

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics



Bachelor Thesis

Stock Market Analysis

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BACHELOR THESIS ASSIGNMENT

Parminder Singh

Economics and Management

Thesis title

Stock Market Analysis

Objectives of thesis

The objective of this thesis is to learn about stock market by analyzing the stock of the company called Apple. The goal is to learn about Stock trading using technical analysis.

Methodology

The Bachelor thesis is divided into Theoretical and practical parts. Theoretical part describes general information about stock market e.g. Stock exchange, Type of stocks, Type of Market and Stock trading, whereas practical part uses technical indicators for analyzing the trend in the stock. Indicators used are Relative strength Index, Moving average convergence divergence and Stochastic Oscillator.

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Declaration

I declare that I have worked on my bachelor thesis titled "Stock market Analysis" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 25/02/19

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Stock Market Analysis

Abstract

Stock Market has become one of the important parts of modern life, we see news everyday about how market is performing and how various factors like political and relation between countries affect the market. The purpose of this thesis is to gain general knowledge about stock market especially U.S.A market.

Theoretical part is focused on history of the market and general terms of the market that are required in the day to day life with the basic idea of what are stocks, types of stocks and Stock exchanges. Some information about leading Stock indexes and Stock exchanges like NYSE and NASDAQ is written in brief and discussion about how market impacts economy of the country. Then we move to what is Stock analysis and methods used to analyse stocks.

In practical part focus is on general understanding of 2008 market crash and analysing AAPL using technical analysis with the help of Moving averages and Technical Indicators. Indicators used are RSI, MACD and Stochastic Oscillator to understand how they can help individual to make investing decisions. Results of these indicators are described for their better understanding.

Keywords: Stock Market, Stocks, Stock index, Stock trading, Stock analysis.

Analýza akciového trhu

Abstrakt

Burza cenných papírů se stala jednou z důležitých částí moderního života, vidíme každodenní zprávy o tom, jak funguje trh a jak různé faktory jako politický a vztah mezi zeměmi ovlivňují trh. Cílem této práce je získat obecné znalosti o akciovém trhu, zejména o trhu v USA.

Teoretická část je zaměřena na historii trhu a obecné podmínky trhu, které jsou vyžadovány v každodenním životě se základní myšlenkou toho, co jsou akcie, typy akcií a burzy. Některé informace o předních akciových indexech a burzách, jako je NYSE a NASDAQ, jsou napsány v úvodu a diskusi o tom, jaký dopad má trh na ekonomiku země. Pak se přesuneme k analýze akcií a metodám používaným k analýze zásob.

V praktické části se soustředí na obecné porozumění havárii trhu v roce 2008 a analýze AAPL pomocí technické analýzy s pomocí pohyblivých průměrů a technických ukazatelů. Použité ukazatele jsou RSI, MACD a Stochastic Oscillator, aby se pochopilo, jak mohou pomoci jednotlivcům při rozhodování o investování. Výsledky těchto ukazatelů jsou popsány pro jejich lepší pochopení.

Klíčová slova: Akciový trh, akcie, akciový index, obchodování s akciemi, analýza akcií.

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List of abbreviations

- **AAPL** – Apple
- **NYSE** – New York Stock Exchange
- **NASDAQ** – National Association of Securities Dealers Automated Quotation
- **SEC** – Stock Exchange Commission
- **S&P** – Standard & Poor's
- **LSE** – London Stock Exchange
- **DJIA** – Dow Jones Industrial Average
- **IPO** – Initial Public Offering
- **SMA** – Simple Moving Average
- **EMA** – Exponential Moving Average
- **RSI** – Relative Strength Index
- **MACD** – Moving Average Convergence Divergence
- **ETF**- Exchange Traded Fund`

1 Introduction

Definition: Stock Market is a collection of Markets and Exchanges where the issuing and trading of equities, bonds and another sort of securities take place, either through formal exchanges or over-the-counter markets. The stock market is one of the most vital components of a free market economy.

1.1 What this thesis expects to accomplish

The purpose of this thesis is to understand the basics of stock market even for laymen. Here we will start from the history of stock market and end it with the modern stock market i.e. present day of the market. As we all know financial markets are major part of today's life whether it is about relations between two countries or for overall well-being of humanity. Day to day decisions of an individual can affect stock market performance. Most of the things we use today whether it is computer, clothing brands, vehicles, or any electronic applications all of them are part of the stock market. Introduction of cryptocurrencies also lead to introduction in investing. Some people even say that there is similarity between cryptos and stock market according to their trend. Even some investment professionals are keeping eye on cryptocurrencies. But that is different topic and we will not discuss about crypto in this thesis. We will only focus on traditional stock market.

2 Objectives and Methodology

2.1 Objectives

The objective of this thesis is to learn about future development of prices and recommendation for those who are willing to learn about investing. The practical part will focus on analysing the stock of the company called Apple. The goal is to learn about Stock trading using technical analysis.

2.2 Methodology

The Bachelor thesis is divided into Theoretical and practical parts. Theoretical part describes general information about stock market e.g. Stock exchange, Type of stocks, Type of Market and Stock trading, whereas practical part uses technical indicators for analysing the trend in the stock. Moving averages are used to analyse strength of the stock to understand Support and Resistance and to put stop-loss. Indicators used are Relative strength Index, Moving average convergence divergence and Stochastic Oscillator. We worked on the AAPL stock price data from the year 2018. Formulas used are:

$$RSI = 100 - \frac{100}{1 + RS} \quad (1)$$

$$RS = \text{Average Gain} / \text{Average Loss}$$

$$MACD = (12\text{day EMA} - 26\text{ day EMA}) \quad (2)$$

$$\%k = \frac{100(C - L14)}{(H14 - L14)} \quad (3)$$

Stochastic Oscillator uses %k and %D lines

$$\%k = 100(C-L14)/(H14-L14)$$

C = Most recent closing price

L14 = low of 14 previous trading sessions

H14 = highest of 14 trading sessions

%D = three period moving average of %k

3 Literature Review

The literature part is about the history of the stock market, types of stocks, Stock exchange, Stock indices, Stock trading and Analysis of stocks with basic information about Fundamental analysis and focusing more on Technical analysis using technical tools to analyse stocks.

3.1 History of Stock Market

The Birth of the stock market in general is difficult to imagine. The first genuine stock market did not arrive until the 1500s. There were plenty of early examples of the market which were like the stock market.

In the 1100s, France had a system where courtiers de change managed agricultural debts throughout the country on behalf of banks. This can be considered as the first example of brokerage. (FRIDSON, Martin S. 1998)

The world's first stock markets are generally linked back to Belgium. In the 14th century Italian companies were the first to issue shares. Bruges, Flanders, Ghent, and Rotterdam in the Netherlands all hosted their own stock market system in the 1400s and 1500s. (TRACY, James. 1985)

In the 17th and 18th century Dutch came up with several financial innovations that helped in laying the foundation of the modern financial system. In this time Italian city-states produced the first transferable bonds. In the early 1600s Dutch East India Company became the first company in history to issue bonds and shares of stock to the public. The company released its shares on Amsterdam Stock Exchange. The first business was conducted in coffee shops. Investors used to trade stocks with other Investors in coffee shops. The first Stock Market bubble burst after the formation of London Stock exchange as some companies stopped paying dividends to investors and the government of England banned the issuing of shares until 1825 and exchange was formed in 1801 but issuing of shares were banned till 1825. This prevented the London Stock Exchange from becoming a true Global superpower. Now creation of the New York Stock Exchange in 1817 was such an important moment in history. The NYSE has traded stocks since its very first day although NYSE was not the first exchange in

U.S. Philadelphia was holding a little bit in U.S market but NYSE soon became most powerful stock exchange in the country due to lack of any type of domestic competition and its positioning at the centre of U.S trade. (BROOKS, John, 1968)

3.2 What are Stocks?

Stock is a share in the ownership of the company. It represents a claim on the company's assets and income. The more stocks you have in a company, more will be your ownership stake. But stock holders do not own corporation, they own shares issued by corporations. Shareholder has no right to buy company's assets like building, computers etc. Corporate property is legally separated from shareholders property. If the company goes bankrupt, court may order to sell all assets of the corporation, but court cannot force shareholder to sell its shares, although value of shares will go down. Same, if shareholder goes bankrupt, he cannot sell company's assets to recover from creditors. Shareholders own shares issued by the corporation and corporation own assets. (LITTLE, Ken. 2012)

Owning stock gives you the right vote in shareholder's meetings, receive dividends i.e. company's profits when they are issued. Person who owns majority of shares has more voting power and he can indirectly control the direction of a company by appointing board of directors. Board of directors are responsible for hiring professional managers such as CEO of the company. Ordinary shareholders are entitled to a portion of company's profits. (ARTHUR, 2011)

3.2.1 Types of Stocks

Based on Ownership Rights

Common Stocks: People talking about stocks usually refers to common stocks because most of stocks are issued in this form. Common stock represents ownership in a company and claim on a portion of that company profits. Investors have the right to vote to elect the board of members who oversee the major decision made by management. The common stock yields higher returns than any other stock investments but also has a higher risk. If a company

goes Bankrupt, the common stock holders will not receive money until the creditors, bond holders and preferred shareholders are paid. (AMADEO, Kimberly. 2018)

