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BSE Sensex and BSE Auto Index Analysis Study

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Abstract

This study explores the BSE Sensex and BSE Auto Index within the framework of capital markets. Capital markets, defined as long-term debt and equity securities trading platforms, are critical for directing wealth towards productive use. Regulatory bodies like SEBI, BoE, and SEC oversee these markets, safeguarding investors. Transactions are managed by financial institutions, yet public access exists, fostering a diverse ecosystem. Primary markets involve fresh securities issuance, with governments and corporations as key participants. Secondary markets enable existing securities trading, boosting investor confidence. Our analysis focuses on BSE Sensex and BSE Auto Index, two vital indices in the Indian financial sphere. These indices reflect the performance of major stocks, providing insights into market trends. Our study aims to discern patterns, fluctuations, and correlations within these indices, shedding light on the broader economic landscape. We seek to provide meaningful investing insights by analyzing historical data, identifying key drivers, and applying statistical methods.

Keywords: Capital markets, BSE Sensex, BSE Auto Index, regulatory oversight, investment insights

INTRODUCTION

As contrast to a money market, where short-term debt is purchased and sold, a capital market is a financial market where long-term debt (over a year) or equity-backed securities are bought and sold. Capital markets channel savers' wealth to businesses or governments that can invest it for the long term and put it to constructive use over the long run. [a] Financial watchdogs like the Securities and Exchange Commission (SEC) of the United States, the Bank of England (BoE), and the Securities and Exchange Board of India (SEBI), among others, oversee capital markets to protect investors against fraud [1].

Although certain transactions on capital markets can be viewed directly by the public, most are administered by organizations in the financial industry or the treasury departments of governments and businesses. For instance, even though individual bond sales only account for a relatively tiny part of total bond sales, anybody in the US with internet connection may establish an account with Treasury Direct and use it to purchase bonds in the primary market. Many private companies provide browser-based services that enable customers to buy securities on secondary markets, sometimes even bonds [2]. These systems number in the tens of thousands, although the bulk only cover a small percentage of the world's financial markets. Governmental organizations, investment institutions, and stock exchanges all host the systems. The systems are geographically dispersed throughout the world, although the majority of them are located in important financial hubs like London, New York, and Hong Kong [3].

A primary market or a secondary market may make up a capital market. Investors can purchase new stock or bond offerings in a primary market, typically through a procedure known as underwriting. Governments (which may be

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municipal, local, or national) and private organizations (companies) are the principal institutions attempting to raise long-term financing on the major capital markets [4]. Although firms routinely issue both bonds and stock, governments only ever issue bonds. Pension funds, hedge funds, sovereign wealth funds, as well as less frequently affluent individuals and investment banks trading on their own account, are the main entities that buy the bonds or stocks. Existing securities are purchased and sold by investors or traders in the secondary market, typically over-the-counter, on an exchange, or somewhere else. Investors in primary markets are more inclined to invest when secondary markets are there because they are more likely to be able to quickly sell their investments if the need arises [5].

A second significant distinction is made between the bond markets (where investors become creditors) and the stock markets (for equity instruments, also known as shares, where investors obtain ownership of firms) [6].

STOCK EXCHANGE IN BOMBAY

Prem chand Roych and created the Bombay Stock Exchange. He was a powerful industrialist in Bombay during the nineteenth century. The Cotton King was a stockbroker who amassed wealth and gained notoriety. The Big Bull is also known as the Bullion King. Additionally, he established the BSE, formerly known as the Native Share and Stockbrokers Association. Although Dalal Street and BSE Ltd are now closely related, this was not always the case. The original stockbroker meetings were held in far less developed settings in the 1850s under banyan trees in front of the Town Hall, where Horniman Circle is now [7]. Ten years later, near the intersection of Meadows Street and what is now known as Mahatma Gandhi Road, the brokers changed their location to another patch of trees, this time under banyan trees. As the number of brokers grew, they were forced to relocate, but they invariably spilled out onto the streets. The brokers finally secured a permanent location in 1874, one they could figuratively call their own. A fitting name for the new location was Dalal Street (Brokers' Street).

The Bombay Stock Exchange is the oldest stock exchange in Asia. It began in 1855 when 22 stockbrokers gathered in front of Mumbai's Town Hall under banyan trees. These meetings frequently moved locations to accommodate an expanding number of brokers. In 1874, the company moved to Dalal Street, and the following year, they received official recognition as "The Native Share & Stockbrokers Association."

On August 31, 1957, the Indian government first enacted the Securities Contracts Regulation Act, officially recognizing the BSE as the first stock exchange. The exchange relocated to the Phiroze Jeejeebhoy Towers on Dalal Street in the Fort neighborhood in 1980 The S&P BSE SENSEX index was created in 1986 and provided the BSE with a way to assess the overall performance of the exchange. The BSE opened its derivatives market in 2000 by trading S&P BSE SENSEX futures contracts using this index as a benchmark. In 2001 and 2002, S&P BSE SENSEX options and equity derivatives were developed, enhancing the BSE's trading environment.

The Bombay Stock Exchange, which formerly traded on an open outcry floor, transitioned to an electronic trading system created by CMC Ltd. in 1995. This move was performed by the exchange in around 50 days. The daily order capacity of the automated screen-based trading platform BSE On-Line Trading (BOLT) is 8 million. The BSE also introduced BSEWEBx.co. into allow investors from around the world to trade on the BSE platform. is a centralized exchange-based internet trading platform. As of May 3, 2017, the BSE share, which is traded on the NSE, only had Rs. 999. The BSE has since raised money by issuing shares. The BSE joined the UN Sustainable Stock Exchange project in September 2012 and is now a partner exchange. BSE introduced India INX on December 30, 2016 INX is the abbreviation for India's first international exchange. BSE introduces contracts for gold and silver commodity derivatives. The 30 well-established and financially sound companies listed on the Bombay Stock Exchange make up the 30 companies that make up the free-float market-weighted BSE SENSEX

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stock market index It is also known as the S&P Bombay Stock Exchange Sensitive Index or the SENSEX as listed in Table 1. It is also known as the S&P Bombay Stock Exchange Sensitive Index or the SENSEX. The daily publication of the S&P BSE SENSEX since January 1, 1986, is regarded as the pulse of the Indian stock markets. On April 1, 1979, the SENSEX's base value was set to 100, with the base year being 1978–79. On July 25, 2001, BSE unveiled DOLLEX-30, a SENSEX derivative that is dollar-linked. The whole market capitalization of the SENSEX was around US$760 billion (or 37% of GDP) as of September 25, 2017, while its free-float market capitalization was US$419 billion (or US$30,094.2286 billion). Due to the growth of sectoral indexes including BSE PSU, Bankex, and BSE-TECk, the Sensex 30 Index's share of the BSE market capitalization decreased from 49% to 25% between 2008 and 2012 [8].

Table 1. BSE SENSEX constituents.

Scrip code	Company
500820	Asian Paints Ltd
532215	Axis Bank Ltd
532977	Bajaj Auto Ltd
500034	Bajaj Finance Ltd
532454	Bharti Airtel Ltd
533278	Coal India Ltd
532281	HCL Technologies Ltd
500180	HDFC Bank Ltd
500182	Hero MotoCorp Ltd
500696	Hindustan Unilever Ltd
500010	Housing Development Finance Corp
532174	ICICI Bank Ltd
532187	IndusInd Bank Ltd
500209	Infosys Ltd
500875	ITC Ltd
500247	Kotak Mahindra Bank Ltd
500510	Larsen & Toubro Ltd
500520	Mahindra & Mahindra Ltd
532500	Maruti Suzuki India Ltd
532555	NTPC Ltd
500312	Oil & Natural Gas Corp Ltd
532898	Power Grid Corp of India Ltd
500325	Reliance Industries Ltd
500112	State Bank of India
524715	Sun Pharmaceutical Industries Ltd
532540	Tata Consultancy Services Ltd
500570	Tata Motors Ltd
570001	Tata Motors Ltd DVR
500470	Tata Steel Ltd
500295	Vedanta Ltd
532648	Yes Bank Ltd

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AUTOMOBILE SECTOR AND STOCK MARKET

Indian Automobile sector stocks have emerged as one of the leading segments in the stock market as they are more attractive and regularly traded stocks in the largest and oldest Bombay Stock Exchange (BSE) in Asia. The Sensex is the first and foremost benchmark index in 1986, comprising the stocks of thirty blue chip companies of all sectors [9]. There were four automobile companies in the BSE-Sensex in 1986, namely Cummins, Mahindra & Mahindra, Hindustan Motors and Tata Motors which are proxy for auto sector stocks. Considering the importance of auto stocks, BSE has formed an index 3.

Exclusively for auto stocks, named S&P BSE Auto as shown in Table 2. The index was created in August 2004 using a list of the top stocks in the auto industry. At present fourteen companies are listed in S&P BSE Auto [10].

Table 2. BSE AUTO INDEX Constituents.

Scrip code	Company
500877	Apollo Tyres Ltd
500477	Ashok Leyland Ltd
532977	Bajaj Auto Ltd
502355	Balkrishna Industries Ltd
500493	Bharat Forge Ltd
500530	Bosch Ltd
500480	Cummins India Ltd
505200	Eicher Motors Ltd
500086	Exide Industries Ltd
500182	Hero MotoCorp Ltd
500520	Mahindra & Mahindra Ltd
532500	Maruti Suzuki India Ltd
517334	Motherson Sumi Systems Ltd
500290	MRF Ltd
500570	Tata Motors Ltd
532343	TVS Motor Co Ltd

OBJECTIVES OF STUDY

- To study the concept of BSE SENSEX & AUTO Index.
- To analyze the market volatility of BSE SENSEX & AUTO Index in the last 10 years from January 2010 to December 2019.
- To find the co-relation between BSE SENSEX & AUTO Index based on the 10-year data from January 2010 to December 2019.

Literature Review

- *Latha Ramchand and Raul Susmell (1998):* they investigated if correlations across the main stock markets are stronger when markets are more volatile in their study, "Volatility and Cross Correlation across Major Stock Markets." Additionally, they found that when the US market is in a high variance condition as opposed to a low variance regime, correlations between the US market and other global markets are often 2 to 3.5 times greater.

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- *Aggarwal et al. (1999):* studied the circumstances that led to significant fluctuations in volatility in developing markets. Events surrounding the time when volatility changes occurred were then detected, along with both increases and decreases in variance. They discovered that local events were mostly responsible for volatility changes. Emerging market volatility was high, and changes in volatility are correlated with significant country-specific political, social, and economic events.
- *M T Raju and Anirban Ghosh, (2004):* In their research paper "Stock Market Volatility - An International Comparison," the authors draw the conclusion that established markets continue to offer good returns with little volatility over an extended period of time. With the exception of China and India, all other nations had low returns among earning markets. India, which has a lengthy history, and China, which has a recent past, both provide high returns comparable to those offered by the US and the UK, but both have more volatility. The amount and pattern of stock return volatility of the Indian stock market during the final decade of the previous millennium, that is, from 1990 to 2000, were studied by Kaur (2004) and were reported in the article Time Varying Volatility in the Indian Stock MarketThe data was gathered from the two most well-known spot price indexes, the BSE Sensex and the S&P CNX Nifty, and their volatility was assessed. It is discovered that 1992, 1990, and 2000, in that order, saw the highest levels of stock market volatility. After 1992, it saw a steep decline until 1995, when it then began to rise once more. Findings based on daily as well as monthly returns support this conclusion.
- *Batra (2004):* When the GARCH model was used to analyze the time-varying pattern of stock market volatility in India, it was discovered that the liberalization of the market had no direct effects on the volatility of stock returns. Kaur (2004) reported significant correlation in daily returns of SENSEX and Nifty and found high volatility in the months of February and March. Karmakar (2005) found strong evidence of time varying volatility and low volatility clustering in the Indian Capital Market.
- *Banerjee et al. (2006):* investigated the presence of long-term memory in the stock returns in India and reported long memory in its conditional variance. But this study did not find the leverage effect. Joshi et al. (2008) successfully explored the movements of stock market volatility of BSE and NSE. Goudcarzi et al. (2011) examined the impact of both good and bad news during the financial crisis of 2008–2009 on the volatility of the BSE 500 stock index and came to the conclusion that by using the EGARCH and TGARCH models, the negative news in the Indian market increased volatility more than the good news. SomSankar Sen and others. (2012) in their study found that the returns were serially correlated and volatility clustering was present during the period of study. Their findings demonstrate the market's presence of news asymmetries and the leverage effect.
- *Rakesh H M (2014):* A Study on the National Stock Exchange's FMCG and Auto Indices' Volatility. to determine if the mean values of the indices differ in any way. It demonstrates that these indices' mean values vary.
- *Neeraj Gupta & Anurag Singh Gurjar (2014) A study of systematic risk with reference of selected companies*: The study tells that the beta coefficient measures the relative systematic risk of an asset. Beta greater than one indicates more systematic risk than average, asset with greater betas implies greater systematic risk as well as greater expected return. .
- *Manek Hetal, Shah Bhavya:* Performance Analysis of BSE Realty and BSE Auto Indices with USD/INR With the importance of investing in securities growing, a sound plan for profiting from market fluctuations will ensure investors' returns. Return on securities is entirely depending on separate interest of investor towards the stock market. The study's principal conclusions concern the real estate and automotive industries. The investors will be able to examine comparable events that will occur in the market with the aid of this study as well. Regarding the study's basic hypothesis, it is evident that the stock markets do have an influence on one another.
- *Andersen, T et al. (2006):* used either historical simulation or risk metrics to assess the present market and industry risk management techniques. The findings indicate that better outcomes may

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be attained by measuring and modeling the portion of realized volatility that can be attributed to "jumps" in the pricing process independently using what are known as realized bi-power variation measures.

