

# **Project Dissertation Report**

## **Mercury Retrograde and its effect on Stock Market returns: Evidence from India & USA**

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## **CERTIFICATE FROM THE INSTITUTE**

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## **DECLARATION**

I, Srishti Arora, student of MBA 2021-23 of Delhi School of Management, Delhi Technological University, hereby declare that Project Dissertation report on **“Mercury Retrograde and its effect on Stock Market returns: Evidence from India & USA”** submitted in partial fulfilment of Degree of Master of Business Administration is the original work conducted by me. I also confirm that neither I nor any other person has submitted this project report to any other institution or university for any other degree or diploma. I further declare that the information collected from various sources has been duly acknowledged in this project.

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Last but not the least, I would like to thank all my colleagues whose valuable inputs help me complete this research.

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## **Executive Summary**

Since the beginning of humanity, astrological beliefs have been a significant part of human history, thought, worldviews, language, and other aspects of social culture. The practice of linking the movement of celestial bodies to the events in the financial markets has been a relatively newer concept, however, various researchers have alluded that astrological perceptions are bound to impact the investment decisions and thereby impact the capital markets.

Thus, this paper aims at evaluating the impact of one of the most well-known astrological phenomenon, Mercury Retrograde on capital markets. According to astrological tradition, although an optical illusion, Mercury retrograde periods are marked by confusion and miscommunications. There is a long-held view that it is advisable to avoid established plans during Mercury retrograde, signing contracts, starting new initiatives, or opening new stock market positions since the trades could be less effective and the people more likely to make mistakes.

The paper presents and probes whether the usually described astrological impacts of retrogradatory effects of planets persists in Indian stock indices i.e. NIFTY50 and BSE Sensex & American Stock Indices i.e. NASDAQ & DJIA. This research utilizes the secondary data of daily closing prices from 2013- 2023 retrieved from official websites of NSE and BSE for Indian Stock exchanges and from Yahoo Finance for American stock exchanges. Further, the study employs regression models in order to inspect the impact and the correlation between return and retrograde periods. The proposed model also considers the dynamic character to past returns along with retrograde dummy variables.

An attempt has been made to explore the impact of cultural variables on behavioural bias in Indian stock indices under the influence of mercury's retrograde movement, which causes asymmetric information and market oddity. Thus, the finding of the study are concerned with return's volatility during the planetary movement and investigate the influence of this cultural variable on stock indices.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Stock Market & its Evolution

A stock market or a stock exchange is an actual or a virtual location where investors can buy and sell stock, or shares, in publicly traded corporations. Each share's price is influenced by a number of factors such as, investor mood, domestic and international economic developments, as well as supply and demand dynamics. Higher the demand, higher the prices; fall in demand can lead to a steep fall in the prices of a share.

The stock market or the stock exchanges all around the globe that we see today are not what it used to be. There have been number of changes and evolutions that has made them operate in the way they are. The history of stock market dates backs to hundreds of years ago to 13<sup>th</sup> century in Europe.

In early 1400's merchants residing in modern day Belgium, bought goods in an anticipation that the prices of the goods might go up in the future and they might make gains by selling them. This process to buy at a time to make gains later has been carried on for years but for formalized only in the year 1600 where first modern stock trading was introduced in Amsterdam. The *Dutch East India Company* was the first publicly traded company, in order to raise capital, the company decided to sell stock and pay dividends of the shares to investors and for many years remained only company with trading activity on the exchange.

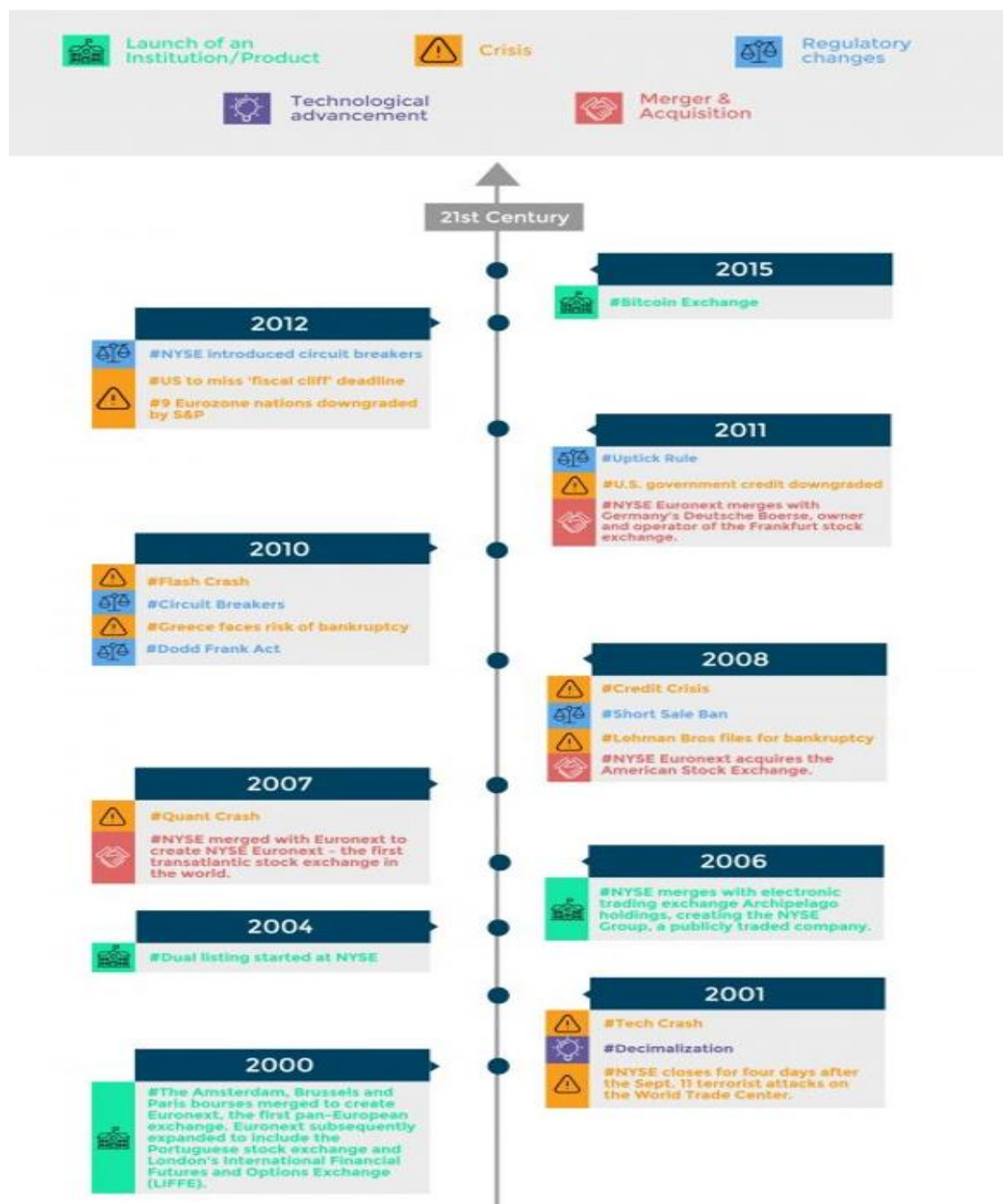
With growing speed of trade, this buying and selling of stocks and shares also travelled across the globe and in the late 1700's a small trade of merchants made a *Buttonwood Trade Agreement*. The men meet daily to buy and sell stocks and bonds, this practice eventually came to form the *New York Stock Exchange* in 1792.

The Philadelphia Stock Exchange was America's first stock exchange, despite the fact that the Buttonwood dealers are credited with creating the country's largest stock market. The Philadelphia Stock Exchange, established in 1790, had a significant influence on the city's position in the world economy, contributing to the growth of the financial industry in the United States and its westward spread.

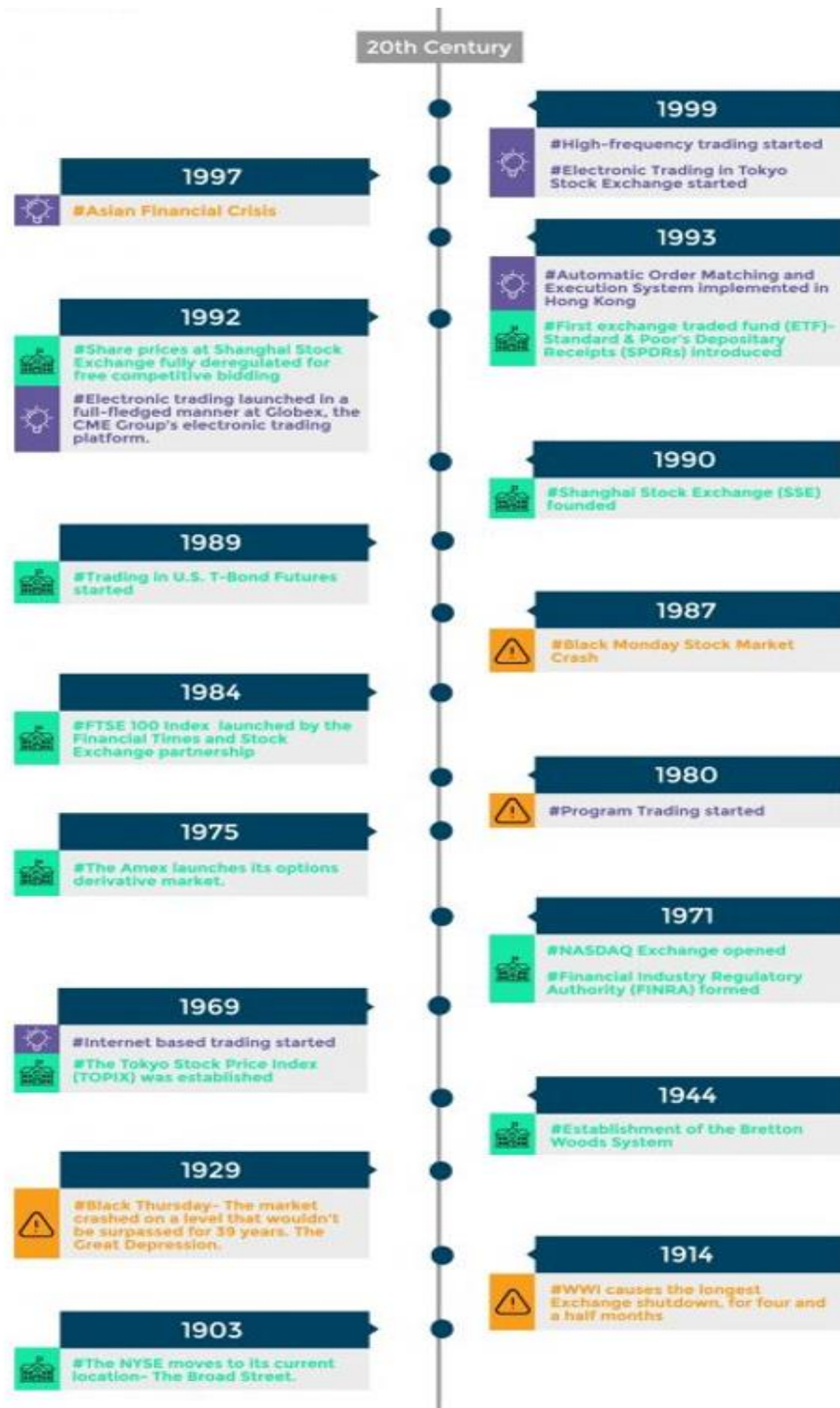
Another American stock exchange, the National Association of Securities Dealers Automated Quotations, or NASDAQ, started trading in 1971. It partnered with the London-based International Stock Exchange in 1992. This connection established the first global securities market.