Preferred Stocks: These types of stocks also represent ownership in a company but differs from common stocks such as preferred shareholders have no voting rights. These shareholders are granted with a fixed dividend, whereas in common stocks dividend changes with company profits. Preferred stocks holders do not enjoy appreciation in stock prices which leads to lower returns. But in the case of bankruptcy preferred shareholders are paid off before common shareholders. (HORTON, Melissa. 2018)

Hybrid Stocks: Companies also hybrid stocks, these kinds of stocks give opportunity to convert preferred stocks into fixed number of common stocks at a specified time, but they may not have voting rights like common stocks. They are also called “convertible preferred shares”. (MAHANTI, Pk. 2001)

3.2.2 Based on company specifics

Blue Chip Stocks: These types of stocks are the stocks of bigger companies. These are usually high-quality companies with years of strong profits and steady dividend payments. They are also some of the safest stocks to invest in. These companies are stable, so they do not have much scope to grow. (YAN, Yuxing. 2015)

Income Stocks: Income stocks are often related to blue chip stocks as they are stable companies paying higher dividends. These stocks are often bought by older people who are retired to provide them with a steady income stream in the form of dividends. Stock Price may change with the market. (ZWEIG, Jason. 2010)

Growth Stocks: These are the stocks of companies which are increasing their profits quickly. These companies often reinvest profits and pay little or no dividends to stock owners. Growth stocks can rise in value quickly, but they often fall even quicker.

3.2.3 Based on Price Trends:

Cyclical Stocks: Companies which are more affected by economic trends, their growth moderates in slow economy and fastens in booming economy. Hence, price of such stocks tends to fluctuate more as economic conditions change. For example, Automobile industry.

Defensive Stocks: These are opposite of cyclical stocks, as they are not so sensitive to economic conditions. For example, stocks in food industry, drugs and insurance sector. (The Economic Journal, 1936)

3.3 Stock Exchange

It is a place where buyers and sellers come together where stocks, bonds and other financial instruments are listed and traded. Stocks of larger companies are usually traded through exchanges. Securities traded on stock exchanges include stock issued by listed companies, unit trusts, derivatives, pooled investment products and bonds. Many stock exchanges are using electronic trading today, but the security must be located at one central location of the exchange, one on which it will be traded. In modern market electronic network give traders advantage of increased speed and reduced cost of transactions. IPO's of stocks and bonds to investors are done in the primary market and trading is done in the secondary market. The number of stocks exchanges handle every day is called volume. Such exchanges exist in major cities all over the world. In terms of market capitalization, the two biggest stocks in the United States of America are the New York Stock Exchange (NYSE) and NASDAQ* stock exchange. (STRINGHAM, Edward Peter, 2015)

Stocks and Exchange Commission is the agency that regulates the U.S. stock market. SEC is an independent of the Political party in power and its mission is to protect investors rights and maintain fair trade in the market. (RUTTERFORD, Janette. 1993)

3.3.1 Role of Stock Exchange

An Exchange allows companies to raise capital by providing them with access to private and institutional investors. Stock Exchange influences economy on a huge scale.

There are four forms of capital raising used by companies;

Going Public: Large companies after reaching certain point of growth tend to go Public for raising more money and developing company further to the next level. Sometimes Start-ups also go public to raise capital.

Limited Partnership: It means ownership of company belongs to more than one or two persons. In this each partner is entitled to share profit and loss, according to legal partnership agreement.

Venture Capital: It is financing that investors provide to start-up companies where they see huge potential in future. This capital comes from investment banks, Angel investors and any other financial institution. Start-up receive this kind of capital by showing their plan to these high net worth individuals. For Example, In India OYO room start-up received \$100,000 from one fellowship program run by Peter Thiel and now company is earning millions of dollars, all over the world.

Corporate partners: Under this program, well established multinational companies provide capital to small businesses in exchange of marketing rights, patent rights or equity. (GILSON, Ronald J. 1998)

3.3.2 How Stock Exchange effect economy:

Moving Savings toward investment: When people invest their saving in purchasing shares, it helps companies to promote business activities in several economic sectors such as agriculture, commerce industry, which leads to promote economic growth.

Corporate governance: When companies have wide range of owners, it tends to improve managerial standards and efficiency to satisfy these shareholders and more stringent rules are applied by stock exchange and government on these public companies.

Govt. Capital Raising: Sometimes government raise capital through stock exchange by selling certain kind of securities and bonds for some projects.

Economic condition: Stock exchange shows how economy of the country is behaving through indices like S&P 500 and many more. Stock market crash means economy is in recession, when share price are falling drastically and vice-versa. (PETTINGER, Tejvan. 2018)

3.3.3 Modern Stock Exchange

Today, virtually every country in the world has its own stock market. Stock markets typically emerged in the 19th and 20th century soon after the formation of LSE and NYSE. Major Economic powers all over the world have powerful stock markets. Major stock exchanges in the world according to market capitalization in 2017 were:

1. NYSE,
2. NASDAQ,
3. Japan Exchange group,
4. Shanghai Stock Exchange,
5. Euronext,
6. London Stock Exchange,
7. Hong Kong Stock Exchange,

8. Shenzhen Stock Exchange,
9. TMX Group (Canada),
10. National Stock Exchange of India (World Federation of Exchanges, 2016).

3.3.4 Stock Index

The stock Index is weighted average of few companies in the market. Market participants look at index to figure out the stocks of companies which are listed on the index. It is the smaller sample of the market. There are thousands of stock indexes all over the world, but we will try to have some knowledge about which are used most in the U.S. stock market. Every country has its own indexes on its stock exchanges. (ANDREW, Lo. 2016)

Major U.S stock indexes:

1. The Dow Jones Industrial Average: The DJIA covers 30 large-cap (1) blue chip companies, it includes companies like Apple, Coca-Cola, Microsoft and Visa. It covers all industries except transportation and utilities. It is not necessarily the best indicator of market performance because it has only 30 stocks out of 5000 stocks traded on NYSE and NASDAQ. But the stocks in this index are from Blue chip companies, so it is not risky. It is price weighted index, which means more expensive stocks influence the index more than the less expensive stocks. But still it is one of the most watched indexes in the world, from last 120 years.
2. The Standard and Poor's 500 Index: It was the first U.S. market-cap-weighted index. The S&P 500 includes 500 large-cap U.S. companies with eighty percent coverage of available market capitalization. It covers companies from all industries, e.g. Apple, Johnson & Johnson, ExxonMobil and many more. Only companies with big market capitalisation are listed here.
3. The Nasdaq Composite Index: It represents all the stocks traded on NASDAQ stock market. There are 3000 plus companies listed on Nasdaq, it contains companies mostly from technology and internet market, but there are companies from other

industries as well. It is market capitalisation-weighted index. Eligibility requirements for the index are reviewed throughout the year, a security that does not meet requirements can be removed, at its last sale price.

4. The Wilshire 5000 Total Market Index: It is market capitalisation-weighted index for the securities that are traded on American stock market. It contains companies that are Headquartered in U.S. On June 2018 the index contained 3,486 stocks.
5. The Russell 2000 Index: It is one of most used in fourteen FTSE Russell indexes. It is made up of the bottom 3000 stocks in the Russell 3000 index. Russell 2000 measures the performance of 2000 small-cap companies in the United States. Russell thousand is benchmark for mutual funds. Many mutual funds and ETFs are based on Russell 2000. All U.S. Russell indexes are subset of Russell 3000 (SCHICK, Kate. 2018)

Index Fund: Index fund is a type of Mutual Fund that tracks the performance of various indexes like S&P and DJIA. It provides broad market exposure and less risk in buying every single stock. Index fund is passive form of investing. This investment does not require a lot of time from investors as they don't have to spend time analysing stocks. Even Warren Buffet says that index fund is good investment for retirement. But that does not guarantee that you will never lose money. Index fund also follow Bearish and Bullish market. For 2017, investors poured more than \$692 billion into index funds. (FOLGER, Jean. 2018)

3.4 Stock Trading

Stock Trading means a transfer for money of a stock or security from a seller to the buyer. Once a company completes IPO, its shares become public and are ready to be traded on stock market. Some stock exchanges exist on physical locations where trading takes place on trading floor, but nowadays stock exchanges are virtual, which consists of network of computers where trades are made and recorded automatically. Two general types of securities are traded on stock market Over-the-counter (OTC) and listed securities. OTC securities are traded directly between parties, usually via the dealer and not listed on any

exchange, these types of securities are listed on the pink sheet. Pink sheet securities do not meet the requirements for being listed on exchanges. Bankrupt companies are listed there as penny stocks which means the value per share is \$5. Investing in pink sheet securities is like investing in the private company as they do not need to comply with SEC requirements.

Listed securities are officially registered securities on exchanges. If a company want to get listed on any exchange it must meet the requirements of that exchange and should pay entry fee and yearly listing fees. However, it is easier to be listed on NASDAQ than NYSE. (HAYES, Adam. 2016)

3.4.1 Types of Stock Market

The Stock Market is further divided into two parts.