- *Andrew Ang et al (2006):* evaluated how the cross-section of stock returns priced overall volatility risk. They discovered that the average returns on equities with strong sensitivity to changes in overall volatility are poor. The average returns on stocks with strong idiosyncratic volatility are pitifully low. According to Andrew Ang et al. According to a study from 2006, the average rate of return on stocks with the greatest potential for loss is higher than the average rate of return on businesses with the smallest potential for loss. She also came to the opinion that it's important to consider downside risk while attempting to describe the range of anticipated returns.

Relevance of Study

Through an analysis of historical data and performance patterns, this research assists investors and stakeholders in pinpointing sector-specific prospects, refining diversification approaches, and determining ideal investment timing within the automobile industry.

Research Techniques

Research methods can be used to carefully tackle the research challenge. The science of systematic research study is another name for it. Usually, the topic or issue being studied is connected to the study's methodology. Area of Study

(a) To know the past and present trend of market volatility of SENSEX and AUTO index and analyze the kind relationship between the two.
(b) To carry this report out, thorough research has been done which includes reading of various approved research papers that exist on the web related to the topic of the company i.e BSE or simply in connection with the Stock Market. This will help to better understand how India's stock market is doing as a growing nation.

Tools Used for Data Analysis

(a) *MS Excel:* Microsoft Excel was used to present the data in the form of tables and to also plot line graphs based on the values of each index.
(b) *MS Word:* Microsoft Word was used to give a meaningful shape to the project report and make it in a presentable document.

Research Method

Since the study undertaken for this project is for an issue that has not yet been thoroughly researched, it is a "Exploratory" type of research that aims to set priorities, provide operational definitions, and enhance the final research design. The optimum study design, data gathering strategy, and subject selection are all determined via exploratory research.

Data Collection

‘This investigation was carried out using data from a "secondary" source. The Bombay Stock Exchange's official website was where the raw data was gathered.

Sample Size

This research has a sample size of data is starting January 2010 till December 2019.

DATA ANALYSIS

Acquire Monthly Values of BSE SENSEX Index

Here, the monthly data of each year starting from January 2010 till December 2019 has been acquired as shown in Table 3 to Table 12, studied and analyzed upon the trend line for each year has been shown on a graph from Figure 1 to Figure 10.

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2010

Table 3. BSE SENSEX 2010 Data.

Month	Close
Jan-10	16357.96
Feb-10	16429.55
Mar-10	17527.77
Apr-10	17558.71
May-10	16944.63
Jun-10	17700.9
Jul-10	17868.29
Aug-10	17971.12
Sep-10	20069.12
Oct-10	20032.34
Nov-10	19521.25
Dec-10	20509.09

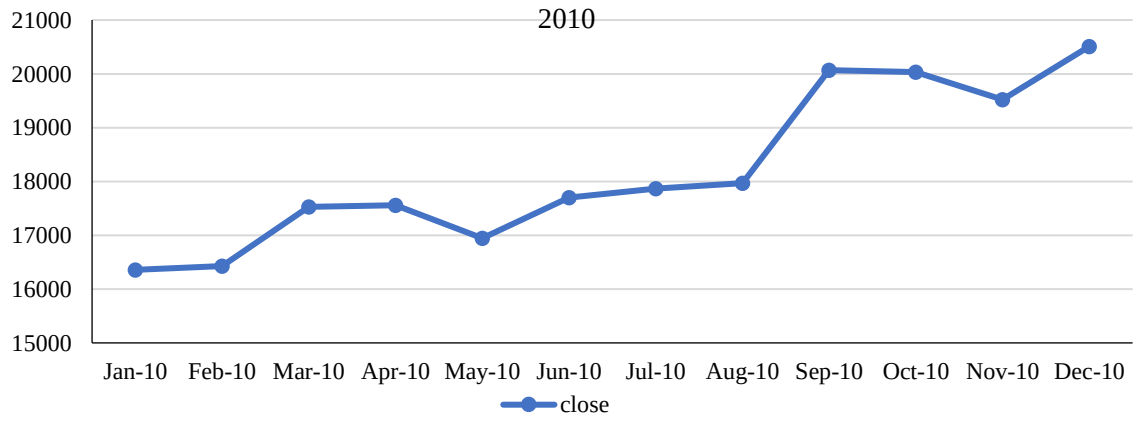


Figure 1. BSE SENSEX 2010 Graph.

Interpretation

SENSEX rises throughout the year.

Table 4. BSE SENSEX 2011 Data.

Month	Close
Jan-11	18327.76
Feb-11	17823.4
Mar-11	19445.22
Apr-11	19135.96
May-11	18503.28
Jun-11	18845.87
Jul-11	18197.2
Aug-11	16676.75
Sep-11	16453.76
Oct-11	17705.01
Nov-11	16123.46
Dec-11	15454.92

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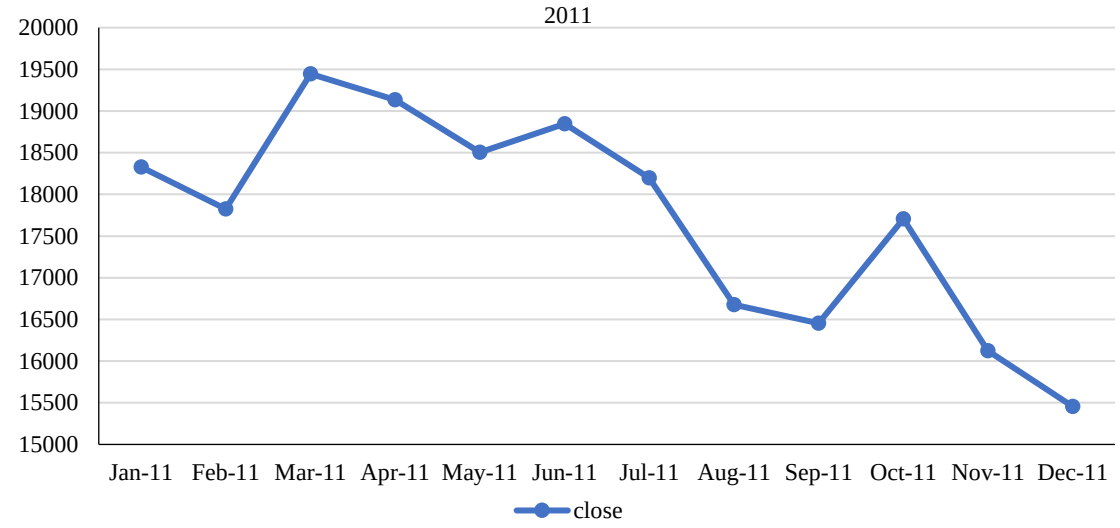


Figure 2. BSE SENSEX 2011Graph.

Interpretation

SENSEX starts declining marginally.

Table 5. BSE SENSEX 2012 Data.

Month	Close
Jan-12	17193.55
Feb-12	17752.68
Mar-12	17404.2
Apr-12	17318.81
May-12	16218.53
Jun-12	17429.98
Jul-12	17236.18
Aug-12	17429.56
Sep-12	18762.74
Oct-12	18505.38
Nov-12	19339.9
Dec-12	19426.71

2012

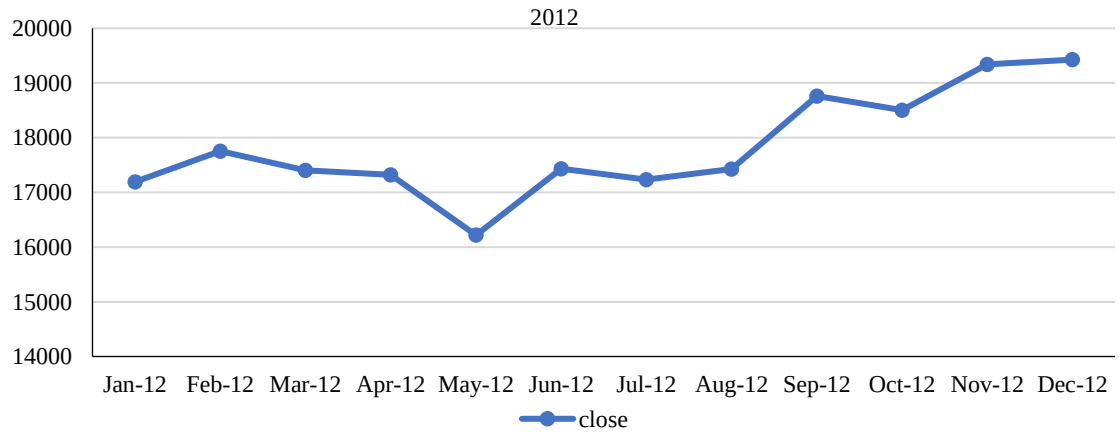


Figure 3. BSE SENSEX 2012 Graph.

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Interpretation

SENSEX slightly rises up in 2012

Table 6. BSE SENSEX 2013 Data.

Month	Close
Jan-13	19894.98
Feb-13	18861.54
Mar-13	18835.77
Apr-13	19504.18
May-13	19760.3
Jun-13	19395.81
Jul-13	19345.7
Aug-13	18619.72
Sep-13	19379.77
Oct-13	21164.52
Nov-13	20791.93
Dec-13	21170.68

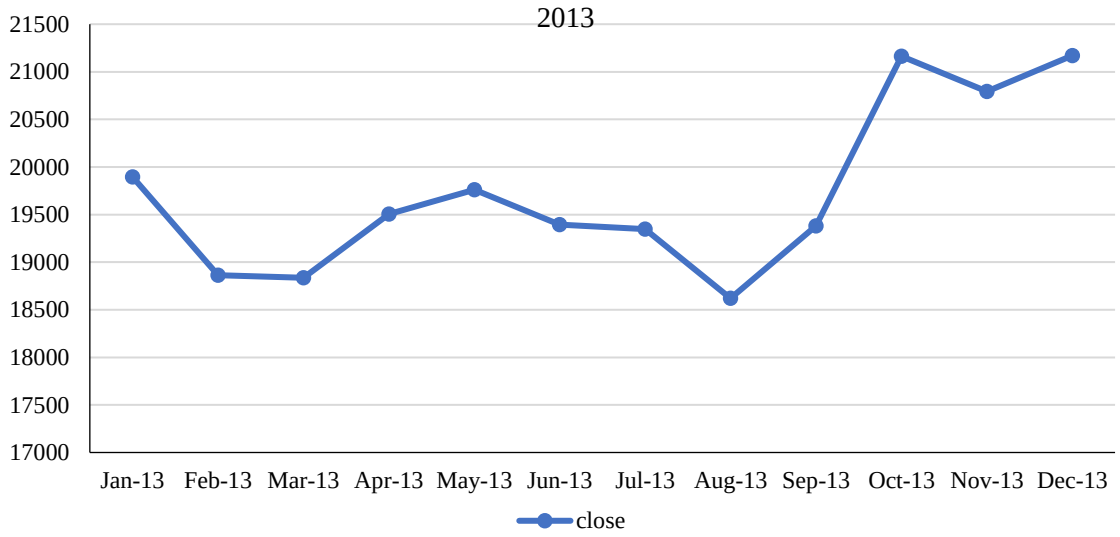


Figure 4. BSE SENSEX 2013 Graph.

Interpretation

SENSEX keeps on rising with short downfalls.

Table 7. BSE SENSEX 2014 Data.