At present, the biggest stock exchange in the world is the NYSE. Yet, domestic and foreign equities are now traded on exchanges in significant cities around the world.

They include the stock exchanges in London and Tokyo. Other major exchanges may be found in countries like China, India, Canada, Germany, France, and South Korea.







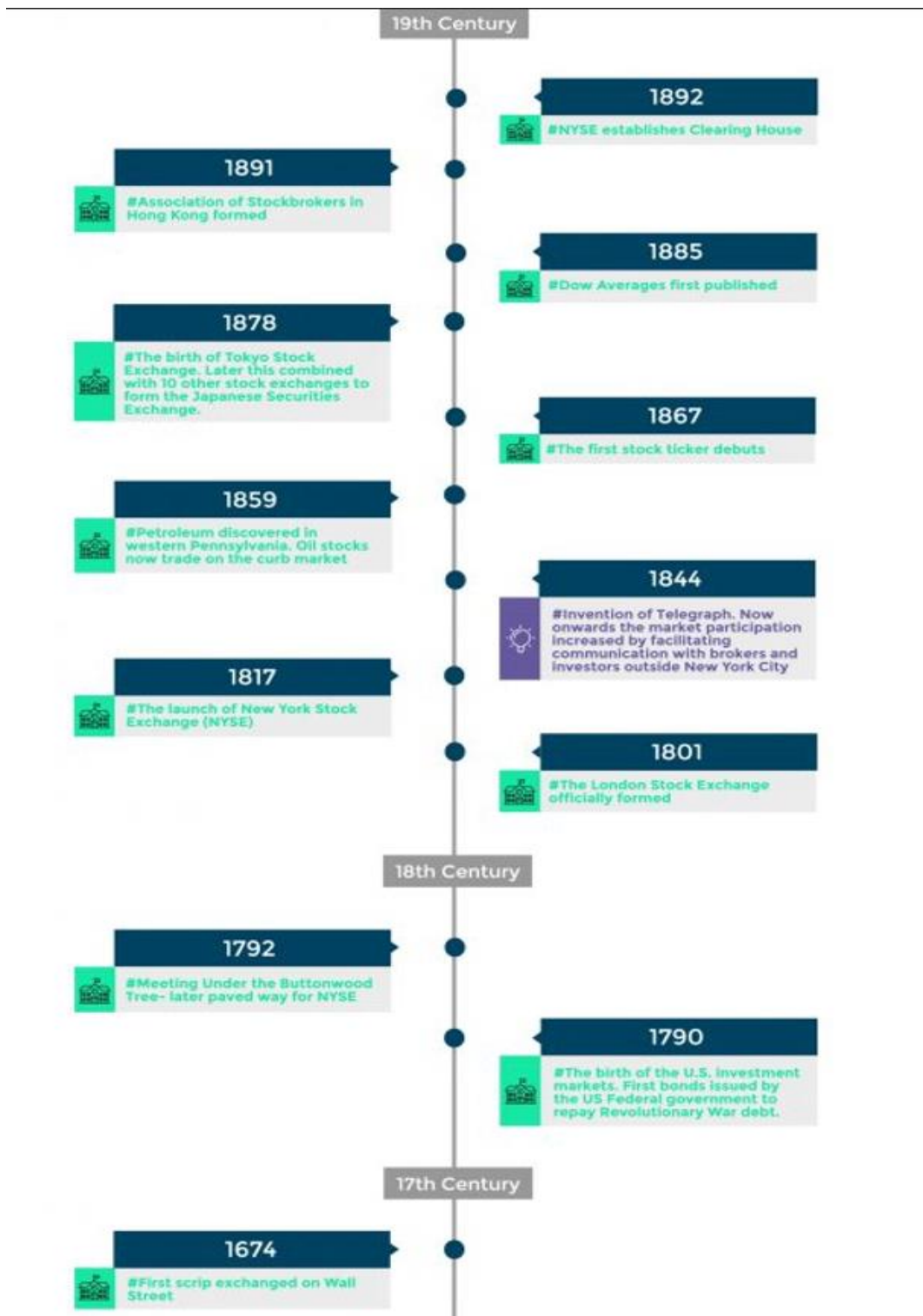


Figure 1.1 Evolution of stock markets around the globe

Source:- <https://www.sofi.com/learn/content/history-of-the-stock-market/>

Talking of existence of stock exchanges in India, The East India Company started dealing in loan securities in the 18th century, which is when stock trading in India first started. Corporate stock began trading in Bombay later in the 1830s with bank and cotton press stock.

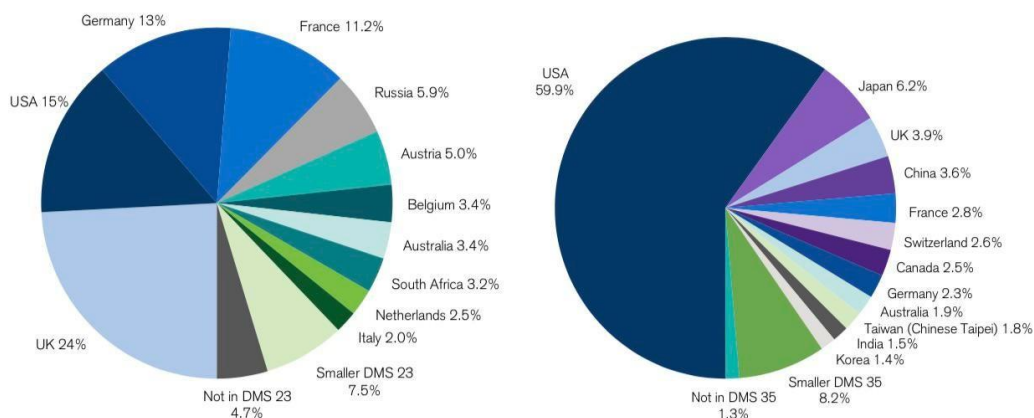
Informally operating stock exchanges were first established in India in the 1850s when 22 stockbrokers started trading in front of the Bombay Town Hall under a banyan tree. The number of brokers increased over time as they relocated frequently, until settling in 1874 at the location now known as Dalal Street.

BSE dominated the trade volume after independence. But, the lack of transparency and shaky clearing and settlement procedures made a financial market regulator even more necessary. Then, the Sensitivity Index (Sensex) was introduced in 1986.

Another major Indian stock exchange National Stock Exchange came into existence in the year 1992 and started trading in 1994.

The BSE is currently ranked as the eleventh largest stock exchange in the world, with an estimated market capitalisation of \$1.7 trillion. Around \$1.65 trillion is thought to be the market cap of the NSE. The Nifty50 is the NSE's main benchmark index, and the Sensex is the BSE's.

**Figure 2: Relative sizes of world stock markets, end-1899 (left) versus start-2022 (right)**



Sources: Elroy Dimson, Paul Marsh and Mike Staunton, DMS Database 2022, Morningstar; data for the right-hand chart from FTSE Russell All-World Index Series Monthly Review, December 2021. Not to be reproduced without express written permission from the authors.

Credit Suisse Global Investment Returns Yearbook Summary Edition 2022

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**Figure 1.2 Change in Relative size of stock markets around the globe**

Source: - <https://www.credit-suisse.com/in/en.html>

The above figure well depicts that Indian stock markets have gained volume in the last two decades itself, the number of traders and investors have expanded exponentially in the last 20 years, making it among top 15 world stock markets.

The evolution of Stock Markets and Relative shares of different countries all around the globe show that US has been the nation where the boom of the stock markets began by setting up of the New York Stock Exchange (NYSE) and the size of the US stock exchange forms around 60% of the total size of stock exchanges all around the globe.

However, India, with growing awareness to stock markets, investments have become one of the new countries in the last 20 years with stock exchanges. The image below shows India taking up 2<sup>nd</sup> position in “Countries Obsessed with Stocks”.

Country	Stocks	Buy stocks	Invest in stocks	Stock market	Interest rate	Day trading	Swing trading	Total search score
Singapore	100	100	61	72	100	71	51	555
India	70	79	45	91	78	35	94	492
Canada	84	78	91	68	50	54	37	462
United States	65	71	100	100	30	61	26	453
UAE	47	57	55	53	31	57	74	374
Australia	40	33	52	37	47	100	29	338
South Africa	22	22	40	13	43	60	54	254
New Zealand	34	30	52	29	24	49	27	245
UK	40	28	48	25	27	34	22	224
Nigeria	13	20	31	18	16	45	75	218

Figure 1.3: Countries Obsessed with Stocks

Source: - <https://www.businesstoday.in/>

India's equities market has become one of the largest in Asia and among the top five in the world, with a market capitalization of Rs 281.18 lakh crore for 5,309 businesses. In 2022, the Indian stock markets beat the majority of other global markets, giving investors respectable returns of more than Rs 16.36 lakh crore by the end of 2022, measured in terms of market capitalization.

## THINGS TO KNOW ABOUT THE INDIAN STOCK MARKET

The Indian stock market is unique in several ways. It is one of the oldest stock market in Asia. Since its inception, the Indian stock market has been expanding rapidly to become an attractive investment avenue for investors across the globe. Here's what makes the Indian stock market distinctive:-



Figure 1.4 Facts about Indian Stock Market

Source: <https://www.angelone.in/knowledge-center/share-market/share-market-basics>

## 1.2 Astrology

Astrology includes a number of divinatory activities that differs all around the globe and has been called pseudoscientific since 18<sup>th</sup> century. It involves the study and interpretation of the **fixed stars, the Sun, the Moon, and the planets** in order to predict terrestrial and human events. Devotees hold the belief that by comprehending how the planets and stars affect earthly affairs, one can forecast and control the fates of individuals, groups, and nations.

Most, if not all, cultures have placed value on what they see in the sky, and some—like the Mayans, Chinese, and Hindus—have created sophisticated methods for predicting events on Earth based on celestial observations. One of the oldest still-practicing astrological systems, Western astrology, has roots in Mesopotamia, which dates to the 19th to the 17th century BCE. From there, it travelled to Ancient Greece, Rome, the Islamic world, and ultimately Central and Western Europe. The majority of astrologers rely on horoscope systems that claim to explain parts of a **person's personality** and anticipate critical events in their life based on the locations of celestial objects. These systems are frequently connected with contemporary Western astrology.

Since centuries, a separate relation has been assumed between the movement of sun, moon and other celestial bodies and process of decay of various elements of fire, water, air and earth. In several ways, the divine plays a part in astrological theory. Astrology was vehemently opposed by orthodox Christianity and Islam initially because it assumes a wholly mechanistic universe, rejecting the possibility of divine intervention and human free will. Other people, however, believe that astrology is not a precise science like astronomy, but rather only a system of trends and directions that can be changed by the will of God or by the will of man. However, with changing time, According to Bardesanes' interpretation, the soul is free to choose between the **good and the evil** since only the elemental world is governed by the motions of the stars. **Bardesanes** was a **Syrian Christian scholar** who lived from 154 to 222 and is frequently referred to as a Gnostic (a follower of esoteric salvatory knowledge and the belief that matter is evil and spirit good).

Thus, although westerners have termed astrology as pseudoscience and have more belief in dynamics and physics, astrology can be said far from over in western countries, for instance say USA.

Talking of India, astrology is still quite prevalent in all the cultures. As soon as a child is born an astrologically made horoscope is made that shows the impact of celestial bodies and their movement on the life and personality of the child. Also planetary movements are given important consideration in the country when taking important decisions of life like marriage, investment, purchase of property etc. All of the above well signifies the importance of astrology in the country.