- Primary Market
- Secondary Market

1. **Primary Market:** The primary market is where new issues are sold through initial public offerings (IPOs). Basically, it is the place where securities are created. The worth of the company going public and the number of shares being issued determine the opening stock price of IPO. It is the first chance for the investors to contribute in a capital of a company by purchasing its stocks. Here securities are only purchased directly from an issuer.
2. **Secondary market:** Stock market where exchanges are taking place is referred as secondary market. Securities are sold by one investor to another. Investor's trade previously issued securities with no involvement of companies. For example, if you go to buy Apple stocks, you are dealing with another investor who already owns shares in Apple. Apple is not involved with the transaction.

Secondary market can be further divided in to two parts:

- **Auction Market**
- **Dealer Market**

1. Auction market: In this market all individuals who wants to trade securities congregate in one area and announce there at which they are willing to buy and sell. It is referred to as bid and ask prices. NYSE is the best example of auction market.
2. Dealer Market: Here participants are joined through electronic networks, they do not need to be physically present at one place. The dealer holds an inventory of security, then stands to sell to market participants. Dealers earn profit between the spread of prices at which they buy and sell securities. NASDAQ is the example of dealer market, where they provide firm bid and ask price. Competition between dealers will provide best price to investors. (BEERS, Brian. 2018)

3.4.2 Who works in the Stock Market?

Stock market participants refer to many agents who buy and sell equity backed securities either directly or indirectly in a financial exchange. A participant can be an individual retail investor, institutional investors such as mutual funds, Banks, Insurance companies and publicly traded corporations, trading in their own shares. Participants are generally subdivided into three categories: Households, Institution and foreign traders (MITCHELL, Cory. 2018)

3.4.3 U.S. Stock Market

New York Stock Exchange: Nicknamed as “The Big Board” is an American Stock Exchange located at 11Wall Street, Lower Manhattan, New York City, New York. It is by far the world’s largest Stock Exchange by market capitalization of its listed companies at US\$21.3 trillion as of June 2017. The NYSE is owned by Intercontinental Exchange, an American holding company that it also lists. The main building located at 18 broad street, between the corners of the wall street and Exchange Place, was designated a National Historic Landmark in 1978, as was 11 wall street building. The NYSE opened from Monday

through Friday from 9:30 am – 4:00 pm ET, except for holidays declared by the Exchange in advance. The NYSE trades in continuous auction format, where traders can execute stock transactions on behalf of investors. The auction process moved toward automation in 1995 using wireless hand-held computer (HHC). As of 24th January 2007, all NYSE stocks can be traded via its electronic hybrid market. After this customers could send orders for immediate electronic execution, or route orders to the floor for trade in the auction market. In the first three months of 2007, 82% of all order volume was delivered to the floor electronically. Until 2005, the right to directly trade shares on Exchange was conferred upon owners of the 1366 seats. These seats were a sought-after commodity as they conferred the ability to directly trade stocks on NYSE, seat holders were commonly referred to as members of NYSE. The Barnes family is the only known lineage to have five generations of NYSE members. The most expensive inflation adjusted seat was sold in 1929 for \$625,000, which today is equal to six million dollars. Price of seats falls during the recession and rises during economic expansion. (FUHRMANN, Ryan. 2016)

NASDAQ: It is an American stock exchange holding the position of second largest exchange in the world. NASDAQ was founded in 1971 by the National Association of Securities Dealers. On 8th February 1971 it began trading and it was the first electronic stock market. Over the years, the NASDAQ Stock Market became more of a stock market by adding trade and volume reporting and automated trading systems. It was also the first stock market in the U.S which started trading online, highlighting NASDAQ traded companies and closing with the declaration that the NASDAQ Stock Market is the market for the next hundred years. The NASDAQ Stock Market attracted new growth companies such as Microsoft, Apple, Cisco and Dell and helped modernize the IPO. In 1992, the Nasdaq stock market joined with London Stock Exchange to form the first intercontinental linkage of the securities market.

In 2006, the status of NASDAQ Stock Market was changed from a stock market to a licensed national securities exchange. In 2007, NASDAQ merged with OMX, a leading exchange operator in Nordic countries, expanded its global footprint and changed its name to the NASDAQ OMX Group. (FUHRMANN, Ryan. 2016).

3.5 Stock Analysis:

Definition: It is the evaluation of a trading instrument, an investment sector or market. It is an attempt by an analyst to determine the future activity of a sector or market.

Fundamental Analysis: This works based on data collected from sources like company assets, economic recording, financial records and market share. Fundamental Analysis is a method of evaluating a stock to measure its intrinsic value. To conduct fundamental analysis investor or analyst must analyse the metrics on a company's financial statements like Balance Sheet, Income statement, Cash flow statement and footnotes. These statements are released to the public in the form of a 10-Q OR 10-K REPORT through the database system, EDGAR, which is administered by the US Securities and Exchange Commission. While doing analysis, the analyst will use ratios to determine the profitability, liquidity of a company. For example, Current ratio and Quick ratio. Fundamental analysis involves comparing a company's current financial statement with its previous year financial statement to give an investor a sense of whether the company is growing, stable or losing. It gives information about company's growth, is it strong enough to face competition in the future. (EARLY, James. 2016).

Technical Analysis: Technical Analysis is a method of evaluating securities value based on price trend not by intrinsic value of the security, it focuses on Price and Volume. Technical analysis focuses on the study of past market section to predict future price movement. Technical analyst analyzes the financial market and is primarily concerned with price and volume, as well as demand and supply factors that move the market. A chart is a key tool for the technical analyst as they show a graphical illustration of a stocks' trend with in a stated

time. This analysis is useful only when the price trend analysed is influenced by supply and demand forces. When outside factors are involved in price movement, then the technical analysis is not successful. Outside factors like a stock split, dividend announcement, terrorist attack, change in management, etc. (KUEPPER, Justin. 2017)

There are different forms of technical analysis which are based on chart patterns, technical indicators and oscillators. This analysis is based on three Principles:

1. The Market discounts Everything.
2. Price Moves in trends.
3. History tends to repeat itself.

Trends in Technical Analysis: Trends are not easy to see in technical analysis, as prices do not move in straight line. Direction of Highs and Lows tend to set trend in analysis. An uptrend means series of higher highs and Downtrend means series of lower lows. There are three types of trends:

Uptrend.

Downtrend.

Sideways/Horizontal

Trend can be classified according to length of the time. There are three types of trend lengths, Short-term, Intermediate-term, Long-term. Short term occurs over less than a month, Intermediate trend occurs over two to three months and long-term trend occurs over longer than one year.

Trendlines: It is a simple straight line drawn on chart of a stock to show the higher and upper points for the general trend direction.

Channels: It consists of two trend lines where upper line consists of series of highs, while lower trendline consists of series of lows. Lower line is called support and upper is called

resistance and traders expect the stock price to trade between the support and resistance trendlines.

Volume: It is the number of shares that trade over a given period. It is displayed as a bar chart directly below the price chart. Volume may increase or decrease over time and this reflects trend. For example, A stock jumps ten percent after being in long-term down trend but it does not mean that it is the uptrend of the stock, it depends on the amount of volume, if the volume is higher than the average then we can say that it is uptrend and if volume is below average than downtrend will continue. (KUEPPER, Justin. 2017)

Charts: These are graphical representations of a series of price over time. Chart can show stock price movement for one day to one year and even for just one hour with representations in seconds. On chart price is on the Y-axis and time is usually on the X-axis.

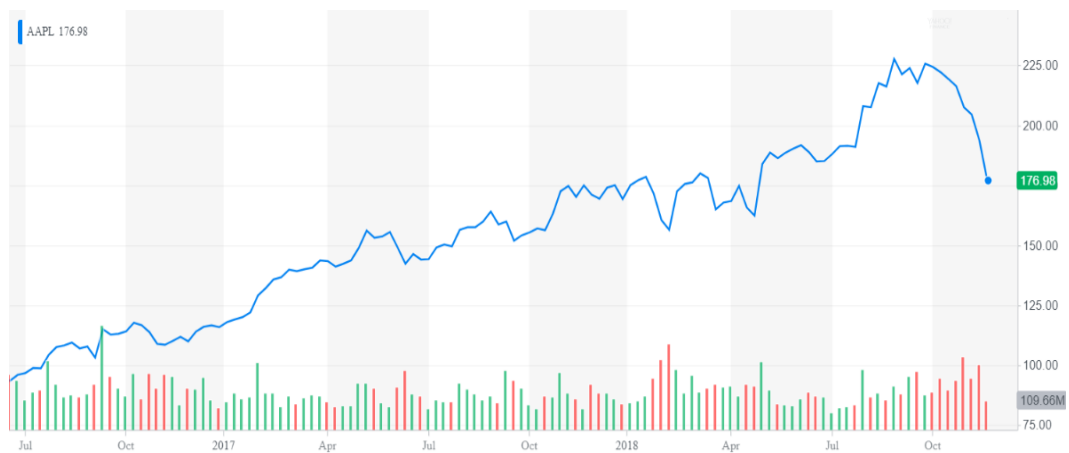
Properties:

1. Time scale: It refers to the range of dates which appear at the bottom of the chart and it can vary from seconds to decades. The most commonly used time scales are intraday, daily, weekly, monthly, quarterly, and yearly. Intraday chart shows price movement within the day and are often used by day traders. Daily charts represent price movement for the single day, showing closing price, open, high, low, close for the day according to chart types. Whereas, weekly, monthly and yearly charts are used to analyse long-term trends in stock prices.
2. Linear Price Scale: It has even spacing between each price point i.e. that a price moves from \$10 to \$20 is the same distance as a price that moves from \$50 to \$60.
3. Logarithmic Scale: This scale shows price movement in percentage terms i.e. the spacing between each point is equal to percentage change. It will show a bigger space between \$10 and \$20 move than between \$40 and \$50.