Month	Close
Jan-14	20513.85
Feb-14	21120.12
Mar-14	22386.27
Apr-14	22417.8
May-14	24217.34
Jun-14	25413.78
Jul-14	25894.97

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Aug-14	26638.11
Sep-14	26630.51
Oct-14	27865.83
Nov-14	28693.99
Dec-14	27499.42

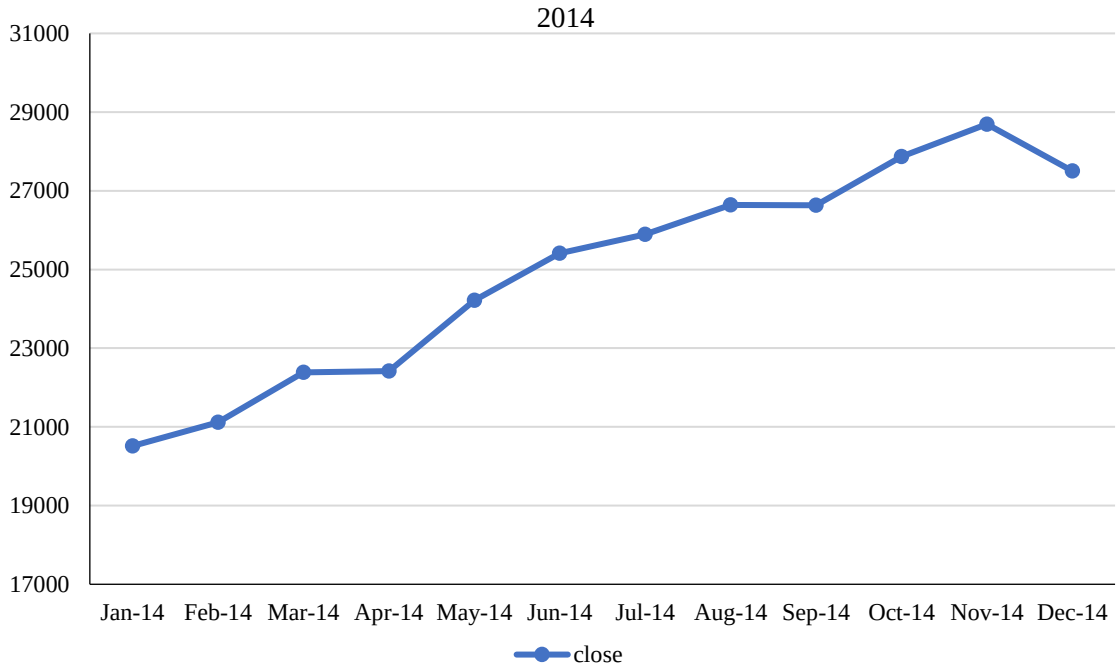


Figure 5. BSE SENSEX 2014 Graph.

Interpretation

SENSEX almost touches 28,000 marks.

Table 8. BSE SENSEX 2015 Data.

Month	**Close**
Jan-15	29182.95
Feb-15	29361.5
Mar-15	27957.49
Apr-15	27011.31
May-15	27828.44
Jun-15	27780.83
Jul-15	28114.56
Aug-15	26283.09
Sep-15	26154.83
Oct-15	26656.83
Nov-15	26145.67
Dec-15	26117.54

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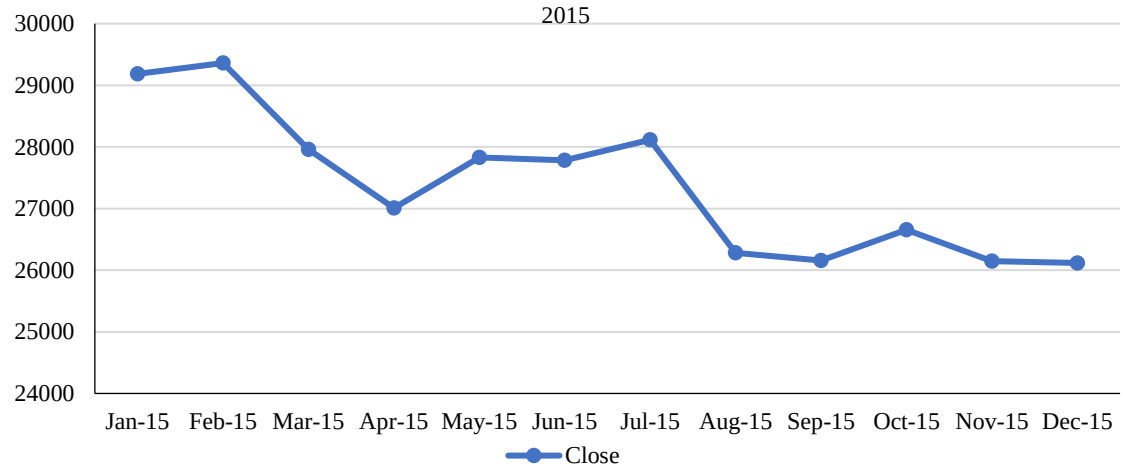


Figure 6. BSE SENSEX 2015 Graph.

Interpretation

SENSEX reaches an all-time high again and gradually declines.

Table 9. BSE SENSEX 2016 Data.

Month	Close
Jan-16	24870.69
Feb-16	23002
Mar-16	25341.86
Apr-16	25606.62
May-16	26667.96
Jun-16	26999.72
Jul-16	28051.86
Aug-16	28452.17
Sep-16	27865.96
Oct-16	27930.21
Nov-16	26652.81
Dec-16	26626.46

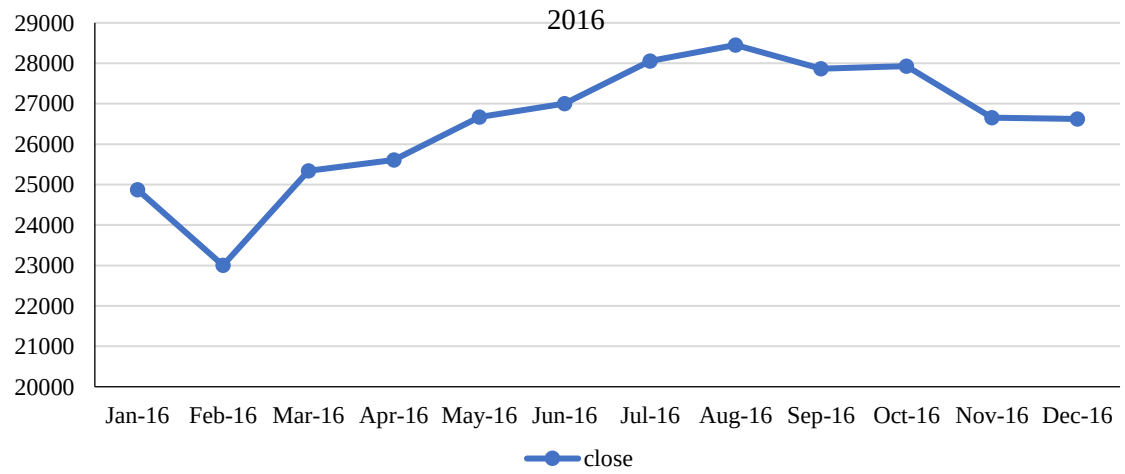


Figure 7. BSE SENSEX 2016 Graph.

Interpretation

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SENSEX shows promising results

Table 10. BSE SENSEX 2017 Data.

Month	Close
Jan-17	27655.96
Feb-17	28743.32
Mar-17	29620.5
Apr-17	29918.4
May-17	31145.8
Jun-17	30921.61
Jul-17	32514.94
Aug-17	31730.49
Sep-17	31283.72
Oct-17	33213.13
Nov-17	33149.35
Dec-17	34056.83

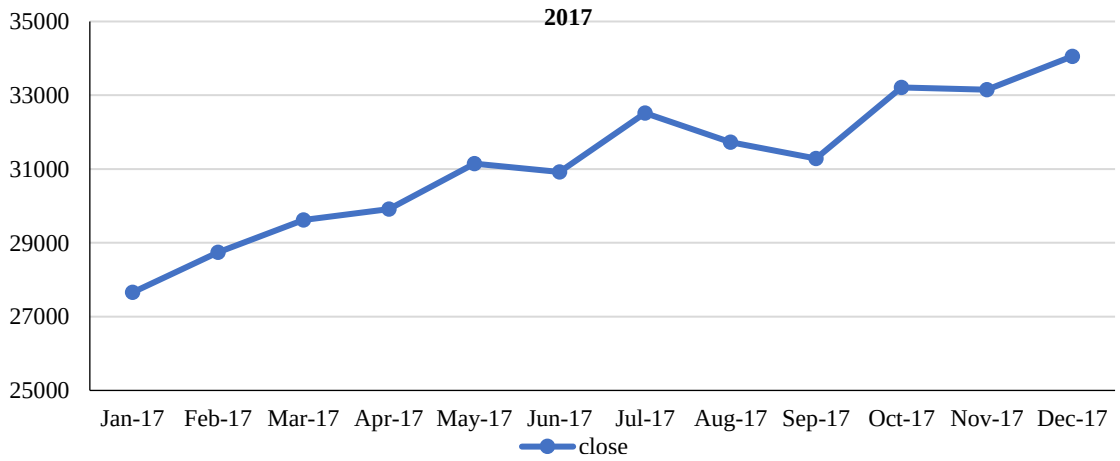


Figure 8. BSE SENSEX 2017 Graph.

Interpretation

SENSEX rises above 35,000 mark and then falls again

Table 11. BSE SENSEX 2018 Data.

Month	Close
Jan-18	35965.02
Feb-18	34184.04
Mar-18	32968.68
Apr-18	35160.36
May-18	35322.38
Jun-18	35423.48
Jul-18	37606.58
Aug-18	38645.07
Sep-18	36227.14
Oct-18	34442.05
Nov-18	36194.3
Dec-18	36068.33

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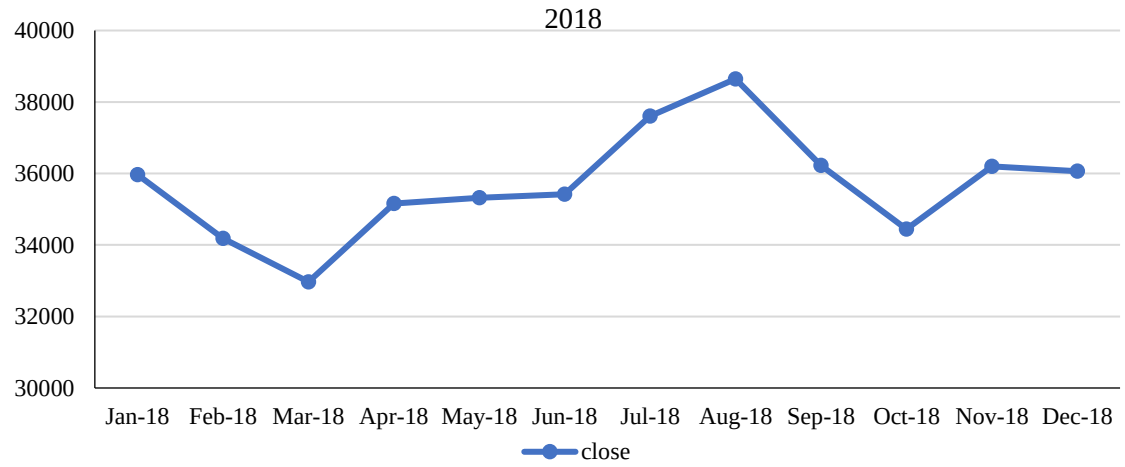


Figure 9. BSE SENSEX 2018 Graph.

Interpretation

SENSEX on the verge to touch 40,000 marks.