Astrology is able to hold a spot among the sciences in some nations, such as India. The fact that several Indian universities grant advanced degrees in astrology speaks to its continuing acceptability. Newtonian science and Enlightenment rationality, however, effectively eliminated the general belief in astrology in the West. Despite this, **Western astrology is still very much alive today** as evidenced by the significant increase in popularity it experienced in the 1960s.

The relationships for the chosen event's time and location are expressed visually in the horoscope. Similar connections exist between the twelve zodiac signs, the twelve houses, and the seven "planets," which stand for characteristics like love and war. As viewed from the given location, each planet is in a certain sign and house at the chosen time, resulting in two different types of relationships.

The foundation of Indian astrology are the Vedas which helps in coming forward with connection between the planetary movements and an individual. It is quite different from that of the western counterpart which are based on Hellenistic astrology in which adjustments are made through a gradual process.

### 1.3 Mercury Retrograde

Mercury Retrograde, as per the astrologers all around the globe is an astrological phenomena which happens when the quickly moving planet Mercury—which takes 88 days instead of Earth's 365 to orbit the Sun—appears to slow down. Around the Sun, planets migrate from East to West. Mercury appears to move "backwards," from West to East, during Mercury retrograde. This phenomenon is expected to happen three to four times during a given year. After a period of three and a half week it starts to move forward again. However, many has considered this only to be an optical illusion where mercury doesn't actually move backwards, it just overtakes the earth while completing its orbit around the sun. Often believed that, an outer planet that the Earth passes over temporarily appears to be moving backward in relation to the stars. The same mechanism that causes Mercury and Venus to become retrograde also causes them to move backwards. When they lap us, Mercury and Venus seem to go into retrograde.

Despite the fact that such illusions have been caused due to lapping of inner planets, astrologers assert that this remote celestial phenomenon has effects here on Earth and mercury is called as per a Greek astrologer is a “messenger of communication”. The aspects of life that **Mercury** often rules smoothly—such as **travel, communication, and technology**—are **disturbed** during this period of apparent retrograde mobility. In astrology, there is a common phrase that is often said “As above, so too below”. This implies that there is a fractal relationship between human activity on Earth and heavenly orbits. This notion permeates all of astrology and is a very useful one to remember.

People should postpone performing critical business at this time, according to proponents of Mercury retrogrades evil influence, who attribute everything from disputes to missing mail or luggage to car accidents and technological problems to the phenomena. Thus, in different cultures and different aspects the mercury retrograde has not been considered as an auspicious event and have been warned to cause confusion and has been often suggested as a period to avoid **travel, communication** and **investments**.

Mercury also governs trade and business, so avoid making any expensive purchases or sales while it is in retrograde. Frequently, you'll discover that the item



you seek is sold out. You can come to regret your purchase if you do make an expensive purchase, such as a car, computer, or piece of jewellery. If you're buying or selling a home, be prepared for issues, mistakes, delays, and setbacks. Only when returning something you already purchased may you make a pricey purchase during a retrograde period.

Throughout the year, Mercury goes into retrograde in three different zodiac signs. Delays and disappointments will be considerably more obvious than usual if it retrogrades in your sign. Try to be even more diligent in this situation and carefully review any suggestions, concepts, creative endeavours, and other plans to identify any weaknesses or false presumptions. Always go above and beyond to uncover faults when a retrograde is in effect. These times necessitate a methodical and intentional approach.

Astrologers consider rather than going forward and doing new things and investments this period must be considered as a time to:-

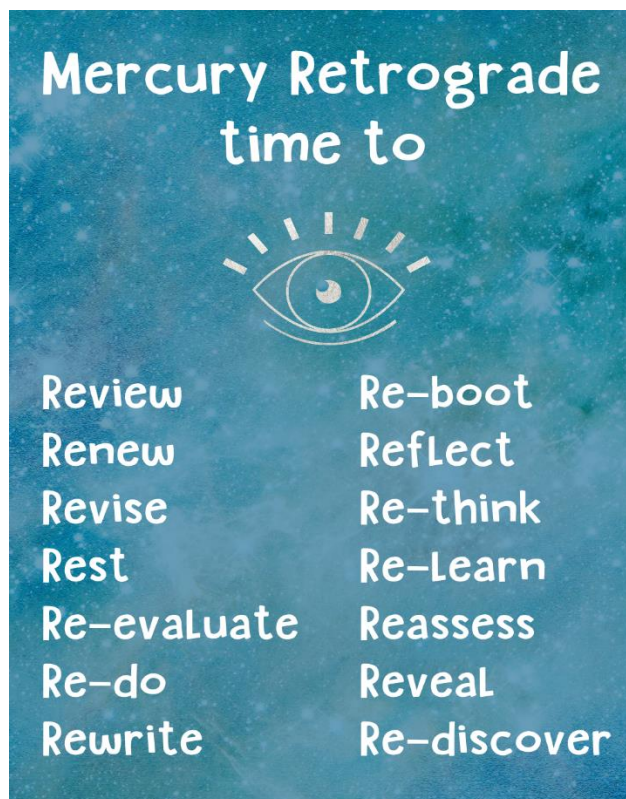


Figure 1.5 Things to do during mercury retrograde

Source: - <https://www.farmersalmanac.com/mercury-retrograde>

## 1.4 Financial Astrology & Trading Activities

Financial Astrology often referred to as astro-economics is considered to be a pseudoscientific practice of linking the movement of celestial bodies like sun, moon and other planets like Venus, Mars and Mercury to the events that take place in the financial markets.

This concept of linking astrological events with utterly pure events of forecasting investing and trading is not new. It is believed the heavenly movement of the celestial bodies which impacts the human beings and their decision making powers are bound to have a strong impact on the financial markets and trading activities, the investment decision of which is taken by human beings.

A proof of this is a publication by the name of Wall Street Forecaster was recognised as one of the best predictors on Wall Street in 1992, 1994, and 2008, when superstition was believed to bring good fortune. In 2002, it was ranked as the forecaster with the second best performance. Some customers reportedly requested that their copies be delivered on "brown paper" to avoid jeers. According to the Astro Fund Trading Company, which managed investor assets worth \$3.5–\$5 million as of 2001, 10-15% of fund managers used their service or a business of a similar nature. The **US and Japan**, despite major population denying the belief in astrology, have accounted for the majority of the market demand for his service. During the financial crisis of 2000, businesses and investment bankers began to use the same service.

Many on the other hand have still criticised the use of same, however, one of the biggest name of the financial world Goldman Sachs, talked about the appropriation of the concept and relation between eclipses and markets in number of its paper around 1999.

Even JP Morgan, founder of Morgan Bank once quotes this *“Millionaires never use astrology but billionaires do”*

Financial astrology could seem like a waste of time and a bunch of gibberish to sceptics. There is evidence, nevertheless, that astrology may have some application in the worlds of trade and finance.

It has been suggested a number of times by certain big names in the financial world that financial astrology must be accompanied along with traditional tools before making an investment or a trading decision.

A book published few years back, that gained quite popularity among traders “A traders guide to financial astrology” stated that “A logical strategy would be to combine all the information, astrological and scientific, to build a comprehensive picture of what happened. Make a decision that supports that, such as selling the security or maintaining it, if the numbers indicate a price decline and the planets indicate a negative event is likely to occur.

You must choose which data to believe more strongly if the numbers indicate that everything is heading in the direction you want it to yet the company's ruling planet is in retrograde. There is no one-size-fits-all manual for astrology, and different cultures and religions may have distinct interpretations of certain concepts.”

### ***Mercury Retrograde and its impact on trading***

Since financial astrology seems to believe movement of celestial bodies majorly impact the trading activities. One of the movement considered important is that of the mercury when it goes into retrograde. As observed from Earth, Mercury appears to sluggishly advance through the zodiac, pause, then move backward three times a year (retrograde). Even if it is only an optical illusion, according to astrological tradition confusion and misunderstandings are common during Mercury retrograde periods. There is a long-held view that it is advisable to stay away from established plans during Mercury retrograde, signing contracts, forming partnerships, beginning new projects, or opening new stock market positions since the trades could be less effective and people are more likely to make mistakes.

While some astro traders prefer to avoid the markets entirely and **cease** all active **trading** while Mercury is retrograde, others prefer to try to use it for Mercury **retrograde-based strategies** because Mercury retrograde periods frequently coincide with trend reversals or with short-term countertrends in the context of larger market moves. Thus, a strong belief prevails among traders that mercury retrograde is set to impact the market volatility and therefore lead to changes in the market returns.

## CHAPTER 2

### LITERATURE REVIEW

According to Boner & Rajiva (2007) “It's complex and debatable to apply astrology in financial market analysis. It has been shown that the moon, sun, and other celestial bodies have an impact on your mood and the amount of serotonin in your brain. So, astrology now has the potential to be a valuable instrument for forecasting stock market developments.” Thus, seeing the impact of astrology and planetary movement on the trading activities can give some interesting results.

The first attempt to link the astrology to capital market gains has been by a well-known trader W.D. Gann in 1950's where he studied the gain of Saturn- Jupiter movements on the capital market gains and also suggested few strategies over the same. Although it was not much appreciated as few people had believed in financial astrology. With growing times and growing beliefs major relationship have been established for movement sun, moon or in other words the lunar movements. Although psychological and scientific studies have not proved any significant relationships, but the trading behaviour, market returns and investor results well predict a significant impact of lunar movements on the capital market returns.

Bost, T. (2012). *Mercury, money and the markets: profitable planetary cycles for short term astra-trading* was among the first individuals who had tried to prove a significant impact of mercury retrograde on the stock market returns. He states that “Mercury appears to sluggish, halt, and move backward as it moves through the zodiac (retrograde). Although though it is merely an optical illusion, according to astrological tradition, Mercury retrograde times are marked by confusion and misunderstandings. There is a long-held view that it is advisable to stay away from established plans during Mercury retrograde, signing contracts, forming partnerships, beginning new projects, or opening new stock market positions since the trades could be less effective and people are more likely to make mistakes. While some astro-traders prefer to refrain from trading and stay away from the markets entirely while Mercury is retrograde, others prefer to try to use it for Mercury retrograde-based strategies because Mercury retrograde periods frequently coincide with trend reversals or with short-term countertrends in the context of larger market moves.”

Talking of impact of mercury retrograde, a number of researchers all around the globe have stated and researched upon the fact, the mercury being the closest planet to the sun is considered to have a significant impact on human and its movement can impact the thinking and decision making skills.

As a result, Edward, 1970; Gillen, 1979; Bost, 2012; Boland, 2019 in their findings have all suggested that people are more likely to make poor decisions during Mercury Retrograde, such as signing bad contracts and putting up bad business strategies. Therefore, it is best to refrain from making decisions while Mercury is retrograde. 2 Because equity trading involves making decisions, astrology holds that investors would be better off avoiding the market to avoid making decisions.

The Greek mythology has also stated and well discusses the negative impact of the retrograde or illusionary backward movement of the planet mercury on human decision making skills. As per the mythology named after the Greek god Hermes which rules financial gain, commerce, communication, traffic, and boundaries and so the movement is bound to impact the same.

Crockford, 2018; Prado-Richardson, 2019 in their researches "*Prado-Richardson, T., 2019. Who needs astrology? Lifted Brow, The, 41, 65*" significantly mentioned that Whether or not investors believe in astrology, the real effect channel asserts that Mercury Retrograde has a real impact on people's economic and social activities. The Mercury/Hermes controls activities should suffer if Mercury Retrograde has a noticeable effect on social activities and can also lead to fundamental losses. Thus prohibition or avoiding investing and trading activities have often been suggested during such backward moving periods.

*Raymond Merriman* a famous astrologer, has, a number of times used mercury retrograde to study and analyse the performance of the financial markets. Thus, all of the above findings and literature presents a strong case for testing the impact of mercury retrograde on the stock market returns.

