotheses.

H_{01}: Microeconomic variables do not have stationarity during the chosen period (8 Nov 2016 – 30 Dec 2016).

H_{02}: There is no homogenous relationship between microeconomic variables and prices of gold during post crisis period.

H_{03}: Microeconomic variables do not granger cause prices of gold during post crisis period and vice versa.

H_{04}: There is no significant relationship between gold price and microeconomic variables.

IV. RESEARCH METHODOLOGY

4.1 Data of Study

In addition, the facts and shapes, outlines and findings highly developed in comparable previous studies and the government publications and reports are also used to supplement the secondary data.The present study is completely based on the secondary data collected from several databases that includes gold database (WGC) (refer Fig 1) (WGC Website), economy (RBI) database and stock databases (NSE and BSE).

Figure 1: Gold price chart from 2016 to 2021

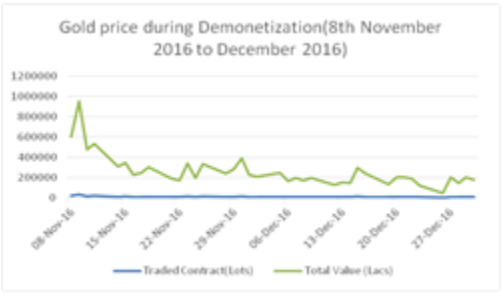

Fig 2 :During the Demonetization Period (8 Nov 2016 – 30 Dec 2016)

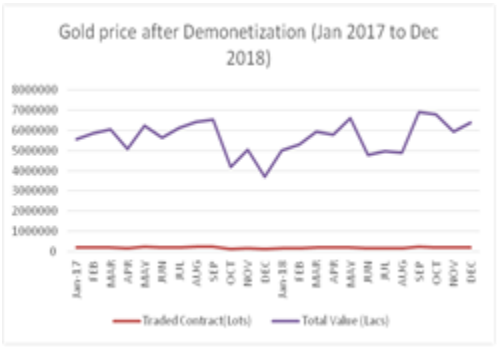

Fig 3 :After the Demonetization period (2 Jan 2017 – 30 Dec 2018)

Figure 4: The variation of prices between Nov 2016 and Dec 2018 in terms of INR, USD and EUR (Source:https://www.gold.org/goldhub/data/gold-prices, Collected on 1.1.2019)

4.2 Period of Study

The data is collected between the period of January 2016 to December 2021 is considered as the period of study.

4.3 Nature of Study

The main aim of the study is to identify the microeconomic factors influencing the gold investment in India. The causes and effects are analyzed using the proposed study and hence the study can be considered as an analytical research.

4.4 Need for study

The study analyses the reasons affecting the adoption of gold as investment by the investors in their portfolio.

4.5 Data Analysis

The study includes the details of gold trade in Indian trade market from the period of 2016 – 2021. The study specifically studies various factors (refer section 1.1) that impacts the prices of gold trade in Indian Stock Market. A case study is conducted on the impacts or association gold trade after the demonetization of rupee notes at 2016 in India. The study uses standard deviation, correlation and regression analysis tools to analysis the gold trade economy.

4.6 Limitations of the Study

- The study is confined to a very shorter period that covers the post demonetization period in India.
- The study focus only on microeconomic factors and consideration of macro-economic factors are very much limited or it is said to have an indirect relationship with macroeconomic factors.

4.7 Variables for the Analysis

Reasonable care has been exerted to select the variables for the analysis. This study predominantly used variables which were extensively used in the previous research works.

Table.1. Variables used in the analysis

Variables used in the analysis	Expected Sign
Dependent Variable	
Gold Price	
Independent Variable	
Income and Gold Price (IGP)	+
Consumption demand (CD)	+
Gold and interest rates (GIR)	-
Monsoon (M)	+/-
Rupee-dollar equation (RDE)	+/-
Correlation with other assets (COA)	+
Geo political factors (GPF)	+
Weakening dollar (WD)	+
Gold and inflation (GI)	+
Future gold demand (FGD)	-
Behavior of stock market (BSM)	+/-
Behavior of volatility (BV)	+

V. RESEARCH INSTRUMENTS

The study provides the investors, the insights of investing in gold in India even if the government decides to demonetize other rupee notes. Also, it tends to provide the influence factors and relationship of various factors over the prices of gold before and after the demonetization process. Since, the proposed study uses several variables to assess the gold price, an econometrics analysis can be considered for analyzing the associations between the microeconomic variables and gold price. An overview of the techniques used in present study is given below:

5.1 Stationarity

A preliminary test known as Stationarity is applied prior the evaluation using major econometrics tools. It is seen that the time series data used for analysis is

stationary i.e. it should be invariant w.r.t time. Upon non-stationarity of data leads to spurious regression. Initially, the proposed method uses unit root test to check the presence of stationarity among the chosen variables. However, the data considered for the study may not be stationary. Hence, the stationarity among the chosen variables are ensured using natural logarithms. If the time series data has a unit root, then the data is non-stationary and vice versa. The present study uses Augmented DuckyFuller (ADF) to check the presence of stationarity.

5.2 Granger Causality Test

Usually in non-stationarity data, the causality is tested. The causality relationship between the events is checked, especially, if there is a change between the events. This test is carried out between the endogenous variables and exogenous variables. It predicts the endogenous variable movement w.r.t exogenous variables and further senses the short term relationship between the variables in a predominant way. It further represents the unidirectional or bidirectional causality between the variables considered for study.

VI. ANALYSIS AND INTERPRETATION

The Figure 1 shows the results obtained after the Normality test. The presence of normality in the given data set is observed in terms of Skewness, Kurtosis and Jarque-Bear Statistics. Finally, the results from Figure 1 shows that the data is distributed normally.