Table 12. BSE SENSEX 2019 Data

Month	Close
Jan-19	36,256.69
Feb-19	35,867.44
Mar-19	38,672.91
Apr-19	39,031.55
May-19	39,714.20
Jun-19	39,394.64
Jul-19	37,481.12
Aug-19	37,332.79
Sep-19	38,667.33
Oct-19	40,129.05
Nov-19	40,793.81
Dec-19	41,253.74

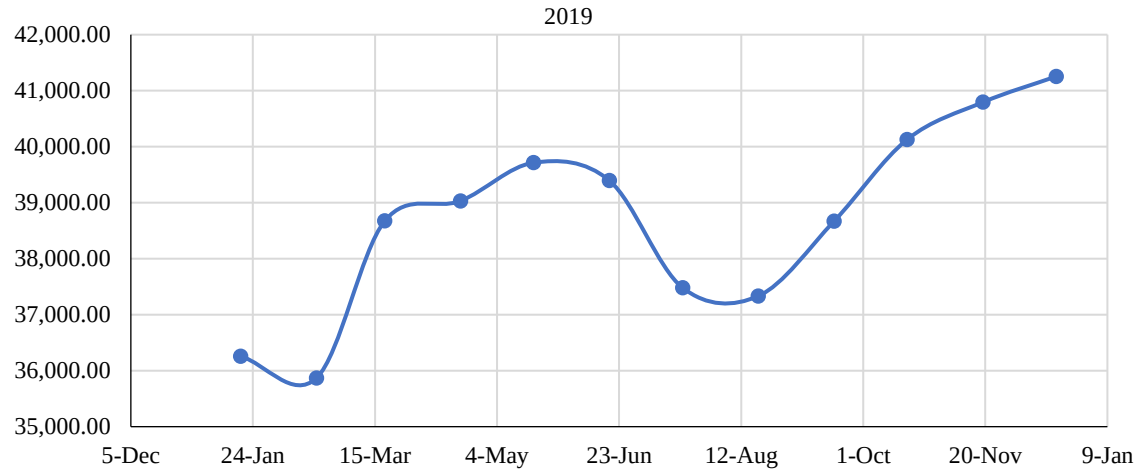


Figure 10. BSE SENSEX 2019 Graph.

Interpretation

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SENSEX touched 40,000 mark

AUTO INDEX MONTHLY ANALYSIS

Here, the monthly data of each year starting from January 2010 till December 2019 has been acquired, studied and analyzed upon. The trend line for each year has been shown on a graph (Table 11-20 and Figures 11-20).

Table 13. BSE AUTO 2010 Data.

Month	Close
Jan-10	6953.2
Feb-10	7170.99
Mar-10	7671.24
Apr-10	7799.85
May-10	7699.94
Jun-10	8323.3
Jul-10	8424.2
Aug-10	8813.79
Sep-10	9527.64
Oct-10	9909.91
Nov-10	10099.95
Dec-10	10235.41

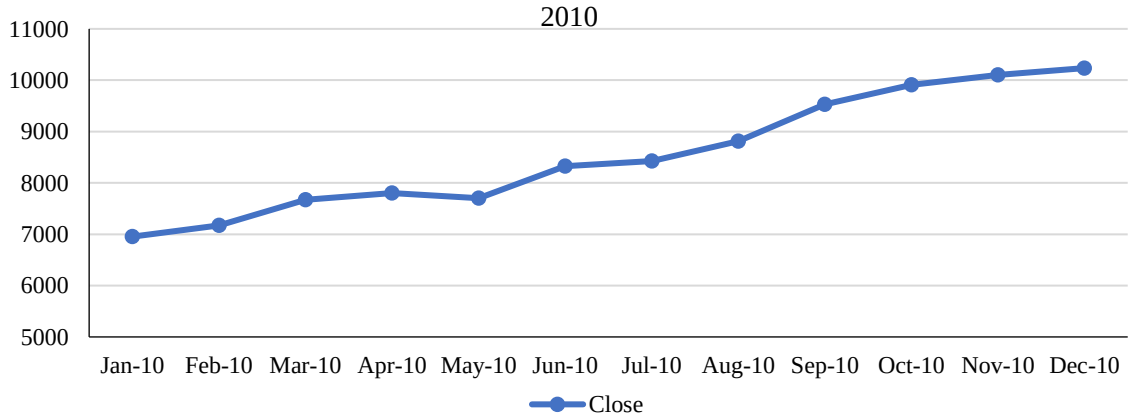


Figure 11. BSE AUTO INDEX 2010 Graph.

Table 14. BSE AUTO 2011 Data

Month	Close
Jan-11	8894.58
Feb-11	8252.92
Mar-11	9290.75
Apr-11	9559.94
May-11	8932.74
Jun-11	8798.48
Jul-11	8758.83
Aug-11	8396.16
Sep-11	8498.42
Oct-11	9477.19
Nov-11	8434.28
Dec-11	8143.65

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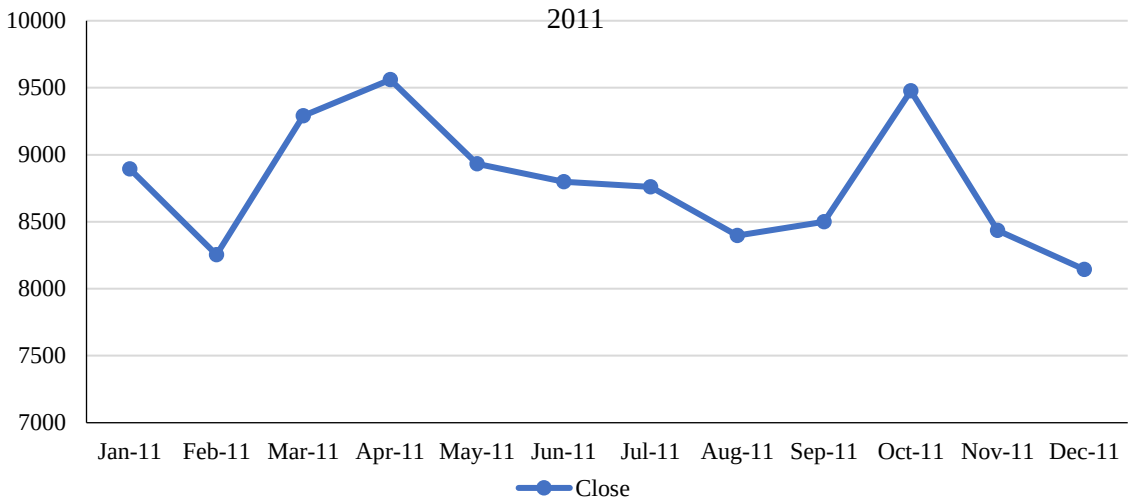


Figure 12. BSE AUTO INDEX 2011 Graph.

Table 15. BSE AUTO 2012 Data.

Month	Close
Jan-12	9241.78
Feb-12	9994.61
Mar-12	10134.88
Apr-12	10645.52
May-12	8873.01
Jun-12	9457.91
Jul-12	9114.07
Aug-12	9240.4
Sep-12	10413.19
Oct-12	10307.26
Nov-12	10814.46
Dec-12	11426.21

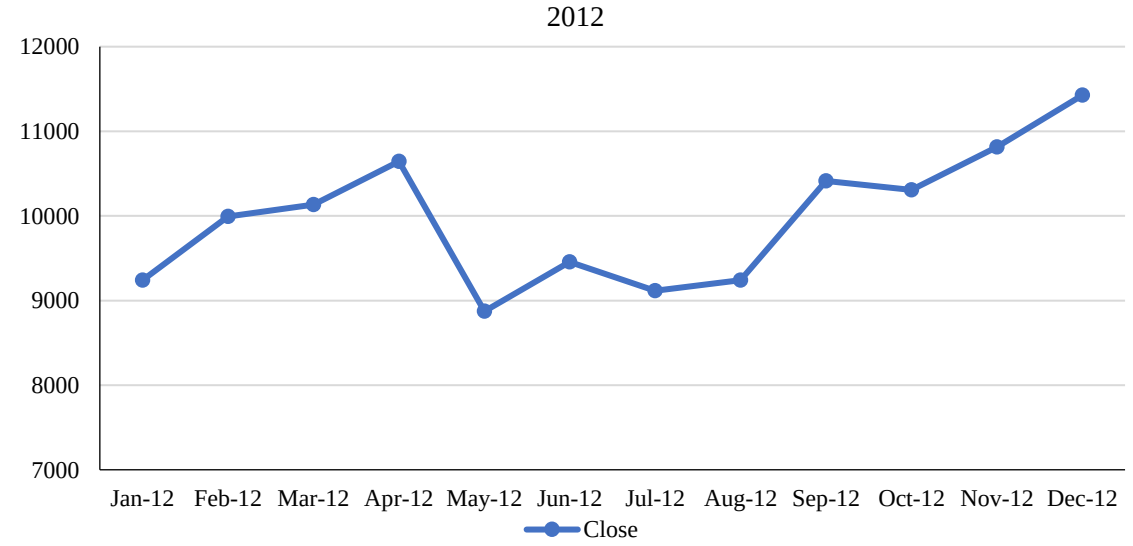


Figure 13. BSE AUTO INDEX 2012 Graph.

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Table 16. BSE AUTO 2013 Data.

Month	Close
Jan-13	10993.92
Feb-13	10458.61
Mar-13	9994.23
Apr-13	10957.88
May-13	11166.34
Jun-13	10715.77
Jul-13	10568.8
Aug-13	10202.17
Sep-13	10996.59
Oct-13	12074.9
Nov-13	12321.76
Dec-13	12258.83

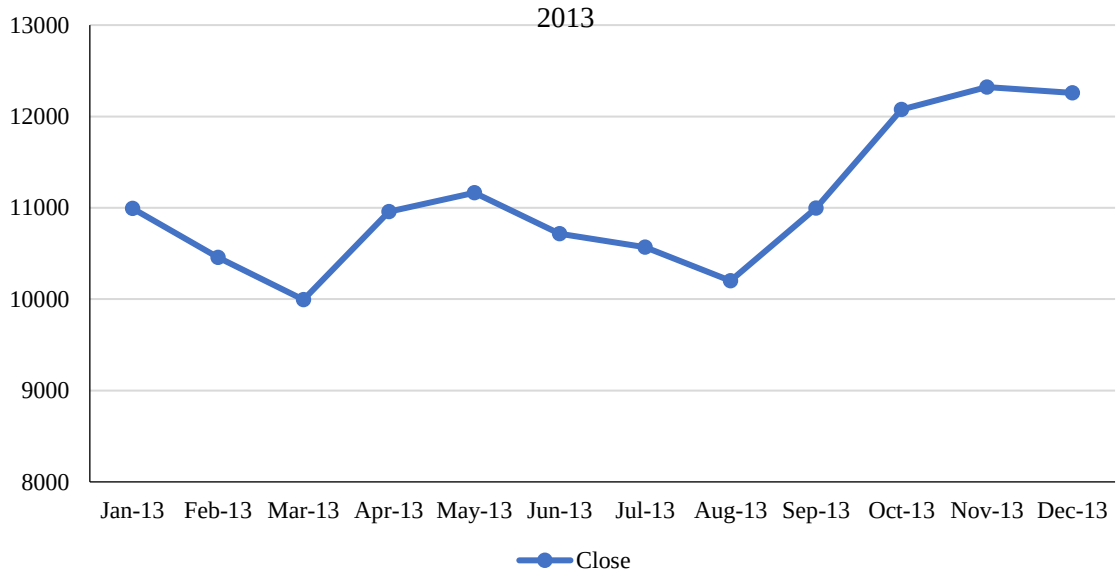


Figure 14. BSE AUTO INDEX 2013 Graph.

Table 17. BSE AUTO 2014 Data

Month	Close
Jan-14	11568.87
Feb-14	12598.73
Mar-14	13280.27
Apr-14	13372.23
May-14	14493.77
Jun-14	15249.29
Jul-14	15490.71
Aug-14	17293.65
Sep-14	17746.9
Oct-14	18579.07
Nov-14	19220.05
Dec-14	18630.84

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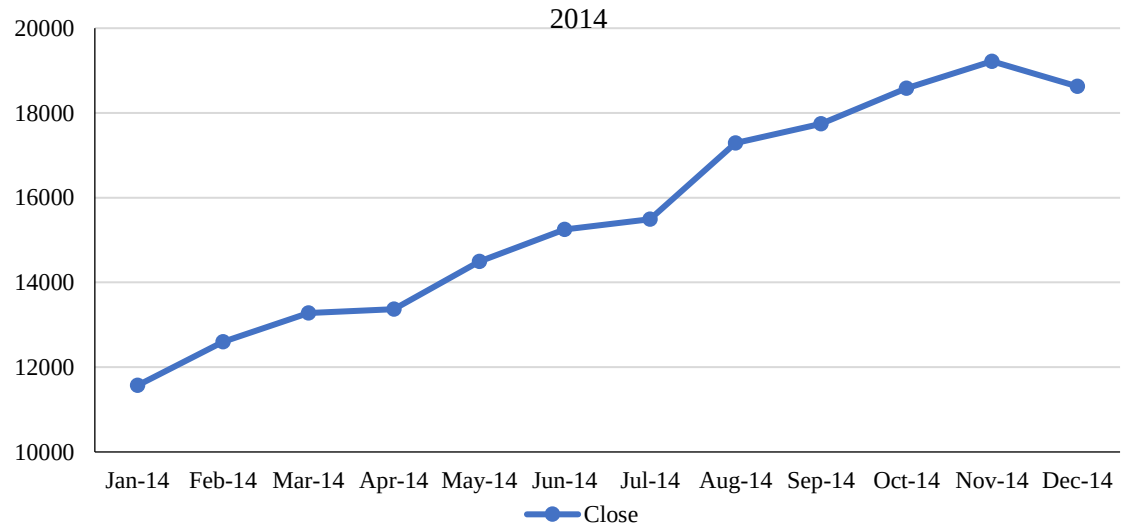


Figure 15. BSE AUTO INDEX 2014 Graph.