Considering the growing importance of financial astrology around the globe and the existing financial literature, the current paper aims to test the presence of abnormal returns in Indian (developing) and US (developed) capital markets during mercury retrograde periods and see if empirical results fit the astrological explanation about the concept.

## CHAPTER 3

### OBJECTIVE OF THE STUDY

With growing consideration of financial astrology, majorly about the impact of mercury retrograde, which by many, including some famous traders and investors is said to impact the decision making, thinking and communication skills of individual investors and traders. Previous studies of financial astrology have focused more upon the planetary movement of Venus, lunar movements and have been concluded to significantly impacting the return generated from the stock markets during these periods. However, the period of mercury retrograde often connected with period of misconceptions and miscommunication has been less explored to observe its impact on the stock market returns. Thus, this paper majorly aims to study the impact of this astrological effect on the capital markets return.

In order to study the impact of mercury retrograde on stock or capital market returns, the capital markets of two totally different economies have been selected.

With large number of believers in astrology, especially believers of mercury retrograde, the change in returns generated on two major stock exchanges of India, i.e. Bombay Stock Exchange (BSE) & National Stock Exchange (NSE) are being studied in this study to study the impact of this astrological effect on financial returns.

Apart from this, due to growing importance and dependence of traders on periods of retrogrades, returns generated on the major stock exchanges of world's largest economy, i.e., United States of America (NASDAQ & New York Stock Exchange) are also been analysed under this study in order to understand the impact of mercury retrograde on the stock market returns.

Thus the two major objectives of the study are defined as follows:-

- To see how the past stock market returns, along with the period of mercury retrograde impacts the returns generated in stock market, both in developed economy and a developing economy.
- To understand the behaviour adopted by the investors and traders during the period when mercury retrogrades, therefore creating some impact on the returns generated.

## CHAPTER 4

### RESEARCH METHODOLOGY

#### 4.1 Collection of Data

Now in order to study the presence of differences in returns during the mercury retrograde periods on two different nations, i.e. United States of America and India, the analysis is being conducted on the historical returns generated on the major stock exchanges of both the nations.

USA has been chosen for the study as, theoretically the country is considered to have the most efficient capital markets thus this kind of calendar effect is supposed to have less impact, however the growing importance of astrology makes the country a good case for the study. In order to understand this impact the data has been collected for indexes of two major stock exchanges of the country, namely, **New York Stock Exchange (NYSE) & NASDAQ**.

On the other hand, India where astrology has been quite in the cultural roots since ancient history and is considered before any important decision like marriages and investment, thus studying the impact of this astrological event on the returns generated during this period establishes a strong case. In order to understand this impact the data has been collected for indexes of two major stock exchanges of the country, namely, **Bombay Stock Exchange (BSE) & National Stock Exchange (NSE)**.

The historical data collected for all the four indexes for two different countries is for the period of 10 years ranging from January 1, 2013 to January 31, 2023. The data for the Indexes of the Indian stock exchanges have been collected from their official websites. For NIFTY 50, a benchmark index of NSE the data for last 10 years has been extracted from <https://www.niftyindices.com/reports/historical-data>. On the other hand, data for SENSEX, a benchmark index of BSE has been extracted from <https://www.bseindia.com/Indices/IndexArchiveData.html>.

That data for the indexes of major stock exchanges could not be retrieved from the official websites of USA's major stock exchanges thus the historical data for Nasdaq Composite (a benchmark index of NASDAQ) and Dow Jones Industrial Average (a benchmark index of NYSE) has been extracted from a reliable data source, Yahoo finance (<https://finance.yahoo.com/>).

## 4.2 Hypothesis of the Study

In order to test the impact of mercury retrograde on the stock market returns the data for the mercury retrograde days during the selected time frame has been extracted from, *Drik Panchang* (<https://www.drikpanchang.com/planet/retrograde/budha-retrograde-date-time.html>), a reliable source for astrological data which has been made keeping in mind Indian astrology and is in line with astrological data of Old Farmer's Almanac. The data for this categorical variable will be used in the model using the dummy variables as the proxy for this astrological effect. The dummy variables to be used as mentioned as follows:-

0 = No Mercury Retrograde day

1 = Mercury Retrograde day

For the concerned study a model has been built keeping in mind the necessary assumptions and the dummy variables. The main assumption that has been made in the proposed model is that the current difference in the returns depends not only on the previous return but apart from it, also depends on the past returns that are bound to impact the investors or a trader's investment decision, impacting volatility, and therefore impacting the returns. Thus, dynamic character of return series has been considered along with dummy variables while considering the impact on the differential returns of a specific index. The proposed model is explained as follows:-

$$\mathbf{DR}_n \mathbf{Index}_t = c + \beta \mathbf{RIndex}_{t-1} + \sum_{n=1}^m \alpha_n \mathbf{DR}_n \mathbf{Index}_t + \gamma \mathbf{DMR}_t + \varepsilon_t$$

$c$  = Constant

$\mathbf{RIndex}_t = (\text{index closing price}_t - \text{index closing price}_{t-1}) / \text{index closing price}_{t-1}$

$\mathbf{DR}_n \mathbf{Index}_t = \mathbf{RIndex}_t - \mathbf{RIndex}_{t-1}$

$\mathbf{DMR}_t = \text{Mercury Retrograde Dummy Variable}$

$\beta, \alpha, \gamma = \text{coefficients}$

$\varepsilon_t = \text{standard error term}$



The above proposed model will be used to generate equation for all four indices and then run OLS regression on the generated equation. The hypothesis this study aims to test is defined as follows:-

H<sub>0</sub>: Mercury retrograde doesn't seem to have a significant impact on daily differential returns therefore traders believe in mercury retrograde and tend to avoid the markets during those periods.

H<sub>1</sub>: Mercury retrograde does seem to have a significant impact on daily differential returns therefore traders believe in mercury retrograde and tend to avoid the markets during those periods.

### **4.3 Analysis of Data**

Once the data of the closing price has been extracted for all the four major indices of two different nations, the closing prices were then used to compute the daily returns and then before beginning the hypothesis testing to check the impact of mercury retrograde on the returns, the generated series for all four indices were tested for stationarity using the Augmented Dickey- Fuller Test (ADF). This test is conducted before hypothesis testing as in the concerned study Ordinary Least Squares (OLS) regression will be used to examine the long term relations between the variables and reliable results can only be expected from OLS methods of regression when the variables being tested are at stationary level. Thus to avoid spurious regression and get reliable standard test (t-test, f-test) results the data is checked for its stationarity.

Once the return series has been checked for stationarity, the formulated hypothesis will be tested using the Ordinary Least Squares (OLS) method of regression on the models developed for each of the four indices using the proposed model. The regression analysis will be carried out on **GRET**L, an open source software which is predominately used for econometric analysis. GRET L stands for "Gnu Regression, Econometrics and Time Series Library" and has been used as is a software that doesn't require any advanced knowledge of programming languages. The regression analysis then carried out will help us to understand how mercury retrograde impact the market volatility and returns generated.

## CHAPTER 5

### DATA ANALYSIS & INTERPRETATION

The hypothesis testing to see the impact of mercury retrograde on stock market returns will be covered under this section. The stock return calculated from each of the four major indices, two of America and two of India will be undergoing a stationarity test and then the model equation will be prepared for each indices using the proposed model. After this the OLS regression analysis will be conducted in GRETL to see how past returns and mercury retrograde (incorporated through the use of dummy variables) impact the differential returns generated, for a given period of last ten years.

#### 5.1 NIFTY50 (National Stock Exchange)

In order to test the impact of mercury retrograde on the returns generated from NIFTY50, the data of the closing prices of NIFTY50 has been obtained for the period of January 1, 2013- January 31, 2023. Once the closing prices have been obtained, they have been used to calculate the daily returns. The formula used to calculate the daily returns is mentioned as follows:-

$$RNIFTY_t = (\text{NIFTY closing price}_t - \text{NIFTY closing price}_{t-1}) / \text{NIFTY closing price}_{t-1}$$

Once the daily returns have been calculated, they are tested for stationarity through Augmented Dickey Fuller Test (ADF). The hypothesis developed for ADF test are mentioned as follows:-

$H_0$ : NIFTY return series has presence of unit root or series is non- stationary

$H_1$ : NIFTY return series doesn't have unit root or the series is stationary

The ADF test is conducted on GRETL and the significance level is taken to be 95%, so if the obtained p-value will be less than 0.05 then we will not accept the null hypothesis and accept the alternative hypothesis.

The results of ADF test for RNIFTY are as follows:-

```

gretl: ADF test
Augmented Dickey-Fuller test for RNIFTYt
testing down from 26 lags, criterion AIC
sample size 2484
unit-root null hypothesis: a = 1

with constant and trend
including 11 lags of (1-L)RNIFTYt
model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + ... + e
estimated value of (a - 1): -0.93493
test statistic: tau_ct(1) = -13.874
asymptotic p-value 2.389e-37
1st-order autocorrelation coeff. for e: 0.001
lagged differences: F(11, 2470) = 5.963 [0.0000]
  
```

Figure 5.1: ADF test for RNIFTY

The above results show that the asymptotic p-value is less than 0.05, as a result the null hypothesis is rejected and therefore **NIFTY return series** does not have presence of unit root or the series can be said **stationary**.

Now, since the variable series have proved to be stationary, the hypothesis testing to study the retrograde impact on the return generated from the benchmark. The equation based on the proposed model for the discussed benchmark is mentioned as below:-

$$DR_n NIFTY_t = c + \beta RNIFTY_{t-1} + \sum_{n=1}^m \alpha_n DR_n NIFTY_{t+\gamma} DMR_{t+\varepsilon_t}$$

The proposed model for NIFTY50 while testing exhibited that apart from the previous day return, the former differences are significant for the present differences in return, the model quality is assumed to increase when more past differences are introduced showing how longer volatility history included in the model better explains the present volatility. Apart from the past differential returns the model also constitute for the major categorical variable in form of dummy variables to study the impact of mercury retrograde. The results of OLS regression are represented as follows:-