3.5.1.1.1 Types of Charts: There are four primary charts used by investors to read stocks.

- **Line Chart:** It is a simple form of chart as it represents only closing prices over a set period. Line connects all the closing prices over the timeframe. This type of chart is not useful for intraday trading. (KUEPPER, Justin. 2017)

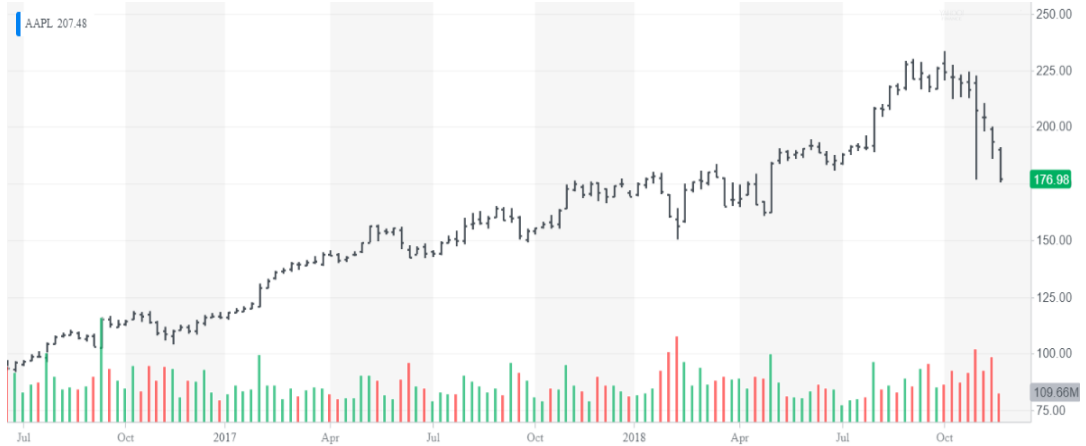
Figure 1 Line Chart



Source: Yahoo Finance 2017-18

- **Bar Chart:** It is an addition to line by adding high, low, open and close for the security. The chart is made up of series of vertical lines that represents the price range for a given period with a horizontal dash on each side that represents the open and closing price. The horizontal dash on the left side represents opening price and on the right side it represents closing price. When the opening price is lower than closing price, the line is shaded black to represent a rising period and if it's opposite then line is shaded red to represent falling period. (KUEPPER, Justin. 2017)

Figure 2 Bar Chart



Source: Yahoo Finance 2017-18

- **Candlestick Chart:** This is extremely popular among traders and investors. It was originated in Japan over 300 years ago, started by Japanese rice trader. Candlestick body represents open and closing price of the security while the wick or shadow on the top and bottom represents high and low. Falling periods have a red or black candlestick body, while rising period have a white or clear candlestick body. (KUEPPER, Justin. 2017)

Figure 3 Candlestick Chart



Source: Yahoo Finance 2017-18

Indicators: Technical analysis uses indicators based on mathematical calculation using price, volume, to measure current conditions as well as forecast financial trends.

There are two types of indicators:

1. Leading indicators: These indicators precede price movement and try to predict the future. They are helpful in non-trending price movement as they can help identify breakouts or breakdowns. For example, RSI and MACD.
2. Lagging indicators: They follow price movements and act as a confirmation tool. These are useful in trending periods and they can be used to confirm the trend whether it is still growing or weakening. For Example, SMA and EMA. (MURPHY, Casey. 2018)

Moving Averages: It is about reading the average of past price movements, to gauge the current price movement. There are three types of moving averages which are most popular, and these are Simple Moving Average, Exponential Moving average, and Linear weighted moving averages.

Simple Moving Average: It is simplest form of averages which takes sum of all the past closing prices over a time period and divide it by total number of prices taken in the calculation. For example, ten-day SMA will take closing price from last ten days and divides them by ten.

Exponential Moving Average: It uses complex calculation than SMA and puts a higher weight on more recent data points. EMA is more responsive to new information as compared to SMA.

$$EMA = (P * \alpha) + \{Previous EMA * (1 - \alpha)\} \quad (4)$$

P= Current price

α = Smoothing Factor = $2/1+N$

N= Number of time periods. (KUEPPER, Justin. 2017)

Indicators Used:

Moving Average Convergence-Divergence: It is one of the most used technical indicators. The MACD indicator uses two exponential moving averages, covering two different time periods. MACD is the difference between these two moving averages, that are 12-day EMA and 26-day EMA. It also uses 9-day EMA to form the signal line. There is also MACD histogram which represents the difference between MACD and signal line. In simple language MACD is all about convergence and divergence of the two moving averages. The MACD oscillates below and above zero line or we can say centre line. When 12-day EMA is above 26-day EMA it means MACD is positive i.e. upside momentum is increasing and vice-versa. (MURPHY, Casey. 2018)

Signal Line Crossover: When MACD crosses above the signal line it is bullish crossover and when MACD turns down and crosses below signal line it is bearish signal. It can last few days or weeks, depending on the strength of the move.

Centre Line Crossover: Under this when MACD line moves above zero line it is a bullish centreline crossover and it happens when 12-day EMA is above 26-day EMA and when MACD moves below zero line it is bearish crossover and in this 26-EMA is above 12-EMA. These crossovers can last few days or months.

Divergences: It is divergence between MACD and price of the security. This signal means that the momentum in the security is moving in the opposite direction of the true trend and suggests a future weakening in the trend. When MACD is moving in upward direction and price is moving down it is a bullish signal and when MACD is moving down and price is moving upwards it is a bearish signal.

- **Relative Strength Index:** RSI is used to capture overbought and oversold conditions in the security. It is plotted between zero to hundred where zero is the highest oversold condition and hundred is the highest overbought condition. Generally oversold is when RSI falls below 20 and overbought is when RSI moved above 80.

Divergence: When security makes a lower low, but RSI forms a higher low it is seen as bullish divergence and bearish divergence occurs when the security shows higher high and RSI forms a lower high. Divergence can be misleading in a strong trend. (MURPHY, Casey. 2018)

- **Stochastic Oscillator:** It is another momentum indicator used in technical analysis and it helps in showing when bulls or bears are becoming strong or weak in the market. It is plotted within a range of zero and hundred, where above 80 is considered as overbought and below 20 is considered as oversold. It is not necessary that it will be bearish signal during overbought because it depends on the strength of the trend and similarly oversold readings are not always bearish. It is important to look deeply in to the trend.

Divergences: When Stochastic does not confirm high or low in price of the security it is seen as divergence. When price records a lower low, but oscillator records a higher low it is said to be bullish divergence and when price records higher high but stochastic forms a lower high it is seen as bearish signal. Support break can confirm bearish divergence and resistance break can confirm bullish divergence. The break is usually 50 and it is also called centreline because it is the centre between 0 and 100. (MURPHY, Casey. 2018)

4 Practical Part

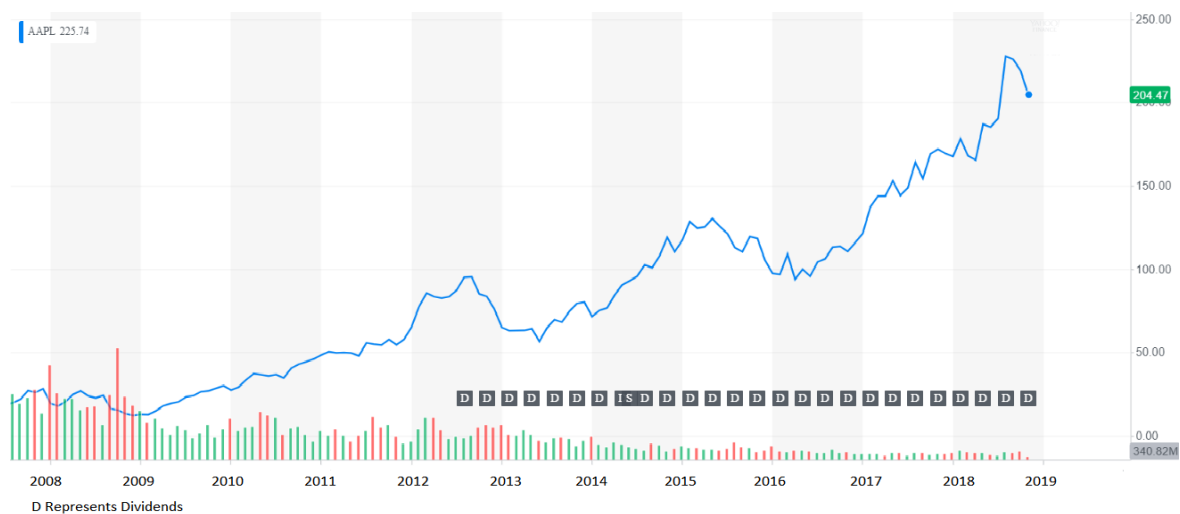
Apple

Apple is an American Technology company Headquartered in Cupertino, California. The company makes hardware and software where hardware includes products like iPhone, iPad, Mac PC, iPod, Home Pod, Apple TV and Apple watch, whereas on software side they have macOS, iOS, iTunes, Safari and many more. It was founded in 1976 by Steve jobs, Steve Wozniak and Ronald Wayne. The first computer they built was Apple 1 and with the success of Apple 2 it went public in 1980. It is the world's third largest mobile manufacturer after Samsung and Huawei with a market value of 1 trillion USD. (BLOOMBERG)

Technical Analysis of Apple:

Figure 4 shows Apple stock chart from 2008 till 2018. The Blue line represents stock price between 2008 and 2018, and green and red bars represents volume of stocks traded in billions. In this figure we can see that average stock price is going higher, so the volume traded is decreasing due to higher stock price, but it does not mean that it is downtrend.