Table 18. BSE AUTO 2015 Data.

Month	Close
Jan-15	19985.9
Feb-15	19982.74
Mar-15	19258.66
Apr-15	18334.5
May-15	19079.79
Jun-15	18712.17
Jul-15	19107.78
Aug-15	17865.27
Sep-15	17391.08
Oct-15	18166.21
Nov-15	18964.36
Dec-15	18519.08

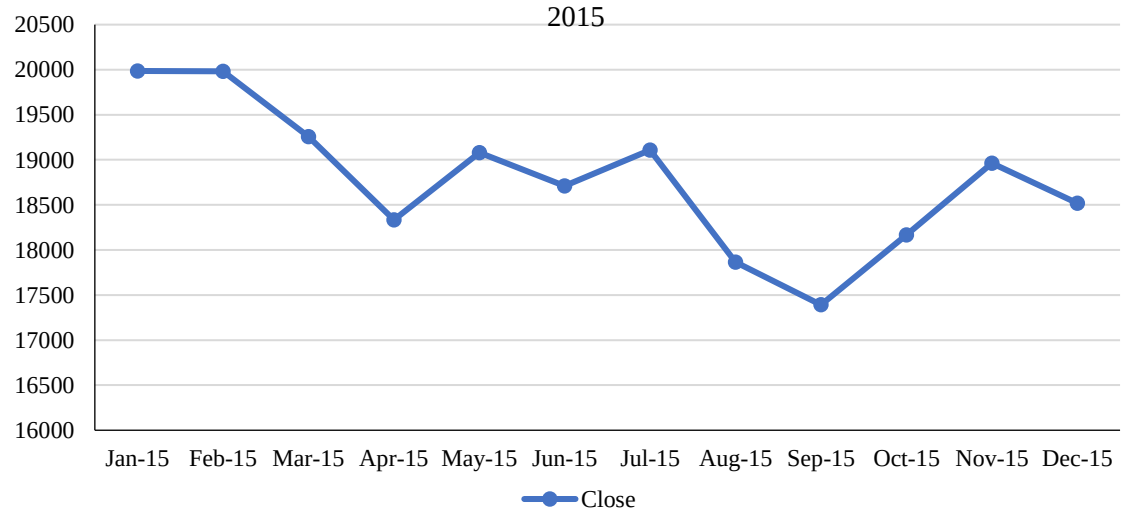


Figure 16. BSE AUTO INDEX 2015 Graph.

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Table 19. BSE AUTO 2016 Data.

Month	Close
Jan-16	17046.03
Feb-16	15851.55
Mar-16	18001.76
Apr-16	18469.4
May-16	19363.25
Jun-16	19744.64
Jul-16	21091.11
Aug-16	22008.15
Sep-16	22231.66
Oct-16	22185.39
Nov-16	20144.62
Dec-16	20257.43

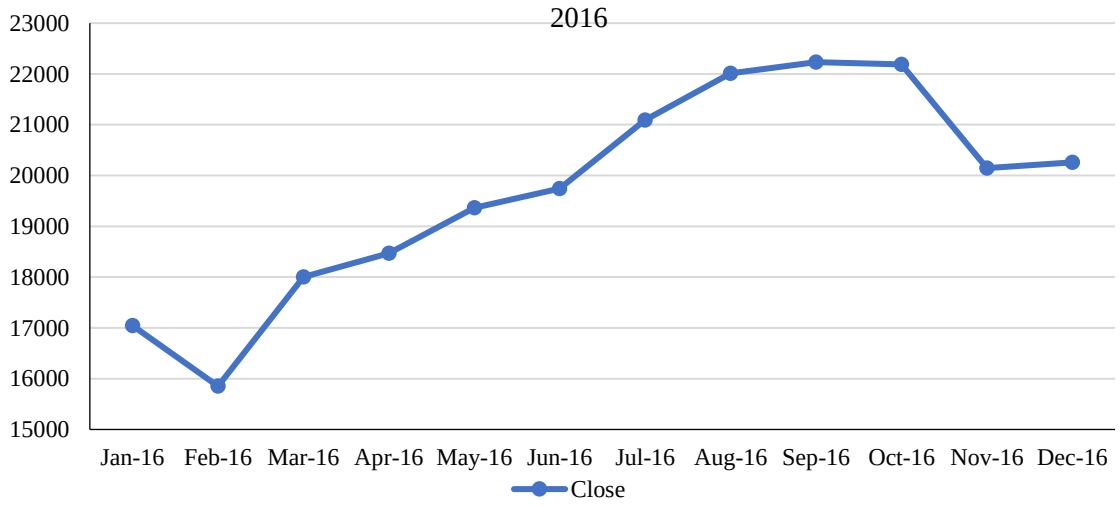


Figure 17. BSE AUTO INDEX 2016 Graph.

Table 20. BSE AUTO 2017 Data.

Month	Close
Jan-17	21809.24
Feb-17	21486.06
Mar-17	22012.66
Apr-17	22782.4
May-17	24161.95
Jun-17	23408.17
Jul-17	24463.15
Aug-17	23688.67
Sep-17	24180.04
Oct-17	25414.76
Nov-17	25205.37
Dec-17	26751.2

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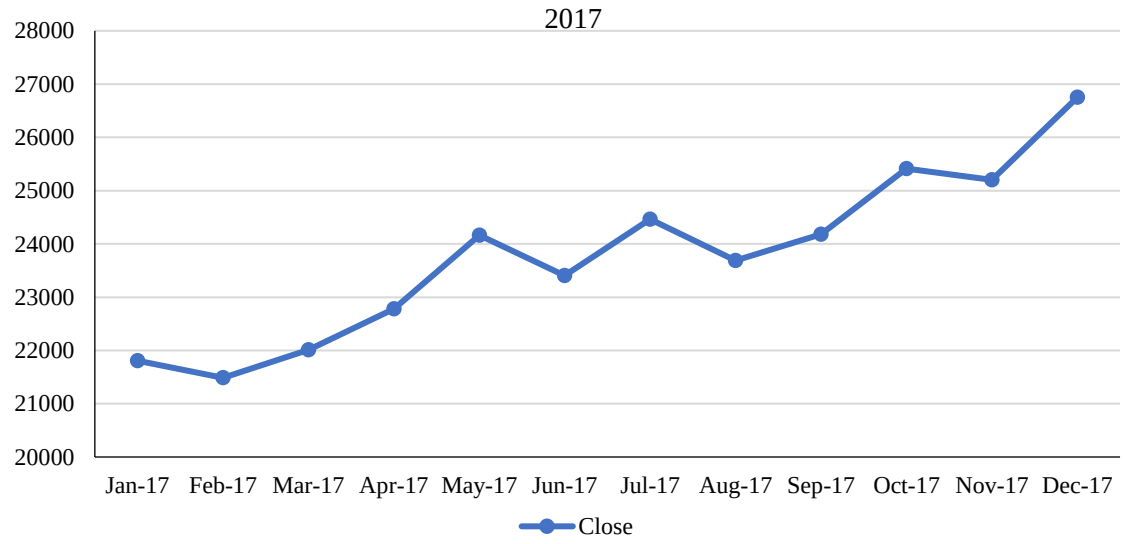


Figure 18. BSE AUTO INDEX 2017 Graph

Table 21. BSE AUTO 2018 Data.

Month	Close
Jan-18	25945.3
Feb-18	24832.4
Mar-18	24057.25
Apr-18	25833.75
May-18	24471.58
Jun-18	23838.3
Jul-18	24496.98
Aug-18	24716.48
Sep-18	21476.52
Oct-18	19881.08
Nov-18	20900.17
Dec-18	20833.73

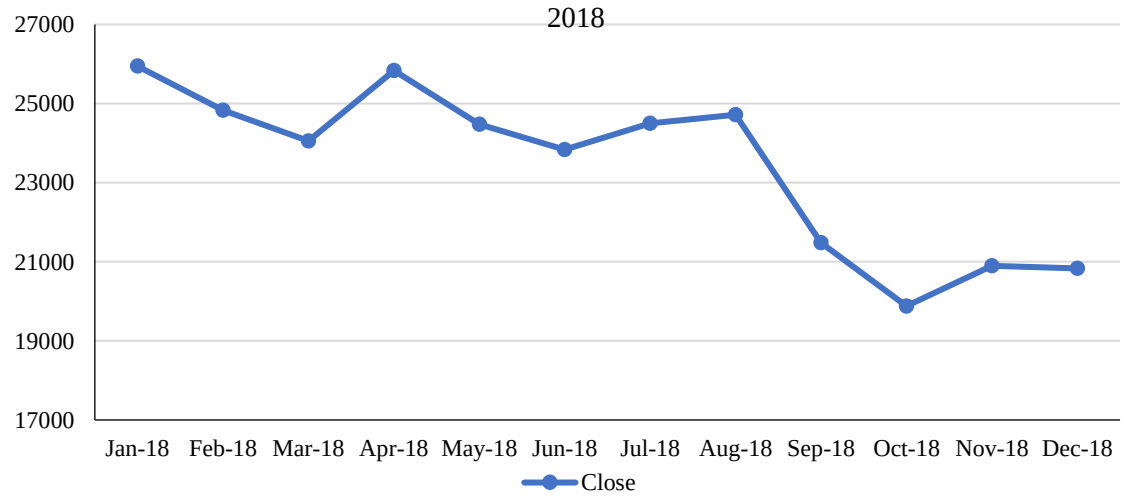


Figure 19. BSE AUTO INDEX 2018 Graph.

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Table 22. BSE AUTO 2019 Data.

Month	Close
Jan-19	18,494.59
Feb-19	18,805.66
Mar-19	18,824.89
Apr-19	18,839.40
May-19	18,445.99
Jun-19	17,904.15
Jul-19	15,472.03
Aug-19	15,768.40
Sep-19	16,761.78
Oct-19	18,945.63
Nov-19	18,099.52
Dec-19	18,485.00

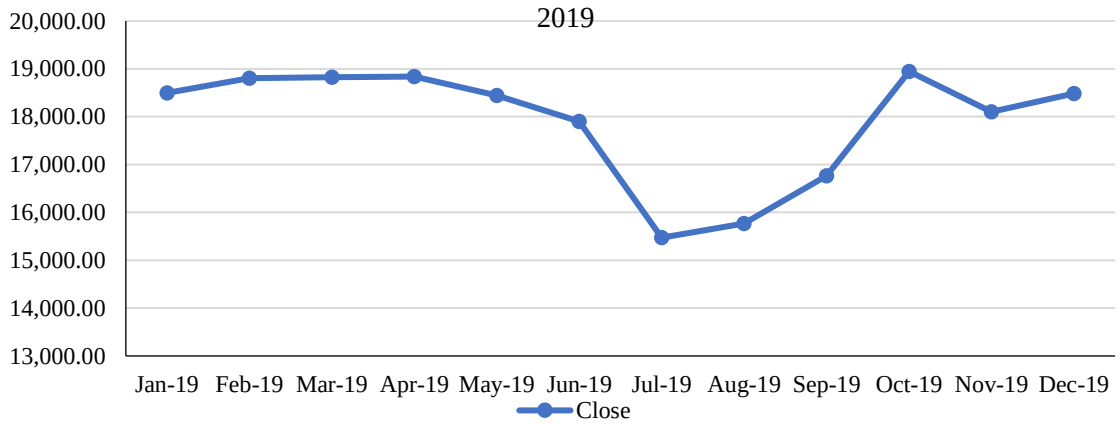


Figure 20. BSE AUTO INDEX 2019 Graph.

Sensex and Auto Index Monthly Analysis (Combine)

Here, the monthly data of each year starting from 2009 till 2018 has been acquired, studied and analyzed upon. The trend line for each year has been shown on a graph (Table 21-33 and Figures 21-30).

Table 23. BSE SENSEX & AUTO 2010 Combine Data.