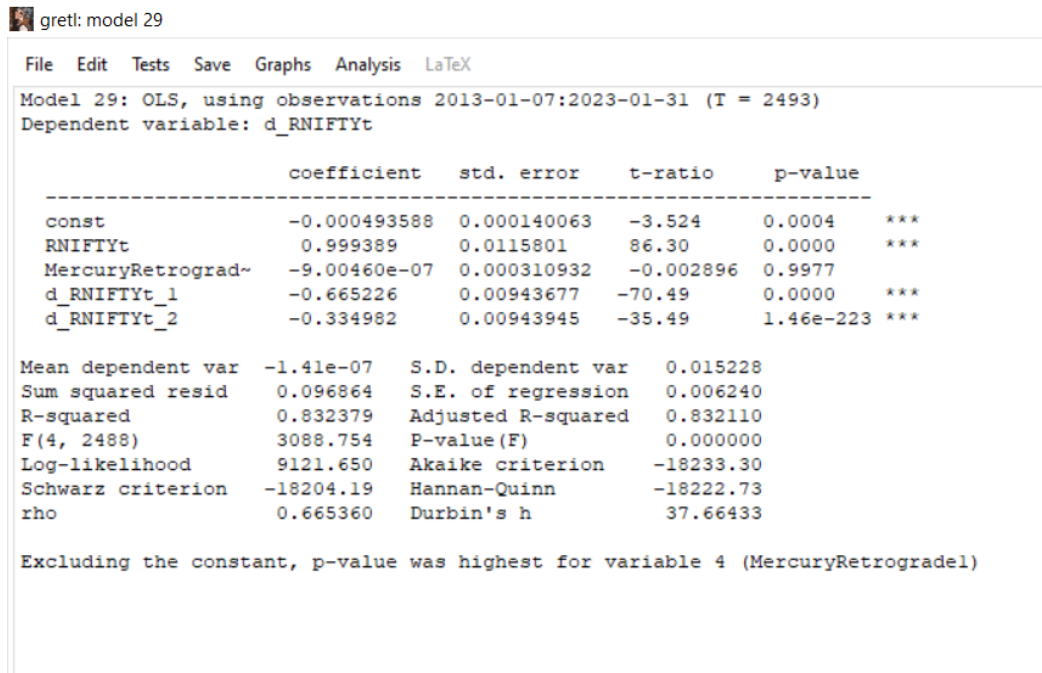


Figure 5.2: Regression result with two former differences in consideration

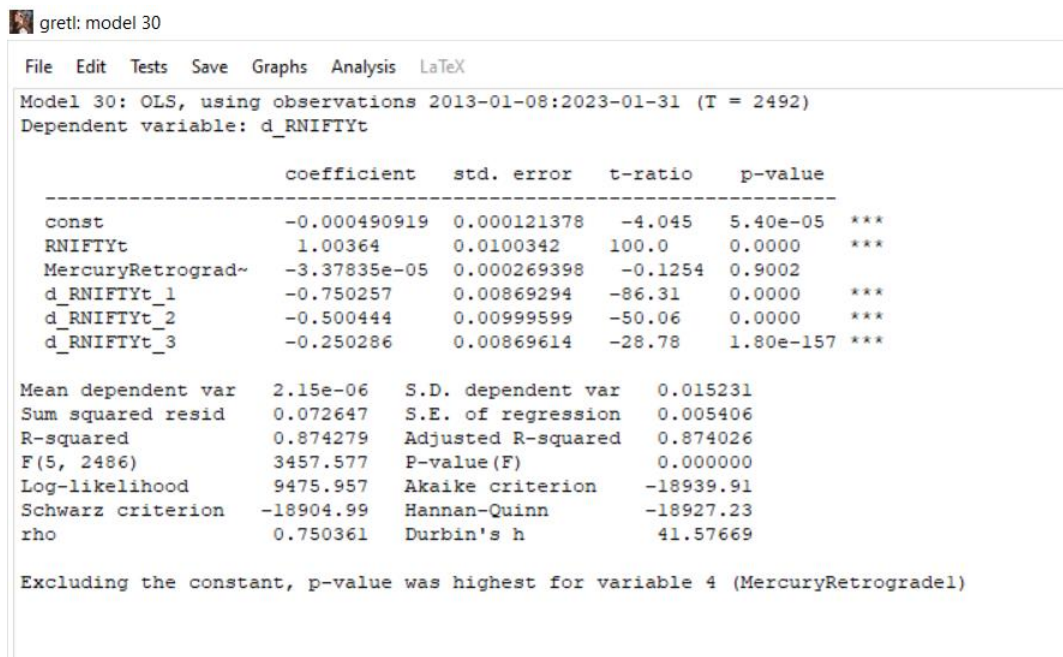


Figure 5.3: Regression result with three former differences in consideration

All the above regression results make one thing clear that as and when more past differences are introduced the model becomes better explained. This can be seen through constantly increasing R-squared value in each regression model depicted above. The introduction for more past values greater than three will give a much detailed model. Thus, longer volatility history included in the model better explains the present volatility. The optimal lag through VAR lag selection model has been found out to be eight lags and results of it are also presented as follows:-

```

gretl: model 3
File Edit Tests Save Graphs Analysis LaTeX
Model 3: OLS, using observations 2013-01-15:2023-01-31 (T = 2487)
Dependent variable: DRn

      coefficient      std. error      t-ratio      p-value
-----
const      -0.000497659      8.22633e-05      -6.050      1.67e-09 ***
DMR        -3.33581e-06      0.000182434      -0.01829     0.9854
RNIFTYt     0.994494          0.00686470       144.9        0.0000 ***
DRn_1      -0.888970         0.00649266      -136.9        0.0000 ***
DRn_2      -0.782306         0.00854663      -91.53        0.0000 ***
DRn_3      -0.665344         0.00967643      -68.76        0.0000 ***
DRn_4      -0.559407         0.0103160       -54.23        0.0000 ***
DRn_5      -0.440982         0.0103230       -42.72        3.25e-299 ***
DRn_6      -0.335521         0.00968311      -34.65        7.65e-215 ***
DRn_7      -0.218121         0.00855505      -25.50        1.60e-127 ***
DRn_8      -0.111108         0.00649596      -17.10        4.43e-062 ***

Mean dependent var  -4.61e-06  S.D. dependent var  0.015241
Sum squared resid   0.033149  S.E. of regression  0.003659
R-squared            0.942597  Adjusted R-squared  0.942366
F(10, 2476)         4065.789  P-value(F)          0.000000
Log-likelihood       10430.09  Akaike criterion    -20838.17
Schwarz criterion    -20774.16  Hannan-Quinn        -20814.93
rho                  0.888590  Durbin's h          46.83693

Excluding the constant, p-value was highest for variable 5 (DMR)

```

Figure 5.4: Regression result with eight former differences in consideration

Apart from this the major hypothesis of the model was to test the impact of mercury retrograde on the benchmark's return. So the p-value great than 0.05 (at a significance level of 95%) ensures the **acceptance of null hypothesis**. This brings us to the conclusion of NIFTY50 returns, that, mercury retrograde doesn't seem to have a significant impact on the daily differential stock returns, therefore traders trading on national stock exchange can be said not taking into consideration the mercury retrograde effect and not avoid the markets during those periods.

## 5.2 SENSEX (Bombay Stock Exchange)

In order to test the impact of mercury retrograde on the returns generated from SENSEX, the data of the closing prices of SENSEX has been obtained for the period of January 1, 2013- January 31, 2023. Once the closing prices have been obtained, they have been used to calculate the daily returns. The formula used to calculate the daily returns is mentioned as follows:-

$$R \text{ SENSEX}_t = (\text{SENSEX closing price}_t - \text{SENSEX closing price}_{t-1}) / \text{SENSEX closing price}_{t-1}$$

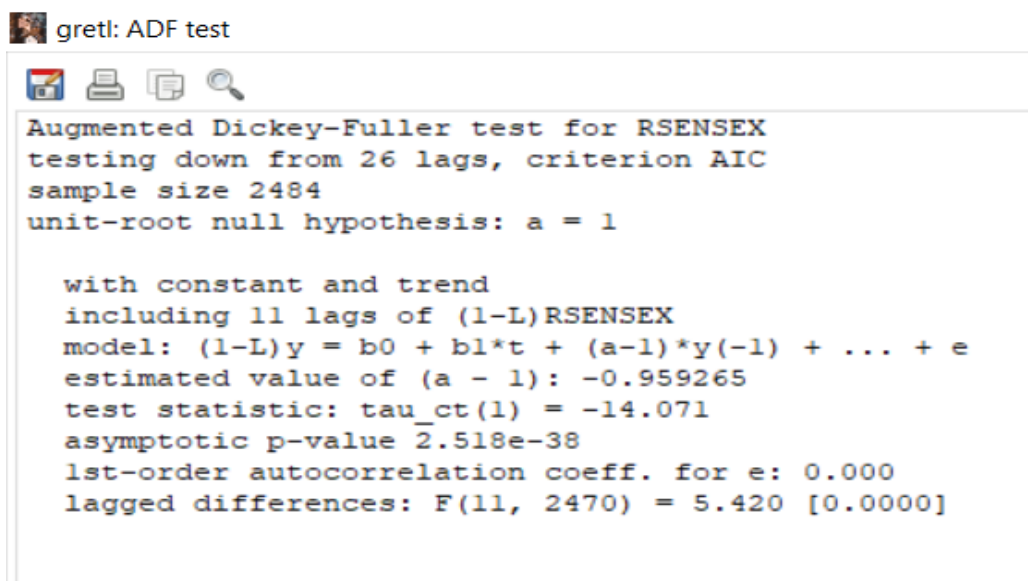
Once the daily returns have been calculated, they are tested for stationarity through Augmented Dickey Fuller Test (ADF). The hypothesis developed for ADF test are mentioned as follows:-

$H_0$ : SENSEX return series has presence of unit root or series is non- stationary

$H_1$ : SENSEX return series doesn't have unit root or the series is stationary

The ADF test is conducted on GRETL and the significance level is taken to be 95%, so if the obtained p-value will be less than 0.05 then we will not accept the null hypothesis and accept the alternative hypothesis.

The results of ADF test for RSENSEX are as follows:-



```
gretl: ADF test
Augmented Dickey-Fuller test for RSENSEX
testing down from 26 lags, criterion AIC
sample size 2484
unit-root null hypothesis: a = 1

with constant and trend
including 11 lags of (1-L)RSENSEX
model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + ... + e
estimated value of (a - 1): -0.959265
test statistic: tau_ct(1) = -14.071
asymptotic p-value 2.518e-38
1st-order autocorrelation coeff. for e: 0.000
lagged differences: F(11, 2470) = 5.420 [0.0000]
```

Figure 5.5: ADF test for RSENSEX

The above results show that the asymptotic p-value is less than 0.05, as a result the null hypothesis is rejected and therefore **SENSEX return series** does not have presence of unit root or the series can be said **stationary**.

Now, since the variable series have proved to be stationary, the hypothesis testing to study the retrograde impact on the return generated from the benchmark. The equation based on the proposed model for the discussed benchmark is mentioned as below:-

$$DR_n \text{SENSEX}_t = c + \beta \text{RSENSEX}_{t-1} + \sum_{n=1}^m \alpha_n \text{DR}_n \text{SENSEX}_{t+n} + \gamma \text{DMR}_{t+\epsilon_t}$$

The proposed model for SENSEX while testing exhibited that apart from the previous day return, the former differences are significant for the present differences in return, the model quality is assumed to increase when more past differences are introduced showing how longer volatility history included in the model better explains the present volatility. Apart from the past differential returns the model also constitute for the major categorical variable in form of dummy variables to study the impact of mercury retrograde. The results of OLS regression are represented as follows:-