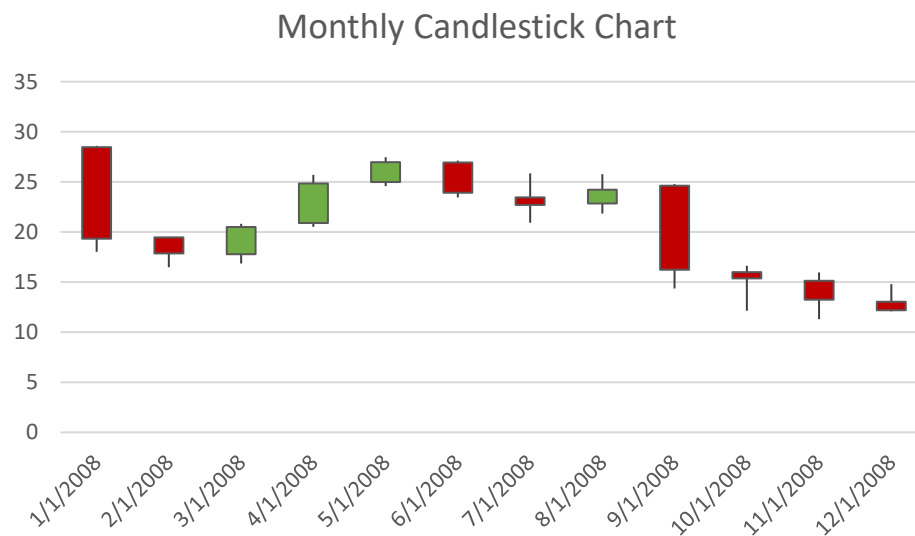
Figure 4 AAPL Stock From 2008-18



Source: Yahoo Finance 2008-18

2008 Market Crash: As we all know Stock market crash of 2008, led to shut down of many big firms like Lehman Brothers collapsed. Let's throw some light on Apple stocks in 2008.

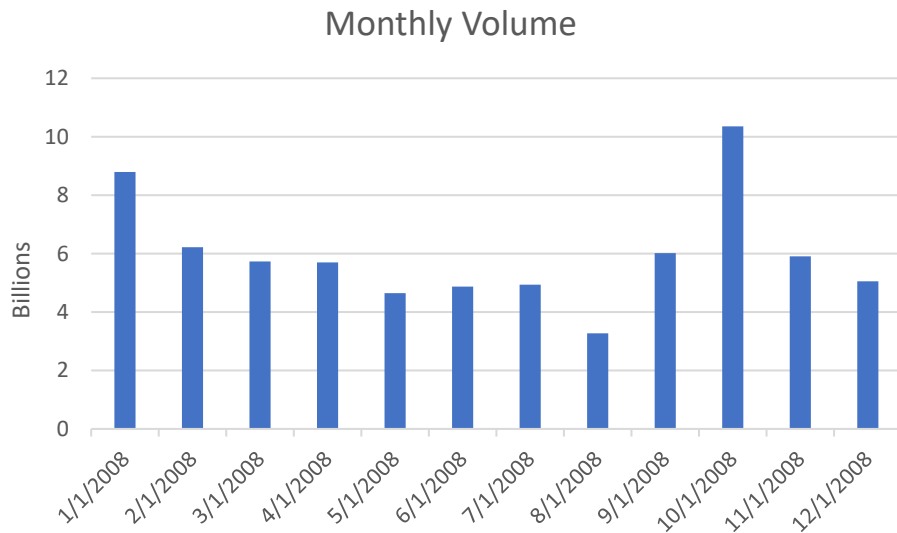
Figure 5 AAPL 2008 monthly candlestick chart (Based on data collected from yahoo finance)



Source: Yahoo Finance 2008

Figure 5 represents Monthly candlestick chart for 2008 stock price of Apple. The red candle body says that opening price was higher than closing price and wicks represents highest high and lowest low price, whereas green candle has closing price higher than opening price. We can also say red candle is Bearish Candle and Green Candle as Bullish Candle.

Figure 6 AAPL monthly volume traded in 2008 (Based on data collected from yahoo finance)



Source: Yahoo Finance 2008

Figure 6 shows the volume of shares traded monthly in 2008. As volume is higher in the beginning and little decreasing till crash in September, but after September the volume of shares almost doubled in October, due to enormous decrease in stock price more stocks were bought after crash.

Figure 7 Comparison of major Indices with AAPL

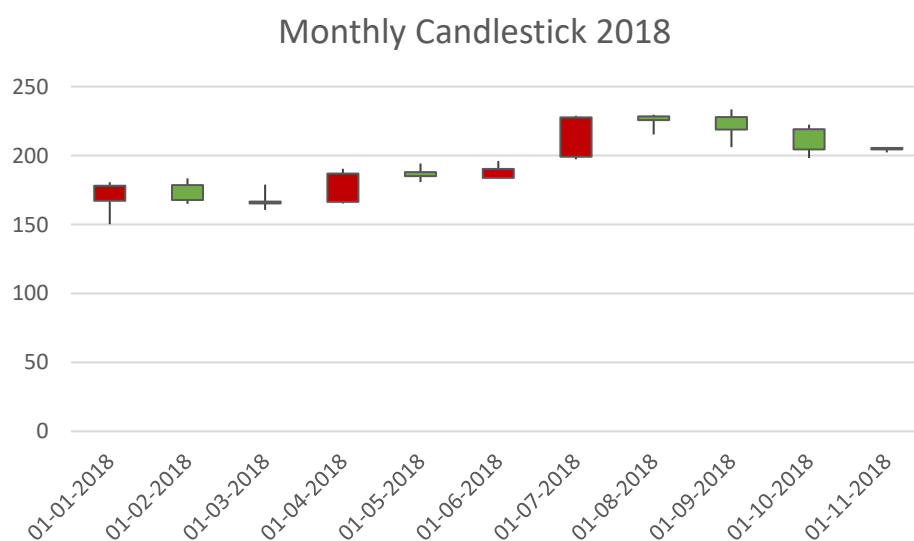


Source: Yahoo Finance 2008

In figure 7 Apple stock is compared with major indexes of the stock market during 2008. The graph shows that from the beginning market is performing higher than Apple stock and between May and June the apple stock went more higher as compared to trend in whole market, till August it stays higher but close to market crash the value of stock fell hugely as it can be seen from September, the stock remained on a very low price till the end of the year. Due to fall in price of the stock, the volume went higher. So, from this we can say that sometimes stock may not follow the market, but it cannot last for long period.

4.1 Analysing Apple in 2018

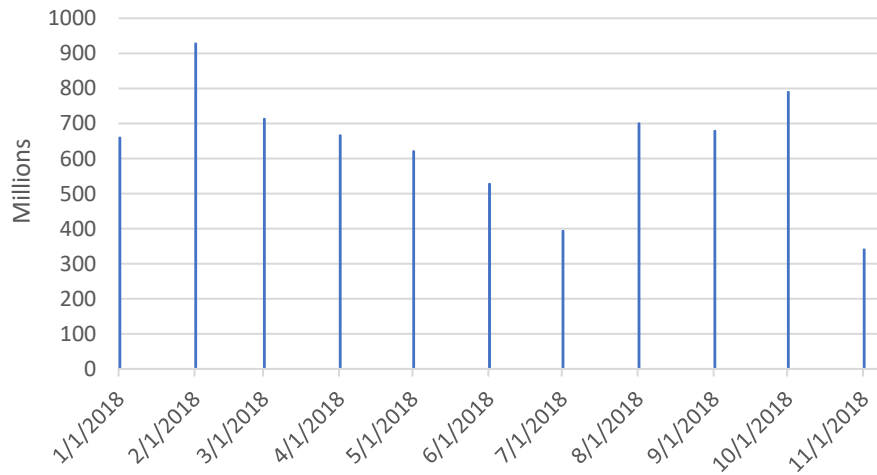
Figure 8 Monthly Candlestick 2018



Source: Yahoo Finance 2018

Figure 8 shows monthly movement of price in 2018 with candlestick chart. The stock price is going higher day by day.

Figure 9 AAPL Volume Traded in 2018



Source: Yahoo Finance 2018

Figure 9 shows the volume of Apple stocks traded monthly in 2018.