Month	SENSEX Close	AUTO Close
Jan-10	16357.96	6953.2
Feb-10	16429.55	7170.99
Mar-10	17527.77	7671.24
Apr-10	17558.71	7799.85
May-10	16944.63	7699.94
Jun-10	17700.9	8323.3
Jul-10	17868.29	8424.2
Aug-10	17971.12	8813.79
Sep-10	20069.12	9527.64
Oct-10	20032.34	9909.91
Nov-10	19521.25	10099.95
Dec-10	20509.09	10235.41

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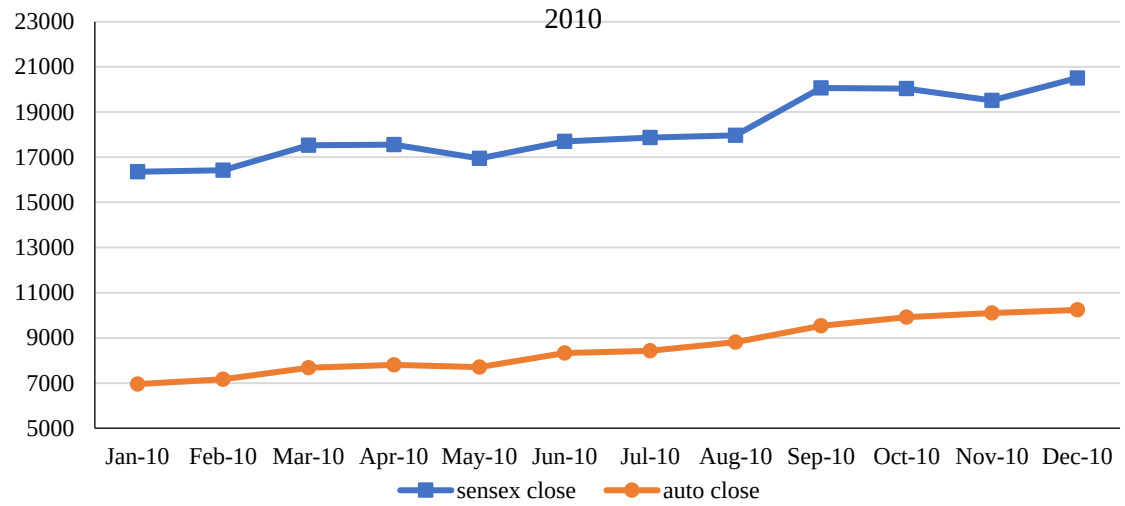


Figure 21. BSE SENSEX & AUTO 2010 Combine Data.

Interpretation

Auto Index also rises with the rise in SENSEX throughout the year.

Table 24. BSE SENSEX & AUTO 2011 Combine Data.

Month	**SENSEX**	**AUTO**
	Close	**Close**
Jan-11	18327.76	8894.58
Feb-11	17823.4	8252.92
Mar-11	19445.22	9290.75
Apr-11	19135.96	9559.94
May-11	18503.28	8932.74
Jun-11	18845.87	8798.48
Jul-11	18197.2	8758.83
Aug-11	16676.75	8396.16
Sep-11	16453.76	8498.42
Oct-11	17705.01	9477.19
Nov-11	16123.46	8434.28
Dec-11	15454.92	8143.65

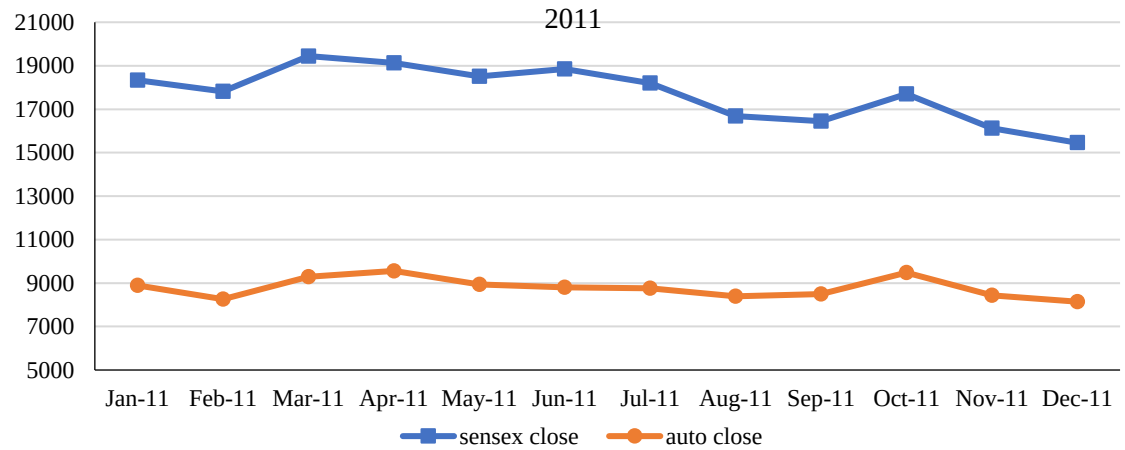


Figure 22. BSE SENSEX & AUTO 2011 Combine Data.

Interpretation

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Auto Index also declines with the decrease in SENSEX.

Table 25. BSE SENSEX & AUTO 2012 Combine Data.

`Month	Sensex	Auto
	Close	***Close***
Jan-12	17193.55	9241.78
Feb-12	17752.68	9994.61
Mar-12	17404.2	10134.88
Apr-12	17318.81	10645.52
May-12	16218.53	8873.01
Jun-12	17429.98	9457.91
Jul-12	17236.18	9114.07
Aug-12	17429.56	9240.4
Sep-12	18762.74	10413.19
Oct-12	18505.38	10307.26
Nov-12	19339.9	10814.46
Dec-12	19426.71	11426.21

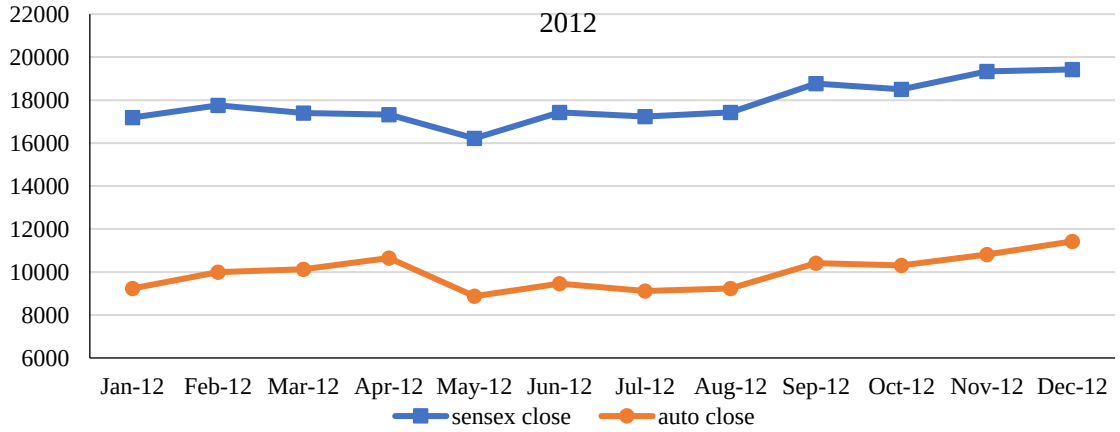


Figure 23. BSE SENSEX & AUTO 2012 Combine Data.

Interpretation

Auto Index also shows similar movement with reference to Sensex.

Table 26. BSE SENSEX & AUTO 2013 Combine Data.

Month	SENSEX	AUTO
	Close	**Close**
Jan-13	19894.98	10993.92
Feb-13	18861.54	10458.61
Mar-13	18835.77	9994.23
Apr-13	19504.18	10957.88
May-13	19760.3	11166.34
Jun-13	19395.81	10715.77
Jul-13	19345.7	10568.8
Aug-13	18619.72	10202.17
Sep-13	19379.77	10996.59
Oct-13	21164.52	12074.9
Nov-13	20791.93	12321.76
Dec-13	21170.68	12258.83

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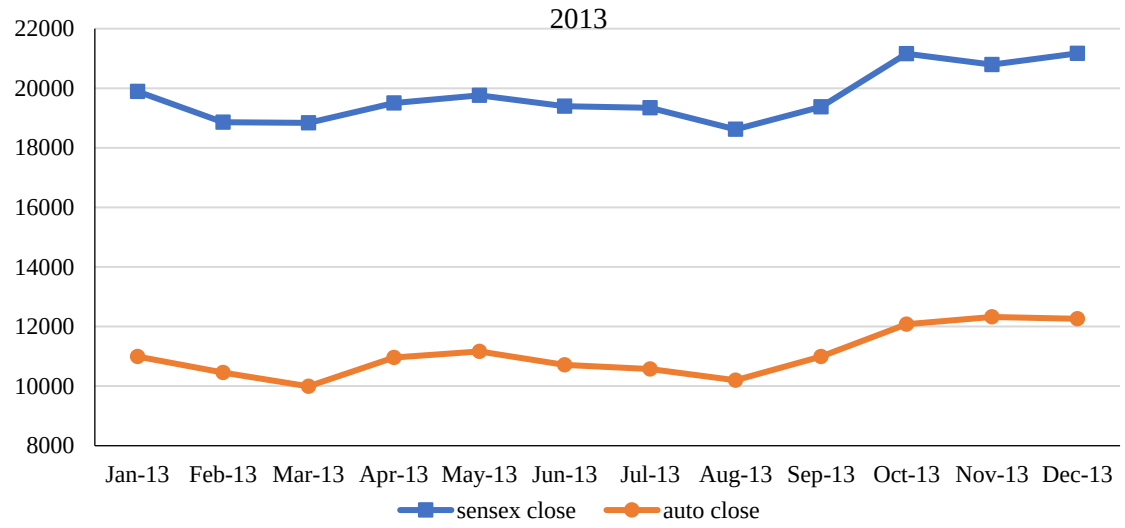


Figure 24. BSE SENSEX & AUTO 2013 Combine Data.

Interpretation

Auto Index also shows similar movement with reference to Sensex.

Table 27. BSE SENSEX & AUTO 2014Combine Data

Month	SENSEX	AUTO
	Close	Close
Jan-14	20513.85	11568.87
Feb-14	21120.12	12598.73
Mar-14	22386.27	13280.27
Apr-14	22417.8	13372.23
May-14	24217.34	14493.77
Jun-14	25413.78	15249.29
Jul-14	25894.97	15490.71
Aug-14	26638.11	17293.65
Sep-14	26630.51	17746.9
Oct-14	27865.83	18579.07
Nov-14	28693.99	19220.05
Dec-14	27499.42	18630.84

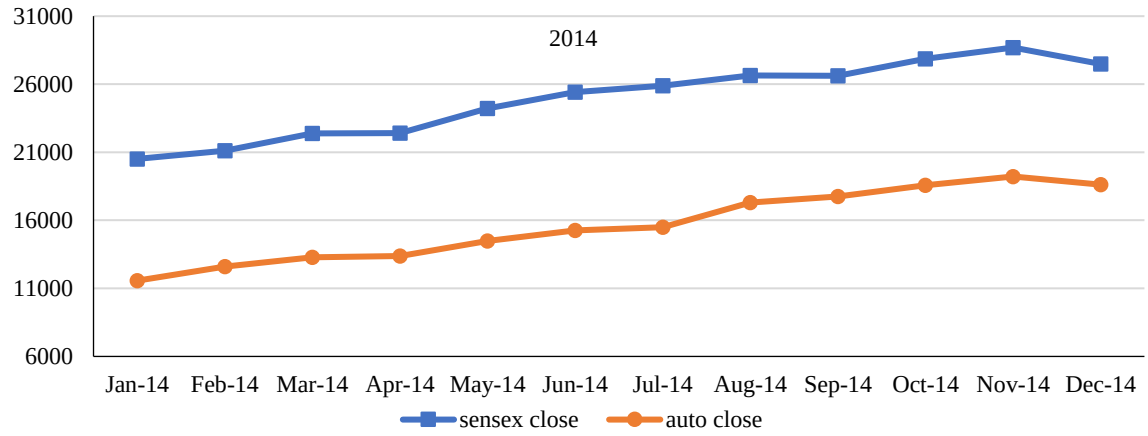


Figure 25. BSE SENSEX & AUTO 2014 Combine Data.

Interpretation

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Auto Index remains similar with context to movement of SENSEX.

Table 28. BSE SENSEX & AUTO 2015 Combine Data.