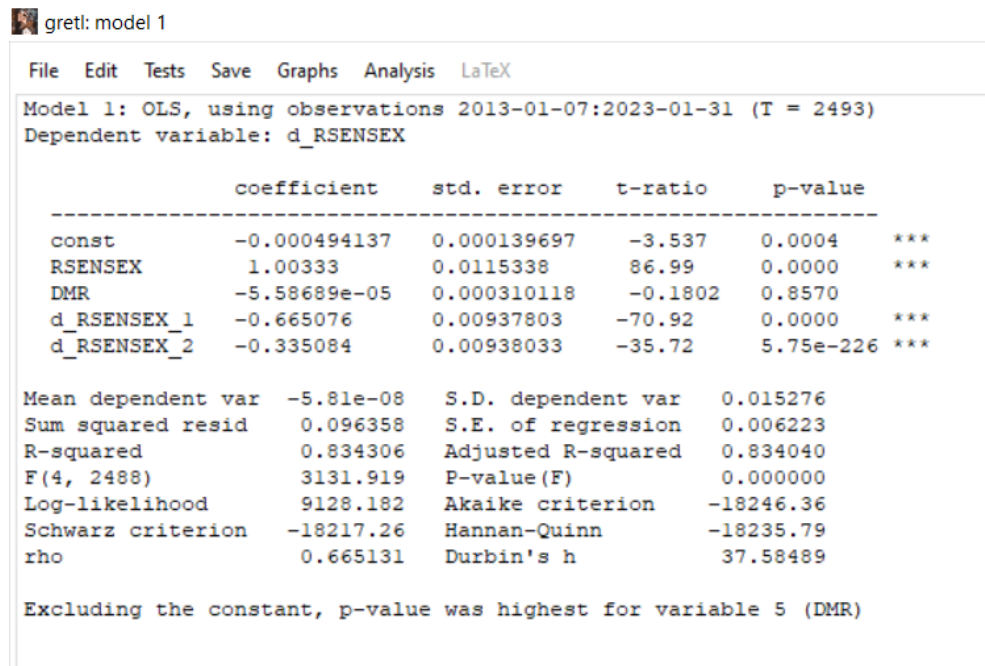


Figure 5.6: Regression result with two former differences in consideration

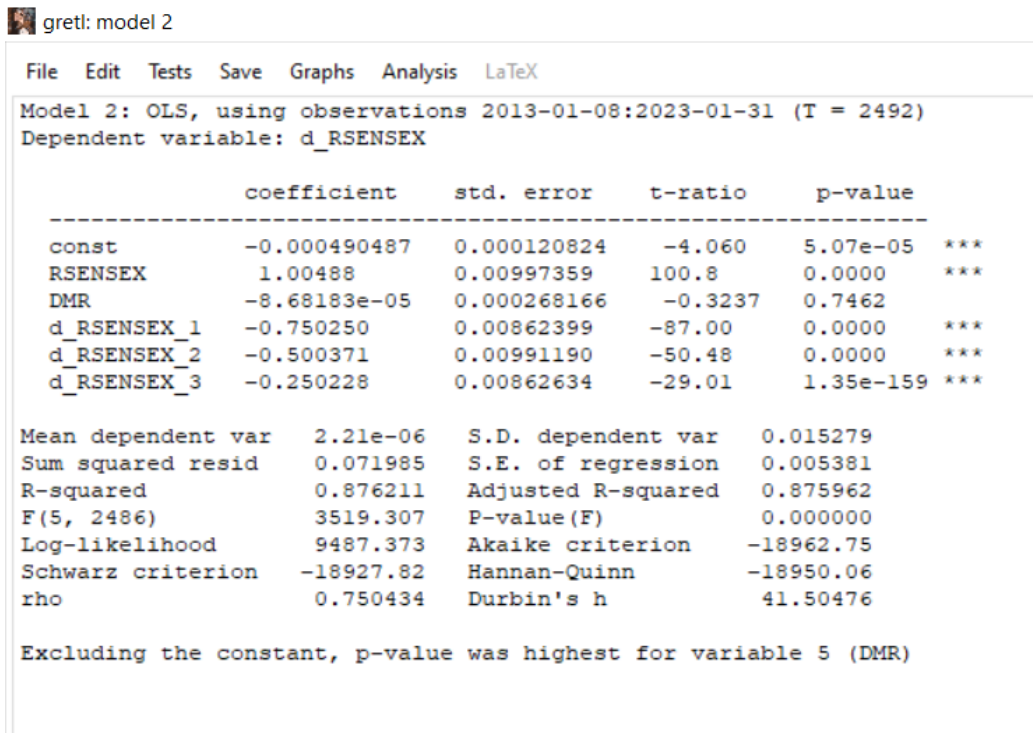


Figure 5.7: Regression result with three former differences in consideration

All the above regression results make one thing clear that as and when more past differences are introduced the model becomes better explained. This can be seen through constantly increasing R-squared value in each regression model depicted above. The introduction for more past values greater than three will give a much detailed model. Thus, longer volatility history included in the model better explains the present volatility. The optimal lag through VAR lag selection model has been found out to be eight lags and results of it are also presented as follows:-



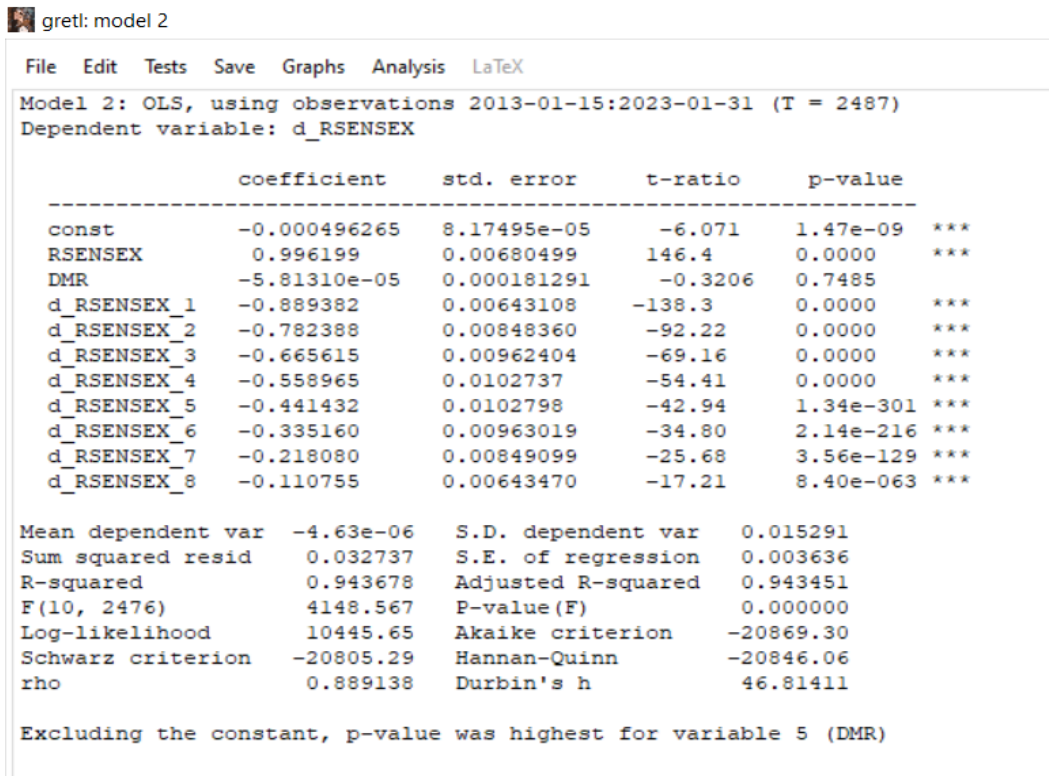


Figure 5.8: Regression result with eight former differences in consideration

Apart from this the major hypothesis of the model was to test the impact of mercury retrograde on the benchmark's return. So the p-value great than 0.05 (at a significance level of 95%) ensures the **acceptance of null hypothesis**. This brings us to the conclusion of SENSEX returns, that, mercury retrograde doesn't seems to have a significant impact on the daily differential stock returns therefore traders trading on Bombay stock exchange can be said not taking into consideration the mercury retrograde effect and not avoid the markets during those periods.

The regression models of NIFTY50 & SENSEX leads us to the conclusion that the impact of mercury retrograde on returns is not significant when tested for Indian stock markets as tested on the returns from the country's two major stock exchanges NSE & BSE . The results are quite surprising for the country that believes in astrology for every small occasion. However, a number of past literatures have substantiated less interest of Indian investors in retrograde motions before trading. As per *Yanling Qi, 2020. Long live Hermes! Mercury Retrograde and Equity Prices*. When searched for cross- sectional data for interest of investors on retrogratory motions, India did not have a much of a share. The authors seem to resonate this with less interest of Indian investors and traders on movement of mercury. Also, as per *Schwert, 2003*, there is a strong possibility that, as long as stock markets are aware of the anomaly there are chances for it to reverse or disappear. On the order hand the observed analysis can also be interpreted in a way where Indian investors misinterpreting the mercury retrograde causing substantial gain, so rather than reducing their investing activities they continue to invest with an aim to make substantial gains.

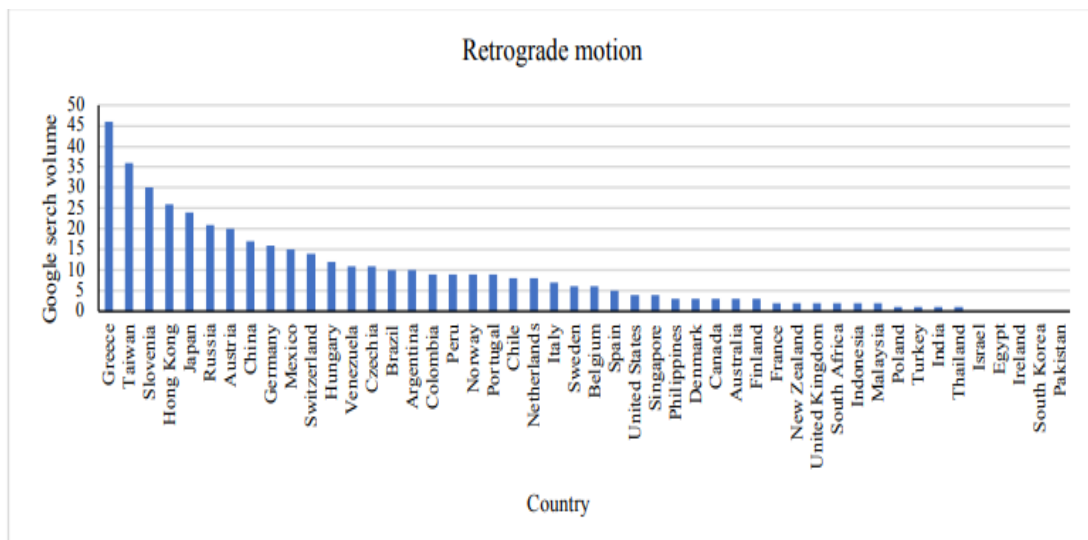


Figure 5.9: Interest in retrograde motion by region

Source: - <https://www.acem.sjtu.edu.cn/sffs/2021s/pdf/paper5.pdf>

### 5.3 NASDAQ COMPOSITE (NASDAQ)

In order to test the impact of mercury retrograde on the returns generated from NASDAQ COMPOSITE, the data of the closing prices of NASDAQ COMPOSITE has been obtained for the period of January 1, 2013- January 31, 2023. Once the closing prices have been obtained, they have been used to calculate the daily returns. The formula used to calculate the daily returns is mentioned as follows:-

$$R_{NASDAQ_t} = \frac{(\text{NASDAQ closing price}_t - \text{NASDAQ closing price}_{t-1})}{\text{NASDAQ closing price}_{t-1}}$$

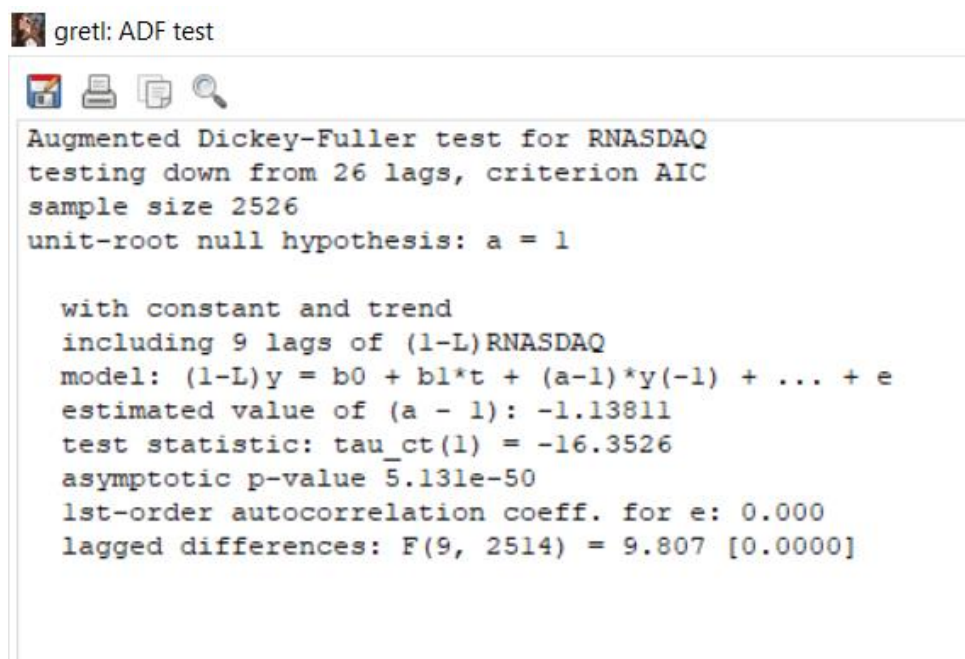
Once the daily returns have been calculated, they are tested for stationarity through Augmented Dickey Fuller Test (ADF). The hypothesis developed for ADF test are mentioned as follows:-

$H_0$ : NASDAQ return series has presence of unit root or series is non- stationary

$H_1$ : NASDAQ return series doesn't have unit root or the series is stationary

The ADF test is conducted on GRETL and the significance level is taken to be 95%, so if the obtained p-value will be less than 0.05 then we will not accept the null hypothesis and accept the alternative hypothesis.