4.1.1 Moving Averages

4.1.1.1 Exponential Moving Average and Simple Moving Average

Figure 10 EMA and SMA



Source: Yahoo Finance 2018

Figure 12 shows Simple and Exponential Moving averages together and EMA is little more reliable than SMA. EMA 50-day is showing more downtrend after October than SMA. From figure 12 we can see that trend is not so strong enough to say if it is up or down. Shorter term moving averages are above long term and they are diverging till November, so it is an upward momentum. Moving averages can also be used to put stop-loss order, to prevent further loss on the security. So, from this data we can put stop-loss at \$175 to prevent further loss. Price crossover and MA crossovers can be used to see buy and sell signal. When security closes above MA it is beginning of uptrend which can be seen at many places on chart and when security closes below MA it is a downtrend. So, from November downtrend is started.

4.1.2 Technical Indicators

4.1.2.1 Relative strength Index:

Figure 11 RSI



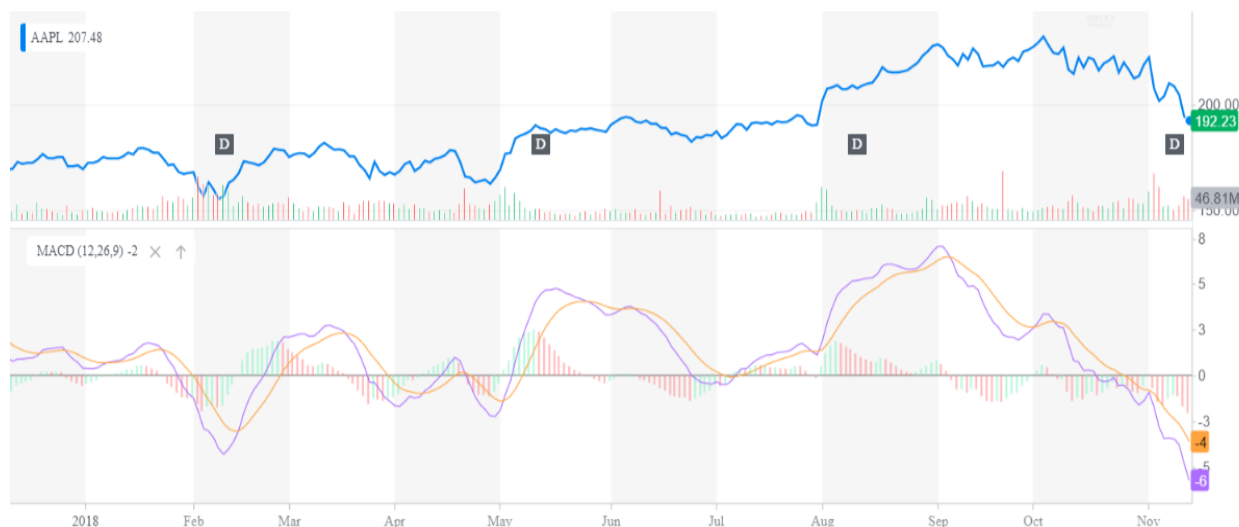
Chart above shows RSI for the year 2018. Upper half represents stock price of Apple.
Source: Yahoo Finance

Source: Yahoo Finance 2018

RSI indicator identifies the stock when it is overbought or oversold. In figure 13, when RSI reaches above 80 it is overbought condition and when it falls below 20 it is oversold. Under 30 it is a bullish indicator and above 70 it is bearish indicator. As shown in chart, from May till June RSI was frequently hitting above 70 which means it was an uptrend, same between August and September but after September RSI is above 30 but cannot reach 70, so it is weakening of the trend. Chart 13 shows bullish divergence between February and May, where stock moved low, but RSI was above its prior low and as we can see after May the stock price went higher towards bullish trend and from October the stock was highest in prior values, but RSI formed lower highs as to previous values, so it was a bearish divergence.

4.1.2.2 Moving-Average-Convergence-Divergence

Figure 12 MACD



Upper Half represents stock price and lower half represents MACD.
 The Purple line is MACD, Golden is smoothing line, red and green are decreasing and increasing bars.
 Source: Yahoo finance

Source: Yahoo Finance 2018

Figure 14 shows MACD for the year 2018 with the base line. If we look at MACD and Signal line just before February, we can see that MACD fell below signal line which is a bearish signal and later it rises above MACD and this is bullish signal. This bullish and bearish signal

can also be seen with the help of histogram. So, after October bearish trend started and continues going low. Centreline Crossovers are also the important signals in MACD. There are seven crossovers within a year in the above chart. As we can see close to February it was a bearish crossover and till the end of the month trend was bearish but later bullish crossover happened near March. The Stock price was in uptrend from August till mid of October and then downtrend started confirmed with bearish crossover. So, the trend was not so strong during 2018.

4.1.2.3 Stochastic Oscillator

Figure 13 Stochastic Oscillator



The Graph above shows Stochastic oscillator with black and red lines called K line and D line. The upper part of the graph shows stock price movement of Apple.
Source: Yahoo finance

Source: Yahoo Finance 2018

Figure 15 represents Stochastic Oscillator with price chart of Apple stock. When indicator went above 80, the stock was overbought, and individual should sell and when it went under 20 it is oversold so when one should buy at that time. As we can see that in the middle of September and October it was buying time and same between October and November but in the beginning of October it was selling time. Till November, stock is not overbought but oversold at points and continues to fall so this could be the signal to buy stock for future

gains. In chart we can see in bearish divergence in September when stock went higher high, but the stochastic marked lower highs and it was the signal when oscillator went below 20 and stock was stable but later stock broke support and fell hugely.

5 Results and Discussion

The purpose of this thesis is to have general understanding of Stock market. In the theoretical part we learned about market history, what are stocks, types of stocks with reference to based on their ownership and based on price trends then next thing we learned about stock exchange, role of stock exchange and how exchange effects economy of the country. Then we learned about topics such as Stock index, Index fund, Types of Stock market, U.S.A. stock market, Stock trading and in final part of theory we learned about Stock analysis using Fundamental and Technical analysis. We focused more on technical analysis with learning more about stock charts, technical indicators and moving averages.

The practical part is focused on the analysis of the company Apple, where in the beginning we have general description of Apple and later we moved on to analyse the performance of the Apple. First, we discussed about 2008 market crash effect on the AAPL stocks and how it affected the volume traded during market crash and price behaved during crash of the market. In next part we tried to analyse Apple stocks using SMA, EMA, RSI, MACD and Stochastic Oscillator and after using these indicators, we came to know that trend was not so strong in the year 2018. In the beginning the stock was in downtrend but after February it went little up but in April and May it was bearish market and after May stock picked up till the beginning of the November and then started falling again. So, after learning about technical analysis and indicators we conclude that November could be a good opportunity to buy Apple stocks as price is close to lowest as seen form the prior prices of the 2018.

6 Conclusion

The aim of this thesis to learn basics of stock market especially U.S. market. In theoretical part we focused on general terms of the stock market like Stock index, Stock Exchange Types of stocks, Stock trading and Stock analysis. Theory also explains history of the stock market, types of stock market and how stock exchange can make impact on the economy of the country. Under Stock analysis we described Fundamental and Technical, but more focus is on Technical analysis and tools like SMA, EMA, RSI, MACD and Stochastic Oscillator are explained in detail. After reading this thesis one should have general understanding of the Stock market and various terms used in the market. Practical part covers 2008 market crash effect on Apple stock with illustrated chart and how price and volume were affected by the crash and AAPL is compared with major stock indices and later we studied 2018 market which gives us idea about how Stocks behave and how technical indicators can be used to have better return in the future. We used Moving averages to know about the strength of the trend, which can help in making an investment decision. Every Indicator used gave us unique result about stock, for example RSI confirmed, when stock is overbought and oversold whereas MACD gives information about Bullish and Bearish trend in the market. Technical indicators gave us idea about the performance of the stock, strength of the trends. So, as we know technical analysis is based on some factors like history tends to repeat itself and after using indicators, we see that price of the stock in November is falling and it may not create new lower low as to previous prices, so it could be better point to invest in Apple. Although it is never hundred percent but after using indicators for the year 2018 on AAPL, it is not wrong to say that stock is not in the strong trend and price is falling to the lowest of the last few months. It could be a right decision to buy at this time as price is low and it may not fall further as seen from last few months.