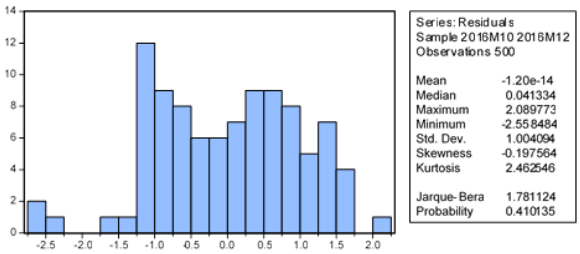

Fig.1. Results of Normality Test

The presence of Heteroscedasticity in normalized samples are observed using ARCH test and the results indicate that the normalized datasets has no traces of Heteroscedasticity that implies that the data residual is distributed identically.

Table.2. ARCH Test to check the Heteroscedasticity

F-statistic	Obs*R^2	Prob. F(3,89)	Prob. Chi-Square(3)
0.249115	0.512314	0.7800	0.7740

Table.3. Breusch-Godfrey Serial Correlation (BGSC) LM Test to check the auto correlation problem

F-statistic	Obs*R^2	Prob. F(2,75)	Prob. Chi-Square(2)
3.037498	6.968543	0.0539	0.0307

6.1 Probs from chi-square with 1 df.

The presence of auto correlation in the model is tested using (BGSC) LM Test in the given model. The results of (BGSC) LM Test shows that there exist an autocorrelation problem at lag 3. Since most of the analysis uses 3 lags w.r.t AIC. Hence, the study variables are considered for further analysis.

Table.4. Unit Root Test between gold price and Macroeconomic Indicators

Variables	sfsdfsd	ADF Test		
		Level	First Difference	Order of Integration
Gold Price		-7.121063	-10.07207	I(0)
Income and Gold Price (IGP)	+	-1.374208	-12.6767	I(1)
Consumption demand (CD)	+	-1.706908	-9.119686	I(1)
Gold and interest rates (GIR)	-	-2.971763	-7.807299	I(0)
Monsoon (M)	+/-	-1.170767	-8.297740	I(1)

Rupee-dollar equation (RDE)	+/-	-1.618976	-9.996703	I(1)
Correlation with other assets (COA)	+	-1.980319	-9.912497	I(1)
Geo political factors (GPF)	+	-10.01449	-11.40642	I(0)
Weakening dollar (WD)	+	-1.121545	-7.215454	I(1)
Gold and inflation (GI)	+	-7.012546	-10.12423	I(0)
Future gold demand (FGD)	-	-10.43435	-9.134345	I(0)
Behavior of stock market (BSM)	+/-	-1.365464	-8.169482	I(1)
Behavior of volatility (BV)	+	-1.484562	-7.544285	I(1)

The Table 4 shows the results of ADF unit root test. The considerations are made such that the microeconomic indicators is stationary, which is checked using ADF unit root test. The result shows that the variables both endogenous and exogenous are found to be stationarity at the initial difference.

The null hypothesis rejection against the positive hypothesis shows that the Gold Price, GIR, GPF and FGD are considered to be stationary and hence it is integrated to an order of 0, I(0). However, the remaining exogenous variables are also stationary and hence it is integrated to an order of 1, I(1).The results are validated further by considering the initial difference of the given time series data and this ensures data to be stationary.

Table.5. Granger Causality test between gold prices and Macroeconomic Indicators

Null Hypothesis	F-Statistic	Prob. Value
IGP does not Granger Cause Gold Price	0.57039	0.9575
Gold Price does not Granger Cause IGP	1.13031	0.3655
CD does not Granger Cause Gold Price	2.75699	0.0033
Gold Price does not Granger Cause CD	0.37977	0.9776
GIR does not Granger Cause Gold Price	0.91553	0.5727
Gold Price does not Granger Cause GIR	1.60559	0.1075
M does not Granger Cause Gold Price	1.22756	0.2901
Gold Price does not Granger Cause M	0.79907	0.6977
RDE does not Granger Cause Gold Price	2.23035	0.0175
Gold Price does not Granger Cause RDE	0.95517	0.5526
COA does not Granger Cause Gold Price	0.35702	0.9912
Gold Price does not Granger Cause COA	0.57727	0.9019
GPF does not Granger Cause Gold Price	2.16565	0.0221
Gold Price does not Granger Cause GPF	0.92279	0.5651
WD does not Granger Cause Gold Price	0.16569	0.5124
Gold Price does not Granger Cause WD	1.53128	0.9122
GI does not Granger Cause Gold Price	0.00026	0.2251
Gold Price does not Granger Cause GI	0.19729	0.3154
FGD does not Granger Cause Gold Price	0.55448	0.2154
Gold Price does not Granger Cause FGD	0.13893	0.5879
BSM does not Granger Cause Gold Price	0.05258	0.7854
Gold Price does not Granger Cause BSM	0.00660	0.8421
BV does not Granger Cause Gold Price	0.21426	0.2454

Gold Price does not Granger Cause BV	0.60718	0.2187

The Table.5 shows the Granger Causality test results between gold prices and Macroeconomic Indicators. This is a hypothesis test to find the times series variable is predicting the other variable movement in short run.

CONCLUSION

The study shows that the gold price is considered as a vibrant element in the growth of Indian economy. The results are analyzed in terms of several microeconomic variables on gold prices after the crisis period starting from January 2017. The results reveal that the dataset is normalized and it is free from the problem of Hetroscedasticity. The ADF test shows that the gold price and the microeconomic variables are likely to be stationary and it is considered suitable for econometric analysis. Hence, it is concluded that investors can invest on gold, where the outcomes are considered profitable and it is not affected by any influential factors like inflation, crisis or demonetization. The special case in this study on demonetization has boosted the gold investment and lead to heavy demand of gold in Indian market during post crisis period.

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