The results of ADF test for RNASDAQ are as follows:-



```
gretl: ADF test
Augmented Dickey-Fuller test for RNASDAQ
testing down from 26 lags, criterion AIC
sample size 2526
unit-root null hypothesis: a = 1

with constant and trend
including 9 lags of (1-L)RNASDAQ
model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + ... + e
estimated value of (a - 1): -1.13811
test statistic: tau_ct(1) = -16.3526
asymptotic p-value 5.131e-50
1st-order autocorrelation coeff. for e: 0.000
lagged differences: F(9, 2514) = 9.807 [0.0000]
```

Figure 5.10: ADF test for RNASDAQ

The above results show that the asymptotic p-value is less than 0.05, as a result the null hypothesis is rejected and therefore **NASDAQ return series** does not have presence of unit root or the series can be said **stationary**.

Now, since the variable series have proved to be stationary, the hypothesis testing to study the retrograde impact on the return generated from the benchmark. The equation based on the proposed model for the discussed benchmark is mentioned as below:-

$$DR_n \text{NASDAQ}_t = c + \beta \text{RNASDAQ}_{t-1} + \sum_{n=1}^m \alpha_n \text{DR}_n \text{NASDAQ}_{t-1} + \gamma \text{DMR}_{t-1} + \varepsilon_t$$

The proposed model for NASDAQ while testing exhibited that apart from the previous day return, the former differences are significant for the present differences in return, the model quality is assumed to increase when more past differences are introduced showing how longer volatility history included in the model better explains the present volatility. Apart from the past differential returns the model also constitute for the major categorical variable in form of dummy variables to study the impact of mercury retrograde. The results of OLS regression are represented as follows:-

```

gretl: model 1
File Edit Tests Save Graphs Analysis LaTeX
Model 1: OLS, using observations 2013-01-08:2023-01-30 (T = 2533)
Dependent variable: d_RNASDAQ

```

	coefficient	std. error	t-ratio	p-value	
const	-0.000456211	0.000155829	-2.928	0.0034	***
DMR	-0.000788688	0.000344162	-2.292	0.0220	**
RNASDAQ	1.02714	0.0107471	95.57	0.0000	***
d_RNASDAQ_1	-0.680967	0.00878960	-77.47	0.0000	***
d_RNASDAQ_2	-0.316452	0.00874050	-36.21	1.31e-231	***
Mean dependent var	-7.38e-06	S.D. dependent var	0.019500		
Sum squared resid	0.123507	S.E. of regression	0.006990		
R-squared	0.871717	Adjusted R-squared	0.871514		
F(4, 2528)	4294.591	P-value (F)	0.000000		
Log-likelihood	8980.418	Akaike criterion	-17950.84		
Schwarz criterion	-17921.65	Hannan-Quinn	-17940.25		
rho	0.680519	Durbin's h	38.18974		

Figure 5.11: Regression result with two former differences in consideration

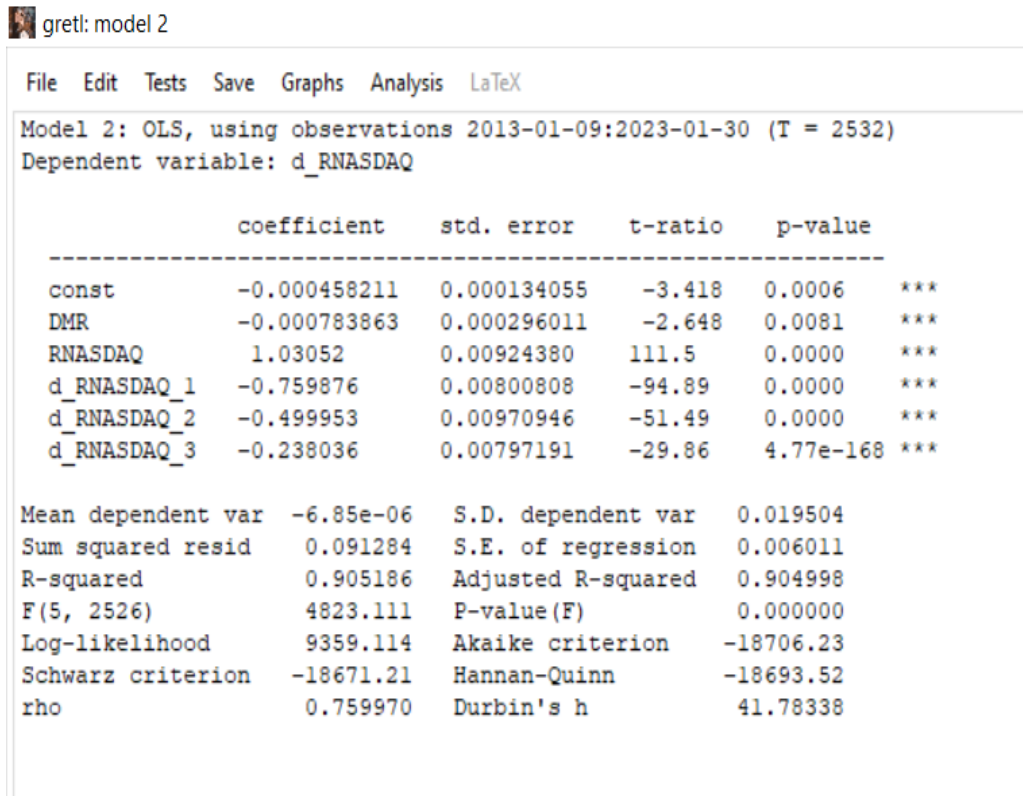


Figure 5.12: Regression result with three former differences in consideration

All the above regression results make one thing clear that as and when more past differences are introduced the model becomes better explained. This can be seen through constantly increasing R-squared value in each regression model depicted above. The introduction for more past values greater than three will give a much detailed model. Thus, longer volatility history included in the model better explains the present volatility. The optimal lag through VAR lag selection model has been found out to be ten lags and results of it are also presented as follows:-

gretl: model 1

File Edit Tests Save Graphs Analysis LaTeX

Model 1: OLS, using observations 2013-01-18:2023-01-30 (T = 2525)  
 Dependent variable: d\_RNASDAQ

	coefficient	std. error	t-ratio	p-value	
const	-0.000435369	7.73134e-05	-5.631	1.99e-08	***
DMR	-0.000793236	0.000170506	-4.652	3.45e-06	***
RNASDAQ	1.00936	0.00541412	186.4	0.0000	***
d_RNASDAQ_1	-0.914865	0.00516981	-177.0	0.0000	***
d_RNASDAQ_2	-0.825634	0.00723014	-114.2	0.0000	***
d_RNASDAQ_3	-0.731216	0.00831764	-87.91	0.0000	***
d_RNASDAQ_4	-0.643364	0.00903786	-71.19	0.0000	***
d_RNASDAQ_5	-0.546359	0.00933742	-58.51	0.0000	***
d_RNASDAQ_6	-0.454558	0.00935021	-48.61	0.0000	***
d_RNASDAQ_7	-0.357434	0.00903368	-39.57	1.50e-266	***
d_RNASDAQ_8	-0.268594	0.00834198	-32.20	1.02e-190	***
d_RNASDAQ_9	-0.174608	0.00724138	-24.11	9.98e-116	***
d_RNASDAQ_10	-0.0843986	0.00516374	-16.34	3.82e-057	***
Mean dependent var	-0.000010	S.D. dependent var	0.019530		
Sum squared resid	0.030086	S.E. of regression	0.003461		
R-squared	0.968747	Adjusted R-squared	0.968597		
F(12, 2512)	6488.615	P-value(F)	0.000000		
Log-likelihood	10731.00	Akaike criterion	-21436.01		
Schwarz criterion	-21360.16	Hannan-Quinn	-21408.49		
rho	0.914670	Durbin's h	47.59565		

Figure 5.13: Regression result with ten former differences in consideration

Apart from this the major hypothesis of the model was to test the impact of mercury retrograde on the benchmark's return. So the p-value less than 0.05 (at a significance level of 95%) ensures the **acceptance of alternative hypothesis**. This brings us to the conclusion of NASDAQ COMPOSITE returns, that, mercury retrograde seems to have a significant impact on the daily differential stock returns, therefore traders trading on NASDAQ can be said taking into consideration the mercury retrograde effect and avoiding the markets during those periods thus the reason behind fall in returns.

## 5.4 DOW JONES INDUSTRIAL AVERAGE (NYSE)

In order to test the impact of mercury retrograde on the returns generated from DJIA, the data of the closing prices of DJIA has been obtained for the period of January 1, 2013- January 31, 2023. Once the closing prices have been obtained, they have been used to calculate the daily returns. The formula used to calculate the daily returns is mentioned as follows:-

$$R_{DJIA_t} = (DJIA \text{ closing price}_t - DJIA \text{ closing price}_{t-1}) / DJIA \text{ closing price}_{t-1}$$

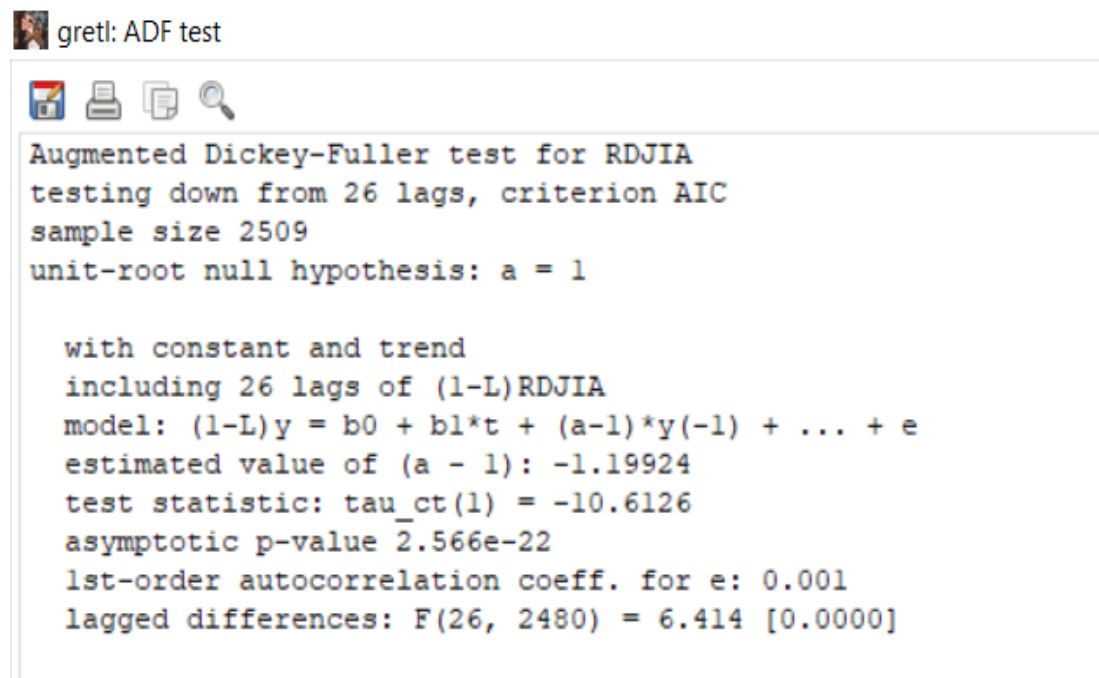
Once the daily returns have been calculated, they are tested for stationarity through Augmented Dickey Fuller Test (ADF). The hypothesis developed for ADF test are mentioned as follows:-

$H_0$ : DJIA return series has presence of unit root or series is non- stationary

$H_1$ : DJIA return series doesn't have unit root or the series is stationary

The ADF test is conducted on GRETL and the significance level is taken to be 95%, so if the obtained p-value will be less than 0.05 then we will not accept the null hypothesis and accept the alternative hypothesis.