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8 Appendix

Table 1. RSI calculations (2018):

Date	Closing Price		Gain	Loss	Avg. Gain	Avg. Loss	RS	RSI
02-01-2018	172.26							
03-01-2018	172.23	-0.03	0.00	0.03				
04-01-2018	173.03	0.80	0.80	0.00				
05-01-2018	175.00	1.97	1.97	0.00				
08-01-2018	174.35	-0.65	0.00	0.65				
09-01-2018	174.33	-0.02	0.00	0.02				
10-01-2018	174.29	-0.04	0.00	0.04				
11-01-2018	175.28	0.99	0.99	0.00				
12-01-2018	177.09	1.81	1.81	0.00				
16-01-2018	176.19	-0.90	0.00	0.90				
17-01-2018	179.10	2.91	2.91	0.00				
18-01-2018	179.26	0.16	0.16	0.00				
19-01-2018	178.46	-0.80	0.00	0.80				
22-01-2018	177.00	-1.46	0.00	1.46				
23-01-2018	177.04	0.04	0.04	0.00	0.62	0.28	2.23	69.00
24-01-2018	174.22	-2.82	0.00	2.82	0.58	2.88	0.20	16.67
25-01-2018	171.11	-3.11	0.00	3.11	0.53	5.56	0.10	8.77
26-01-2018	171.51	0.40	0.40	0.00	0.87	5.16	0.17	14.39
29-01-2018	167.96	-3.55	0.00	3.55	0.81	8.09	0.10	9.06
30-01-2018	166.97	-0.99	0.00	0.99	0.75	8.43	0.09	8.15

31-01-2018	167.43	0.46	0.46	0.00	1.12	7.83	0.14	12.53
01-02-2018	167.78	0.35	0.35	0.00	1.37	7.27	0.19	15.83
02-02-2018	160.50	-7.28	0.00	7.28	1.27	13.51	0.09	8.59
05-02-2018	156.49	-4.01	0.00	4.01	1.18	16.27	0.07	6.75
06-02-2018	163.03	6.54	6.54	0.00	7.17	15.11	0.47	32.18
07-02-2018	159.54	-3.49	0.00	3.49	6.66	17.27	0.39	27.82
08-02-2018	155.15	-4.39	0.00	4.39	6.18	20.11	0.31	23.51
09-02-2018	156.41	1.26	1.26	0.00	6.91	18.68	0.37	27.00
12-02-2018	162.71	6.30	6.30	0.00	12.27	17.34	0.71	41.43
13-02-2018	164.34	1.63	1.63	0.00	12.90	16.10	0.80	44.48
14-02-2018	167.37	3.03	3.03	0.00	14.79	14.95	0.99	49.73
15-02-2018	172.99	5.62	5.62	0.00	18.96	13.88	1.37	57.72
16-02-2018	172.43	-0.56	0.00	0.56	17.60	13.41	1.31	56.75
20-02-2018	171.85	-0.58	0.00	0.58	16.34	12.99	1.26	55.71
21-02-2018	171.07	-0.78	0.00	0.78	15.18	12.79	1.19	54.27
22-02-2018	172.50	1.43	1.43	0.00	15.42	11.88	1.30	56.49
23-02-2018	175.50	3.00	3.00	0.00	17.11	11.03	1.55	60.80
26-02-2018	178.97	3.47	3.47	0.00	19.11	10.24	1.87	65.11
27-02-2018	178.39	-0.58	0.00	0.58	17.74	10.05	1.77	63.84
28-02-2018	178.12	-0.27	0.00	0.27	16.47	9.58	1.72	63.23
01-03-2018	175.00	-3.12	0.00	3.12	15.30	11.79	1.30	56.47
02-03-2018	176.21	1.21	1.21	0.00	15.33	10.95	1.40	58.33
05-03-2018	176.82	0.61	0.61	0.00	14.80	10.17	1.46	59.27
06-03-2018	176.67	-0.15	0.00	0.15	13.74	9.58	1.43	58.92

07-03-2018	175.03	-1.64	0.00	1.64	12.76	10.42	1.22	55.05
08-03-2018	176.94	1.91	1.91	0.00	13.62	9.68	1.41	58.47
09-03-2018	179.98	3.04	3.04	0.00	15.47	8.98	1.72	63.26
12-03-2018	181.72	1.74	1.74	0.00	15.98	8.34	1.92	65.70
13-03-2018	179.97	-1.75	0.00	1.75	14.84	9.37	1.58	61.29
14-03-2018	178.44	-1.53	0.00	1.53	13.78	10.12	1.36	57.65
15-03-2018	178.65	0.21	0.21	0.00	12.99	9.40	1.38	58.02
16-03-2018	178.02	-0.63	0.00	0.63	12.06	9.31	1.30	56.43
19-03-2018	175.30	-2.72	0.00	2.72	11.20	11.17	1.00	50.06
20-03-2018	175.24	-0.06	0.00	0.06	10.40	10.43	1.00	49.93
21-03-2018	171.27	-3.97	0.00	3.97	9.66	13.37	0.72	41.94
22-03-2018	168.85	-2.42	0.00	2.42	8.97	14.66	0.61	37.95
23-03-2018	164.94	-3.91	0.00	3.91	8.33	17.25	0.48	32.56
26-03-2018	172.77	7.83	7.83	0.00	15.00	16.02	0.94	48.37
27-03-2018	168.34	-4.43	0.00	4.43	13.93	18.99	0.73	42.32
28-03-2018	166.48	-1.86	0.00	1.86	12.94	19.36	0.67	40.06
29-03-2018	167.78	1.30	1.30	0.00	13.22	17.97	0.74	42.38
02-04-2018	166.68	-1.10	0.00	1.10	12.28	17.71	0.69	40.94
03-04-2018	168.39	1.71	1.71	0.00	12.99	16.45	0.79	44.12
04-04-2018	171.61	3.22	3.22	0.00	15.05	15.27	0.99	49.63
05-04-2018	172.80	1.19	1.19	0.00	15.08	14.18	1.06	51.54
06-04-2018	168.38	-4.42	0.00	4.42	14.00	17.27	0.81	44.77
09-04-2018	170.05	1.67	1.67	0.00	14.55	16.04	0.91	47.57
10-04-2018	173.25	3.20	3.20	0.00	16.48	14.89	1.11	52.54
11-04-2018	172.44	-0.81	0.00	0.81	15.31	14.58	1.05	51.21

12-04-2018	174.14	1.70	1.70	0.00	15.79	13.54	1.17	53.84
13-04-2018	174.73	0.59	0.59	0.00	15.21	12.57	1.21	54.75
16-04-2018	175.82	1.09	1.09	0.00	15.14	11.67	1.30	56.46
17-04-2018	178.24	2.42	2.42	0.00	16.30	10.84	1.50	60.06
18-04-2018	177.84	-0.40	0.00	0.40	15.14	10.44	1.45	59.19
19-04-2018	172.80	-5.04	0.00	5.04	14.06	14.37	0.98	49.45
20-04-2018	165.72	-7.08	0.00	7.08	13.05	19.92	0.66	39.59
23-04-2018	165.24	-0.48	0.00	0.48	12.12	18.94	0.64	39.02
24-04-2018	162.94	-2.30	0.00	2.30	11.26	19.73	0.57	36.33
25-04-2018	163.65	0.71	0.71	0.00	11.11	18.32	0.61	37.76
26-04-2018	164.22	0.57	0.57	0.00	10.85	17.01	0.64	38.94
27-04-2018	162.32	-1.90	0.00	1.90	10.07	17.56	0.57	36.45
30-04-2018	165.26	2.94	2.94	0.00	12.08	16.30	0.74	42.56
01-05-2018	169.10	3.84	3.84	0.00	14.79	15.14	0.98	49.41
02-05-2018	176.57	7.47	7.47	0.00	20.67	14.06	1.47	59.52
03-05-2018	176.89	0.32	0.32	0.00	19.49	13.05	1.49	59.88
04-05-2018	183.83	6.94	6.94	0.00	24.54	12.12	2.02	66.94
07-05-2018	185.16	1.33	1.33	0.00	24.02	11.26	2.13	68.09
08-05-2018	186.05	0.89	0.89	0.00	23.13	10.45	2.21	68.88
09-05-2018	187.36	1.31	1.31	0.00	22.70	9.70	2.34	70.05
10-05-2018	190.04	2.68	2.68	0.00	23.56	9.01	2.61	72.34
11-05-2018	188.59	-1.45	0.00	1.45	21.88	9.71	2.25	69.25
14-05-2018	188.15	-0.44	0.00	0.44	20.32	9.43	2.15	68.30
15-05-2018	186.44	-1.71	0.00	1.71	18.87	10.34	1.82	64.59
16-05-2018	188.18	1.74	1.74	0.00	19.13	9.60	1.99	66.58

17-05-2018	186.99	-1.19	0.00	1.19	17.77	10.02	1.77	63.93
18-05-2018	186.31	-0.68	0.00	0.68	16.50	9.94	1.66	62.41
21-05-2018	187.63	1.32	1.32	0.00	16.55	9.23	1.79	64.19
22-05-2018	187.16	-0.47	0.00	0.47	15.36	9.01	1.71	63.04
23-05-2018	188.36	1.20	1.20	0.00	15.38	8.36	1.84	64.78
24-05-2018	188.15	-0.21	0.00	0.21	14.28	7.96	1.79	64.21
25-05-2018	188.58	0.43	0.43	0.00	13.66	7.39	1.85	64.89
29-05-2018	187.90	-0.68	0.00	0.68	12.69	7.50	1.69	62.86
30-05-2018	187.50	-0.40	0.00	0.40	11.78	7.33	1.61	61.64
31-05-2018	186.87	-0.63	0.00	0.63	10.94	7.39	1.48	59.67
01-06-2018	190.24	3.37	3.37	0.00	13.29	6.86	1.94	65.93
04-06-2018	191.83	1.59	1.59	0.00	13.81	6.37	2.17	68.42
05-06-2018	193.31	1.48	1.48	0.00	14.20	5.92	2.40	70.58
06-06-2018	193.98	0.67	0.67	0.00	13.81	5.50	2.51	71.53
07-06-2018	193.46	-0.52	0.00	0.52	12.82	5.59	2.30	69.65
08-06-2018	191.70	-1.76	0.00	1.76	11.91	6.82	1.75	63.57
11-06-2018	191.23	-0.47	0.00	0.47	11.06	6.77	1.63	62.02
12-06-2018	192.28	1.05	1.05	0.00	11.24	6.29	1.79	64.13
13-06-2018	190.70	-1.58	0.00	1.58	10.44	7.31	1.43	58.83
14-06-2018	190.80	0.10	0.10	0.00	9.79	6.78	1.44	59.06
15-06-2018	188.84	-1.96	0.00	1.96	9.09	8.12	1.12	52.81
18-06-2018	188.74	-0.10	0.00	0.10	8.44	7.63	1.11	52.51
19-06-2018	185.69	-3.05	0.00	3.05	7.83	9.92	0.79	44.13
20-06-2018	186.50	0.81	0.81	0.00	8.03	9.21	0.87	46.57
21-06-2018	185.46	-1.04	0.00	1.04	7.45	9.52	0.78	43.92