Month	SENSEX	AUTO
	Close	Close
Jan-15	29182.95	19985.9
Feb-15	29361.5	19982.74
Mar-15	27957.49	19258.66
Apr-15	27011.31	18334.5
May-15	27828.44	19079.79
Jun-15	27780.83	18712.17
Jul-15	28114.56	19107.78
Aug-15	26283.09	17865.27
Sep-15	26154.83	17391.08
Oct-15	26656.83	18166.21
Nov-15	26145.67	18964.36
Dec-15	26117.54	18519.08

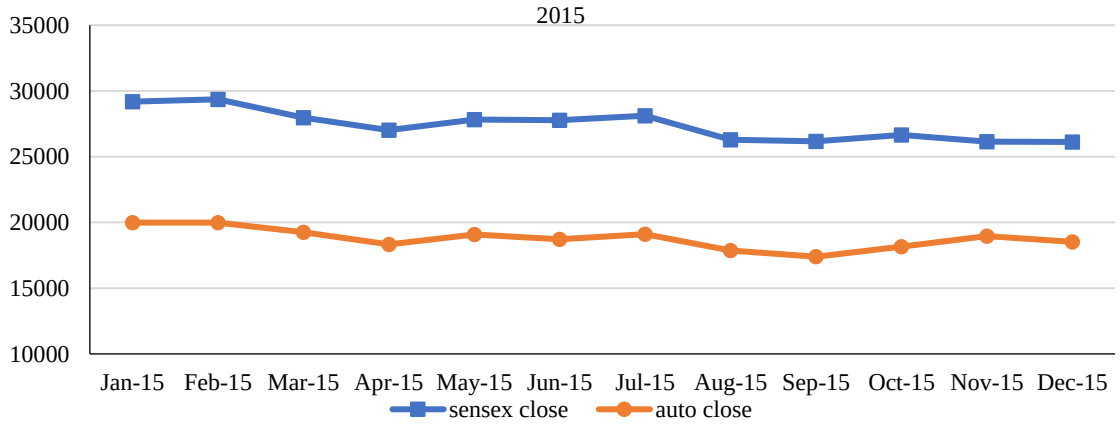


Figure 26. BSE SENSEX & AUTO 2015 Combine Data.

Interpretation

Auto Index remains similar with context to movement of SENSEX

Table 29. BSE SENSEX & AUTO 2016 Combine Data.

Month	Sensex	Auto
	Close	*Close*
Jan-16	24870.69	17046.03
Feb-16	23002	15851.55
Mar-16	25341.86	18001.76
Apr-16	25606.62	18469.4
May-16	26667.96	19363.25
Jun-16	26999.72	19744.64
Jul-16	28051.86	21091.11
Aug-16	28452.17	22008.15
Sep-16	27865.96	22231.66
Oct-16	27930.21	22185.39
Nov-16	26652.81	20144.62
Dec-16	26626.46	20257.43

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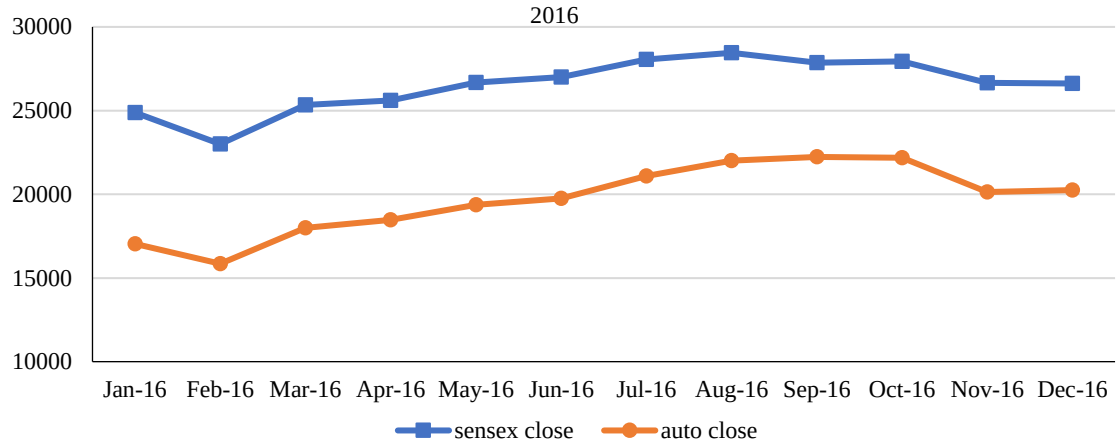


Figure 27. BSE SENSEX & AUTO 2016 Combine Data.

Interpretation

Auto Index remains similar with context to movement of SENSEX.

Table 30. BSE SENSEX & AUTO 2017 Combine Data.

Month	Sensex	Auto
	Close	Close
Jan-17	27655.96	21809.24
Feb-17	28743.32	21486.06
Mar-17	29620.5	22012.66
Apr-17	29918.4	22782.4
May-17	31145.8	24161.95
Jun-17	30921.61	23408.17
Jul-17	32514.94	24463.15
Aug-17	31730.49	23688.67
Sep-17	31283.72	24180.04
Oct-17	33213.13	25414.76
Nov-17	33149.35	25205.37
Dec-17	34056.83	26751.2

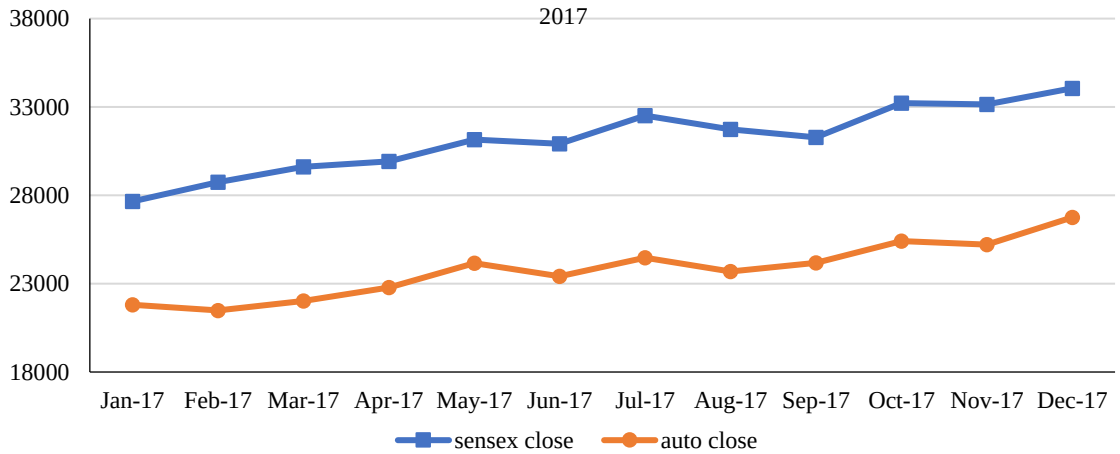


Figure 28. BSE SENSEX & AUTO 2017 Combine Data.

Interpretation

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Auto Index remains similar with context to movement of SENSEX.

Table 31. BSE SENSEX & AUTO 2018 Combine Data

Month	SENSEX	AUTO
	Close	Close
Jan-18	35965.02	25945.3
Feb-18	34184.04	24832.4
Mar-18	32968.68	24057.25
Apr-18	35160.36	25833.75
May-18	35322.38	24471.58
Jun-18	35423.48	23838.3
Jul-18	37606.58	24496.98
Aug-18	38645.07	24716.48
Sep-18	36227.14	21476.52
Oct-18	34442.05	19881.08
Nov-18	36194.3	20900.17
Dec-18	36068.33	20833.73

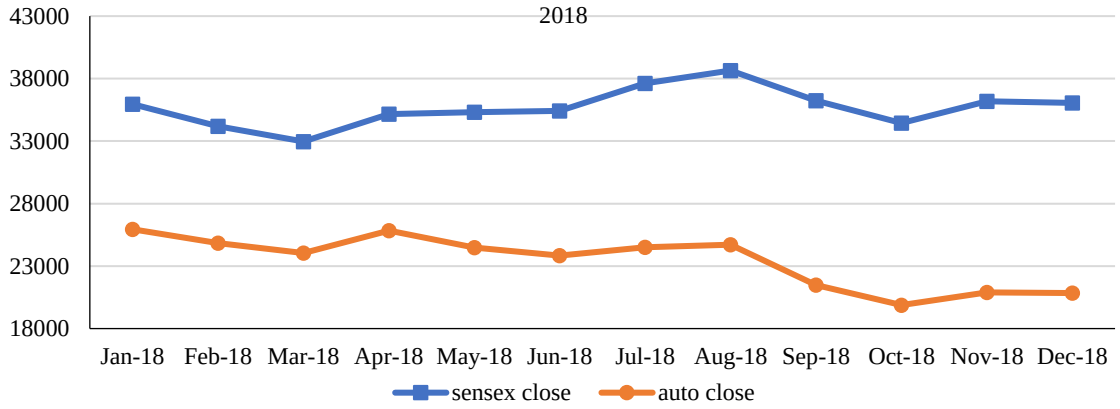


Figure 29. BSE SENSEX & AUTO 2018 Combine Data.

Interpretation

Auto Index remains similar with context to movement of SENSEX.

Table 32. BSE SENSEX & AUTO 2018 Combine Data

Month	Sensex	Auto
	Close	*Close*
Jan-19	36,256.69	18,494.59
Feb-19	35,867.44	18,805.66
Mar-19	38,672.91	18,824.89
Apr-19	39,031.55	18,839.40
May-19	39,714.20	18,445.99
Jun-19	39,394.64	17,904.15
Jul-19	37,481.12	15,472.03
Aug-19	37,332.79	15,768.40
Sep-19	38,667.33	16,761.78
Oct-19	40,129.05	18,945.63
Nov-19	40,793.81	18,099.52
Dec-19	41,253.74	18,485.00

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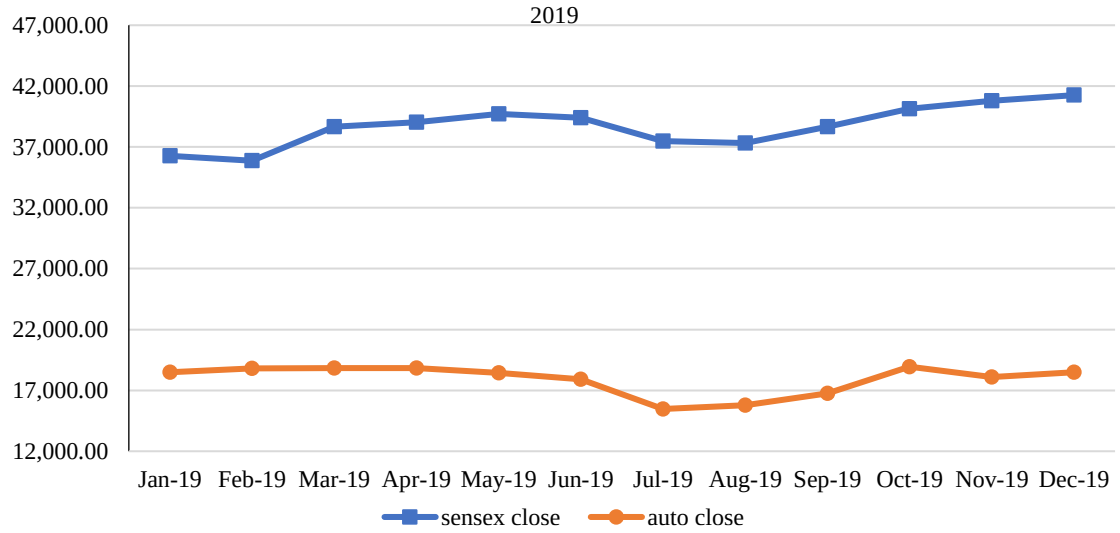


Figure 30. BSE SENSEX & AUTO 2018 Combine Data.

Interpretation

Auto Index declines even though there is a increase in Sensex One of the main elements may be the 17.98% fall in passenger car sales between April and November 2019.

Sensex Yearly Analysis

Here, the yearly data starting from 2009 till 2018 has been acquired, studied and analyzed upon. A graph has been plotted to show the trend line of each year Table 31 and Figure 31.

Table 33. BSE SENSEX Yearly Data.