The results of ADF test for RDJIA are as follows:-



```
gretl: ADF test  
Augmented Dickey-Fuller test for RDJIA  
testing down from 26 lags, criterion AIC  
sample size 2509  
unit-root null hypothesis: a = 1  
  
with constant and trend  
including 26 lags of (1-L)RDJIA  
model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + ... + e  
estimated value of (a - 1): -1.19924  
test statistic: tau_ct(1) = -10.6126  
asymptotic p-value 2.566e-22  
1st-order autocorrelation coeff. for e: 0.001  
lagged differences: F(26, 2480) = 6.414 [0.0000]
```

Figure 5.14: ADF test for RDJIA

The above results show that the asymptotic p-value is less than 0.05, as a result the null hypothesis is rejected and therefore **DJIA return series** does not have presence of unit root or the series can be said **stationary**.

Now, since the variable series have proved to be stationary, the hypothesis testing to study the retrograde impact on the return generated from the benchmark. The equation based on the proposed model for the discussed benchmark is mentioned as below:-

$$DR_n DJIA_t = c + \beta RDJIA_{t-1} + \sum_{n=1}^m \alpha_n DR_n DJIA_{t+n} + \gamma DMR_{t+n} + \varepsilon_t$$

The proposed model for DJIA while testing exhibited that apart from the previous day return, the former differences are significant for the present differences in return, the model quality is assumed to increase when more past differences are introduced showing how longer volatility history included in the model better explains the present volatility. Apart from the past differential returns the model also constitute for the major categorical variable in form of dummy variables to study the impact of mercury retrograde. The results of OLS regression are represented as follows:-

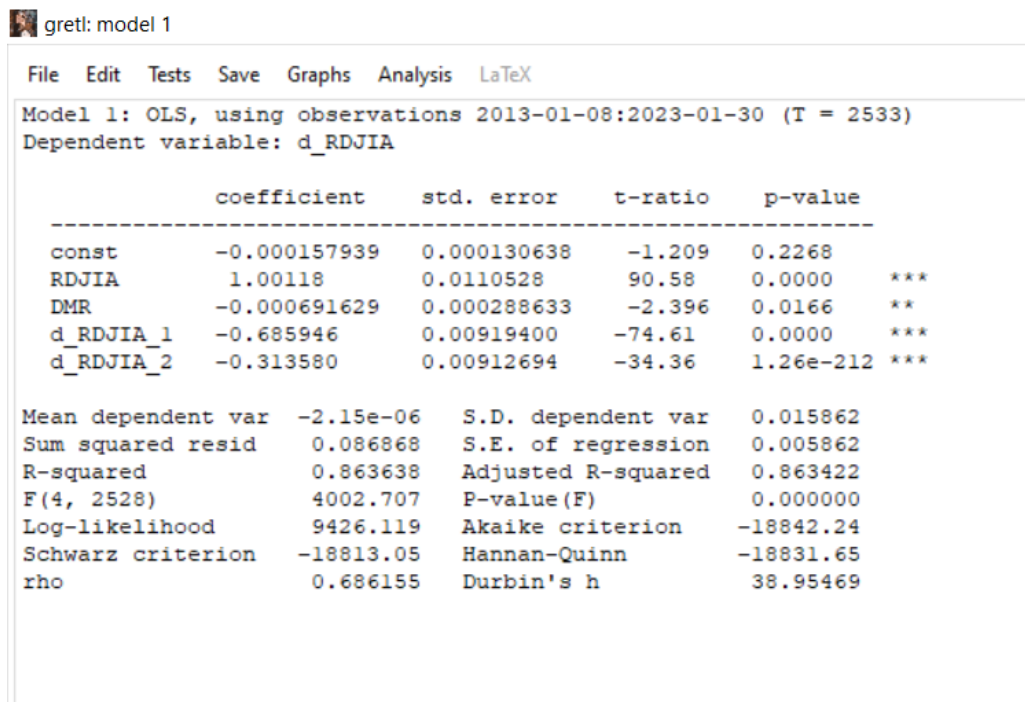


Figure 5.15: Regression result with two former differences in consideration



	coefficient	std. error	t-ratio	p-value	
const	-0.000167941	0.000114048	-1.473	0.1410	
RDJIA	1.02123	0.00967339	105.6	0.0000	***
DMR	-0.000669223	0.000251928	-2.656	0.0079	***
d_RDJIA_1	-0.761527	0.00846176	-90.00	0.0000	***
d_RDJIA_2	-0.500584	0.0103720	-48.26	0.0000	***
d_RDJIA_3	-0.237861	0.00844859	-28.15	6.48e-152	***
Mean dependent var	-2.07e-06	S.D. dependent var	0.015865		
Sum squared resid	0.066120	S.E. of regression	0.005116		
R-squared	0.896207	Adjusted R-squared	0.896002		
F(5, 2526)	4362.194	P-value(F)	0.000000		
Log-likelihood	9767.415	Akaike criterion	-19522.83		
Schwarz criterion	-19487.81	Hannan-Quinn	-19510.13		
rho	0.762776	Durbin's h	42.41947		

Figure 5.16: Regression result with three former differences in consideration

All the above regression results make one thing clear that as and when more past differences are introduced the model becomes better explained. This can be seen through constantly increasing R-squared value in each regression model depicted above. The introduction for more past values greater than three will give a much detailed model. Thus, longer volatility history included in the model better explains the present volatility. The optimal lag through VAR lag selection model has been found out to be eleven lags and results of it are also presented as follows:-

gretl: model 1

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Model 1: OLS, using observations 2013-01-22:2023-01-30 (T = 2524)  
Dependent variable: d\_RDJIA

	coefficient	std. error	t-ratio	p-value	
const	-0.000210279	6.45787e-05	-3.256	0.0011	***
RDJIA	1.00383	0.00557296	180.1	0.0000	***
DMR	-0.000419158	0.000142491	-2.942	0.0033	***
d_RDJIA_1	-0.919278	0.00535034	-171.8	0.0000	***
d_RDJIA_2	-0.833144	0.00744063	-112.0	0.0000	***
d_RDJIA_3	-0.755220	0.00858222	-88.00	0.0000	***
d_RDJIA_4	-0.673016	0.00921571	-73.03	0.0000	***
d_RDJIA_5	-0.589362	0.00976769	-60.34	0.0000	***
d_RDJIA_6	-0.499036	0.00979664	-50.94	0.0000	***
d_RDJIA_7	-0.409284	0.00977013	-41.89	2.83e-291	***
d_RDJIA_8	-0.325337	0.00921914	-35.29	7.05e-222	***
d_RDJIA_9	-0.243889	0.00859093	-28.39	5.47e-154	***
d_RDJIA_10	-0.165999	0.00744968	-22.28	1.63e-100	***
d_RDJIA_11	-0.0799658	0.00534409	-14.96	1.48e-048	***
Mean dependent var	-4.75e-06	S.D. dependent var	0.015886		
Sum squared resid	0.020977	S.E. of regression	0.002891		
R-squared	0.967056	Adjusted R-squared	0.966886		
F(13, 2510)	5667.737	P-value(F)	0.000000		
Log-likelihood	11181.38	Akaike criterion	-22334.77		
Schwarz criterion	-22253.10	Hannan-Quinn	-22305.13		
rho	0.919477	Durbin's h	47.95904		

Figure 5.17: Regression result with eleven former differences in consideration

Apart from this the major hypothesis of the model was to test the impact of mercury retrograde on the benchmark's return. So the p-value less than 0.05 (at a significance level of 95%) ensures the **acceptance of alternative hypothesis**. This brings us to the conclusion of DJIA returns, that, mercury retrograde seems to have a significant impact on the daily differential stock returns, therefore traders trading on DJIA can be said taking into consideration the mercury retrograde effect and avoiding the markets during those periods thus the reason behind fall in returns.

The regression models of NASDAQ COMPOSITE & DJIA leads us to the conclusion that the impact of mercury retrograde on returns is significant when tested for American stock markets as tested on the returns from the country's two major stock exchanges NASDAQ & NYSE . The results for these two stock exchanges were also quite surprising as Americans are not considered to be a sheer believer of astrology and the impact of retrograde movement on the returns generated from major stock exchanges indicate that investors and traders of the nation have started believing the effects of mercury retrograde, first stated by the Greek mythology and so believe in the negative impacts on decision making and communication during this astrological event.

A number of past literatures have suggested for traders and investors it is not always the culture that defines their investment making patterns., the awareness about a concept is also bound to impact the decision making activities, create psychological impact and therefore impact the returns too. *Forgas (1995)* well suggested that awareness of the concept makes the direction of the supposed effect opposite which can be seen while observing the impact of mercury retrograde on the returns generated from the US stock markets. The growing interest of people residing in the region of United States can be assumed through the results of the above hypothesis testing.

## **CHAPTER 6**

### **CONCLUSION**

In order to test the astrological beliefs about the mercury retrograde and its impact on humanly activities of decision making, communicating and investing, the study tested the impact of the event on the returns generated from the stock returns in two set of markets, i.e. India & USA, two countries with different set of astrological beliefs and cultures. The regression analysis done to test the hypothesis to see the significant impact of retrograde effect has shown different results for both the countries.

Ironically, the stock markets return from India, country which is supposedly considered the nation of supernatural beliefs and customs have shown no significant impact of the mercury retrograde movement. On the other hand, returns from the stock exchanges of USA, a nation where traders and investors are considered to be rationale and have recently gained interest in the retrograde motion of mercury can be seen significantly impacted by the motion of the planet.

Thus, the paper furnishes that although the returns of all the stock exchanges in the scope of this study exhibit a certain level of dependence on the past differential returns, however the investors and traders can be considered cautious in the American stock markets while making investment during the retrograde periods which shows an impact on the returns. However, no impact of the motion in Indian stock markets does not provide us with any such conclusions.

Such results have also been observed in past studies, where prior knowledge and applicability about the concept of an astrological event is said to have an opposite or reverse effect.

It's critical to keep in mind that outcomes of the study are depending on market returns. A better understanding of the relationship between Mercury Retrograde and the trading habits of individual investors can be observed in nations with ancient Greek cultures through further study at the level of individual trade. Future research can look into how other economic results are impacted by ancient cultures and astrological events.

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