Year	Close
2010	20509.09
2011	15454.92
2012	19426.71
2013	21170.68
2014	27499.42
2015	26117.54
2016	26626.46
2017	34056.83
2018	36068.33
2019	41,253.74

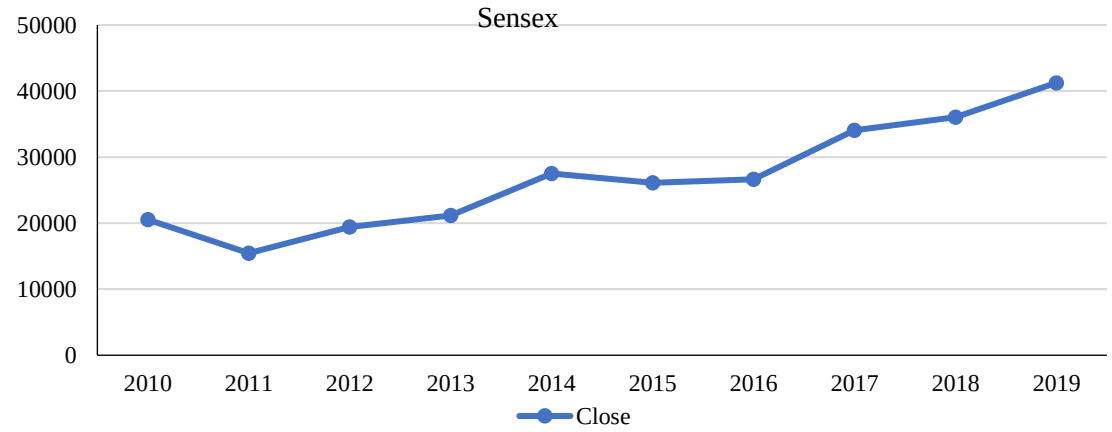


Figure 31. BSE SENSEX INDEX Yearly Graph.

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Auto Index Yearly Analysis

Here, the yearly data starting from 2008 till 2018 has been acquired, studied and analyzed upon. A graph has been plotted to show the trend line of each year Table 32 and Figure 32.

Table 34. BSE AUTO Index yearly data.

Year	Close
2010	10235.41
2011	8143.65
2012	11426.21
2013	12258.83
2014	18630.84
2015	18519.08
2016	20257.43
2017	26751.2
2018	20833.73
2019	18,485.00

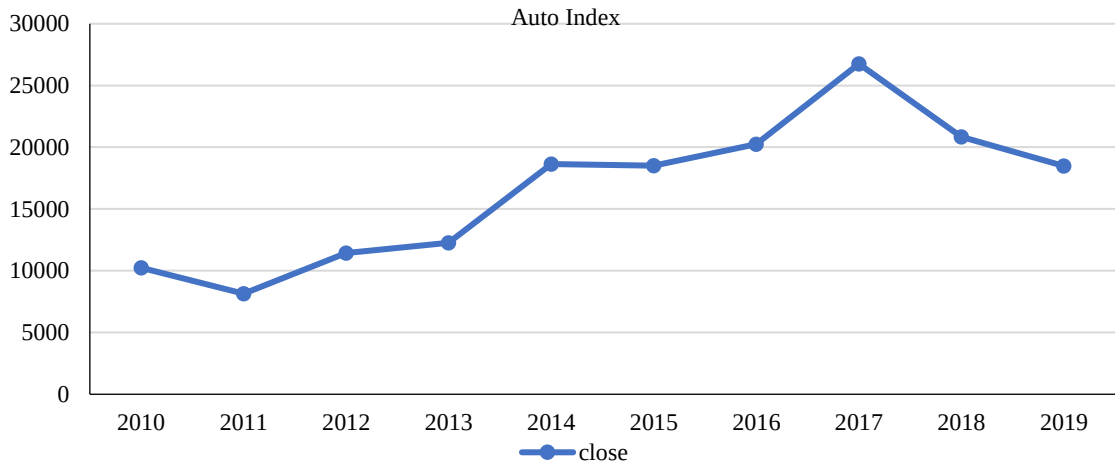


Figure 32. BSE AUTO INDEX yearly graph.

Sensex and Auto Index Yearly Analysis (Combine)

Here, the yearly data starting from 2008 till 2018 has been acquired, studied and analyzed upon. A graph has been plotted to show the trend line of each year Table 33 and Figure 33.

Table 35. BSE SENSEX & AUTO Index yearly combine data.

Year	Close(SENSEX)	Close (AUTO)
2010	20509.09	10235.41
2011	15454.92	8143.65
2012	19426.71	11426.21
2013	21170.68	12258.83
2014	27499.42	18630.84
2015	26117.54	18519.08
2016	26626.46	20257.43
2017	34056.83	26751.2
2018	36068.33	20833.73
2019	41,253.74	18,485.00

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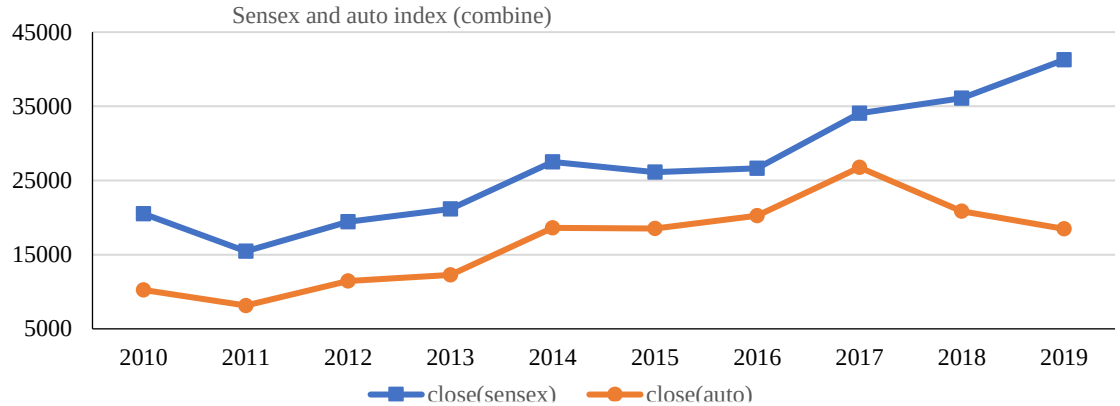


Figure 33. BSE SENSEX & AUTO INDEX Yearly Combine Graph.

Finding the co-relation of SENSEX and AUTO Index

Here, the co-relation has been calculated on the basis of 10-year data of both SENSEX & AUTO Index. The 'CORREL' function of MS Excel has been used for this purpose Tables 34-37 and Figure 34.

FINDINGS AND CONCLUSION

Following tables depicts the findings of SENSEX

Table 36. Co-relation between SENSEX & AUTO Index.

Year	Close(SENSEX)	Close (AUTO)
2010	20509.09	10235.41
2011	15454.92	8143.65
2012	19426.71	11426.21
2013	21170.68	12258.83
2014	27499.42	18630.84
2015	26117.54	18519.08
2016	26626.46	20257.43
2017	34056.83	26751.2
2018	36068.33	20833.73
2019	41,253.74	18,485.00
Co-Relation	0.790925	

Table 37. BSE SENSEX & AUTO INDEX Yearly Combine Data.

		SENSEX		AUTO	
Year		**Open(SENSEX)**	**Close(SENSEX)**	**Open(AUTO)**	**Close(AUTO)**
2010		17473.45	20509.09	7477.72	10235.41
2011		20621.61	15454.92	10337.49	8143.65
2012		15534.67	19426.71	8216.59	11426.21
2013		19513.45	21170.68	11505.75	12258.83
2014		21222.19	27499.42	12290.21	18630.84
2015		27485.77	26117.54	18586.8	18519.08
2016		26101.5	26626.46	18540.58	20257.43
2017		26711.15	34056.83	20353.49	26751.2
2018		34059.99	36068.33	26807.79	20833.73

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2019		36,161.80	41,253.74	20,854.95	18,485.00

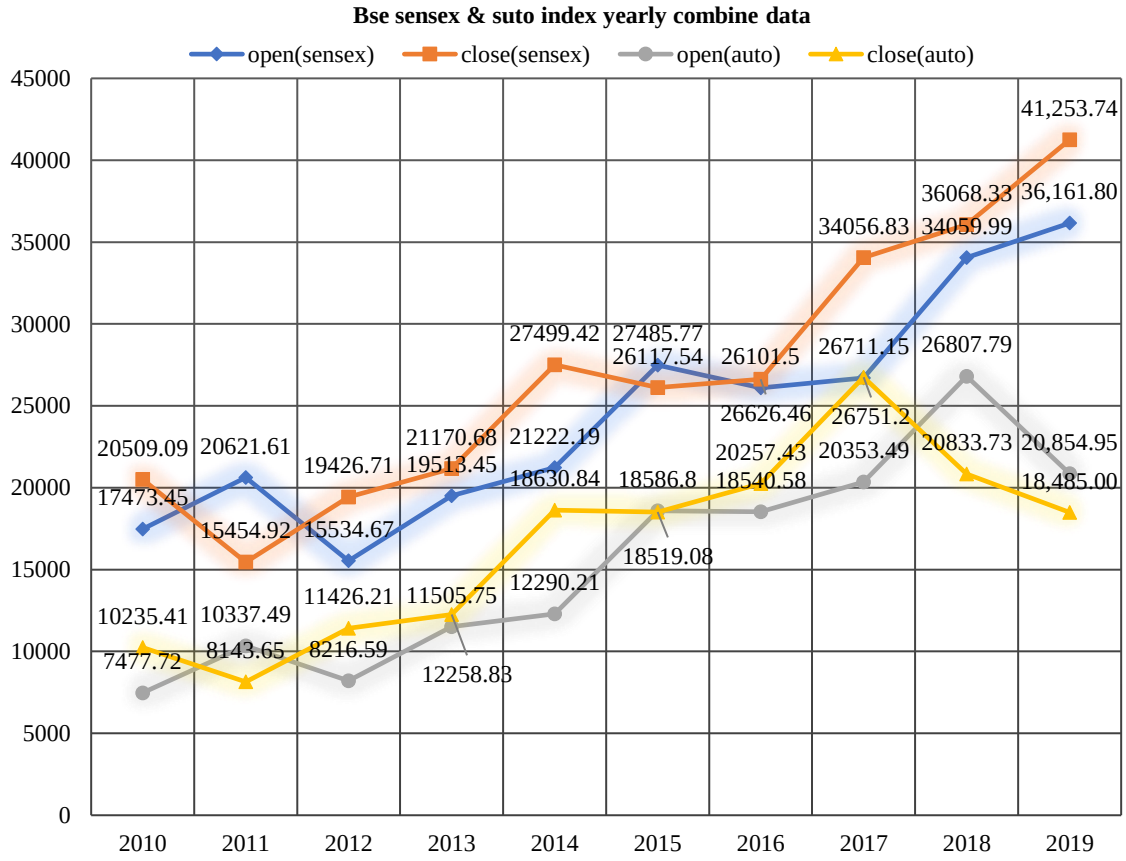


Figure 34. BSE SENSEX & AUTO INDEX Yearly Combine Graph.

Result

Trend Analysis

The BSE Auto Index showed growth, but it faced notably pronounced fluctuations, especially in response to economic downturns and policy shifts.

Volatility and Risk Assessment

The BSE Auto Index displayed greater annualized volatility in contrast to the BSE Sensex, signaling elevated risk within the automobile sector.

Returns and Performance Metrics

Despite its elevated volatility, the BSE Auto Index provided competitive returns amid industry growth, outperforming during bullish periods. In contrast, the BSE Sensex yielded more consistent returns due to its diversified composition.

Final Findings

Practically, these discoveries suggest that investors in the automobile sector should be prepared for higher risk and fluctuations but may benefit from opportunistic returns during bullish phases. Diversification remains a valuable strategy, with the BSE Sensex serving as a benchmark for stability. Stakeholders can use this information to make informed investment decisions and develop risk management strategies in the dynamic landscape of the stock market.

Findings underscore the importance of timing within the automobile sector. Investors can optimize their returns by strategically entering or exiting the market based on industry cycles and broader

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economic conditions. Policymakers and industry leaders should also consider the implications of these trends when formulating policies and long-term strategies for the automotive sector. Overall, this research provides actionable insights for investors, stakeholders, and decision-makers in navigating the real-world dynamics of the stock market and the automobile industry.

Future Research

Investigate the impact of specific policy changes and technological advancements on the BSE Auto Index's performance relative to the BSE Sensex to understand how external factors influence the automobile industry.

CONCLUSION

The Indian Stock Market has seen a steady rise in investors as well as listed companies from the 2009.Majority of the BSE SENSEX Index Constituents have remained in the list for more than 15 years and are powerful enough to manipulate the stock prices. BSE SENSEX Index gives us a more overview of how the stock market is performing in the current scenario. As far as the prediction goes for SENSEX, it can be said that SENSEX will reach a saturation point after some years as per the current trend as the market is investors who are willing to invest more in mutual funds rather than directly investing in stocks. The BSE AUTO Index has been somewhat consistent with the price level with a few movements. It can also be concluded that there is direct relation of the volatility of SENSEX & AUTO as per the past and present trend It can also be predicted that the SENSEX Index may have effect on the AUTO Index in the near future as per the recent trends.

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