22-06-2018	184.92	-0.54	0.00	0.54	6.92	9.34	0.74	42.56
25-06-2018	182.17	-2.75	0.00	2.75	6.43	11.23	0.57	36.41
26-06-2018	184.43	2.26	2.26	0.00	8.07	10.42	0.77	43.62
27-06-2018	184.16	-0.27	0.00	0.27	7.49	9.93	0.75	43.00
28-06-2018	185.50	1.34	1.34	0.00	8.20	9.22	0.89	47.07
29-06-2018	185.11	-0.39	0.00	0.39	7.61	8.92	0.85	46.04
02-07-2018	187.18	2.07	2.07	0.00	8.99	8.29	1.09	52.04
03-07-2018	183.92	-3.26	0.00	3.26	8.35	10.72	0.78	43.78
05-07-2018	185.40	1.48	1.48	0.00	9.13	9.96	0.92	47.83
06-07-2018	187.97	2.57	2.57	0.00	10.86	9.25	1.17	54.02
09-07-2018	190.58	2.61	2.61	0.00	12.51	8.58	1.46	59.30
10-07-2018	190.35	-0.23	0.00	0.23	11.62	8.19	1.42	58.66
11-07-2018	187.88	-2.47	0.00	2.47	10.79	9.89	1.09	52.16
12-07-2018	191.03	3.15	3.15	0.00	12.94	9.19	1.41	58.48
13-07-2018	191.33	0.30	0.30	0.00	12.30	8.53	1.44	59.04
16-07-2018	190.91	-0.42	0.00	0.42	11.42	8.31	1.37	57.87
17-07-2018	191.45	0.54	0.54	0.00	11.10	7.72	1.44	58.99
18-07-2018	190.40	-1.05	0.00	1.05	10.31	8.14	1.27	55.88
19-07-2018	191.88	1.48	1.48	0.00	10.95	7.56	1.45	59.15
20-07-2018	191.44	-0.44	0.00	0.44	10.17	7.43	1.37	57.78
23-07-2018	191.61	0.17	0.17	0.00	9.60	6.90	1.39	58.18
24-07-2018	193.00	1.39	1.39	0.00	10.20	6.41	1.59	61.43
25-07-2018	194.82	1.82	1.82	0.00	11.16	5.95	1.88	65.24
26-07-2018	194.21	-0.61	0.00	0.61	10.37	6.09	1.70	63.00
27-07-2018	190.98	-3.23	0.00	3.23	9.63	8.65	1.11	52.66

30-07-2018	189.91	-1.07	0.00	1.07	8.94	9.03	0.99	49.75
31-07-2018	190.29	0.38	0.38	0.00	8.65	8.38	1.03	50.79
01-08-2018	201.50	11.21	11.21	0.00	18.44	7.79	2.37	70.32
02-08-2018	207.39	5.89	5.89	0.00	22.60	7.23	3.13	75.76
03-08-2018	207.99	0.60	0.60	0.00	21.54	6.71	3.21	76.24
06-08-2018	209.07	1.08	1.08	0.00	21.00	6.23	3.37	77.11
07-08-2018	207.11	-1.96	0.00	1.96	19.50	7.61	2.56	71.94
08-08-2018	207.25	0.14	0.14	0.00	18.24	7.06	2.58	72.08
09-08-2018	208.88	1.63	1.63	0.00	18.45	6.56	2.81	73.77
10-08-2018	207.53	-1.35	0.00	1.35	17.13	7.35	2.33	69.99
13-08-2018	208.87	1.34	1.34	0.00	17.15	6.82	2.51	71.55
14-08-2018	209.75	0.88	0.88	0.00	16.75	6.33	2.64	72.56
15-08-2018	210.24	0.49	0.49	0.00	16.00	5.88	2.72	73.13
16-08-2018	213.32	3.08	3.08	0.00	17.72	5.46	3.25	76.44
17-08-2018	217.58	4.26	4.26	0.00	20.41	5.07	4.03	80.10
20-08-2018	215.46	-2.12	0.00	2.12	18.95	6.68	2.84	73.95
21-08-2018	215.04	-0.42	0.00	0.42	17.60	6.59	2.67	72.76
22-08-2018	215.05	0.01	0.01	0.00	16.35	6.12	2.67	72.77
23-08-2018	215.49	0.44	0.44	0.00	15.59	5.68	2.74	73.29
24-08-2018	216.16	0.67	0.67	0.00	15.10	5.28	2.86	74.11
27-08-2018	217.94	1.78	1.78	0.00	15.67	4.90	3.20	76.19
28-08-2018	219.70	1.76	1.76	0.00	16.19	4.55	3.56	78.06
29-08-2018	222.98	3.28	3.28	0.00	18.08	4.22	4.28	81.06
30-08-2018	225.03	2.05	2.05	0.00	18.69	3.92	4.76	82.65
31-08-2018	227.63	2.60	2.60	0.00	19.77	3.64	5.43	84.44

04-09-2018	228.36	0.73	0.73	0.00	19.04	3.38	5.6 3	84.9 1
05-09-2018	226.87	-1.49	0.00	1.49	17.68	4.52	3.9 1	79.6 2
06-09-2018	223.10	-3.77	0.00	3.77	16.41	7.70	2.1 3	68.0 6
07-09-2018	221.30	-1.80	0.00	1.80	15.24	8.82	1.7 3	63.3 3
10-09-2018	218.33	-2.97	0.00	2.97	14.15	10.95	1.2 9	56.3 8
11-09-2018	223.85	5.52	5.52	0.00	18.27	10.17	1.8 0	64.2 4
12-09-2018	221.07	-2.78	0.00	2.78	16.96	12.02	1.4 1	58.5 2
13-09-2018	226.41	5.34	5.34	0.00	20.71	11.16	1.8 5	64.9 7
14-09-2018	223.84	-2.57	0.00	2.57	19.23	12.75	1.5 1	60.1 2
17-09-2018	217.88	-5.96	0.00	5.96	17.86	17.38	1.0 3	50.6 8
18-09-2018	218.24	0.36	0.36	0.00	16.92	16.14	1.0 5	51.1 8
19-09-2018	218.37	0.13	0.13	0.00	15.83	14.98	1.0 6	51.3 7
20-09-2018	220.03	1.66	1.66	0.00	16.24	13.91	1.1 7	53.8 6
21-09-2018	217.66	-2.37	0.00	2.37	15.08	15.12	1.0 0	49.9 3
24-09-2018	220.79	3.13	3.13	0.00	16.91	14.04	1.2 0	54.6 3
25-09-2018	222.19	1.40	1.40	0.00	17.00	13.04	1.3 0	56.6 0
26-09-2018	220.42	-1.77	0.00	1.77	15.79	13.75	1.1 5	53.4 5
27-09-2018	224.95	4.53	4.53	0.00	18.87	12.77	1.4 8	59.6 4
28-09-2018	225.74	0.79	0.79	0.00	18.25	11.86	1.5 4	60.6 2
01-10-2018	227.26	1.52	1.52	0.00	18.36	11.01	1.6 7	62.5 1
02-10-2018	229.28	2.02	2.02	0.00	18.92	10.22	1.8 5	64.9 3
03-10-2018	232.07	2.79	2.79	0.00	20.16	9.49	2.1 2	67.9 9
04-10-2018	227.99	-4.08	0.00	4.08	18.72	12.60	1.4 9	59.7 7
05-10-2018	224.29	-3.70	0.00	3.70	17.38	15.14	1.1 5	53.4 5
08-10-2018	223.77	-0.52	0.00	0.52	16.14	14.54	1.1 1	52.6 1

09-10-2018	226.87	3.10	3.10	0.00	17.87	13.50	1.32	56.96
10-10-2018	216.36	-10.51	0.00	10.51	16.59	22.30	0.74	42.67
11-10-2018	214.45	-1.91	0.00	1.91	15.41	22.48	0.69	40.67
12-10-2018	222.11	7.66	7.66	0.00	21.42	20.87	1.03	50.65
15-10-2018	217.36	-4.75	0.00	4.75	19.89	23.79	0.84	45.53
16-10-2018	222.15	4.79	4.79	0.00	22.92	22.09	1.04	50.92
17-10-2018	221.19	-0.96	0.00	0.96	21.28	21.41	0.99	49.85
18-10-2018	216.02	-5.17	0.00	5.17	19.76	24.68	0.80	44.47
19-10-2018	219.31	3.29	3.29	0.00	21.40	22.91	0.93	48.29
22-10-2018	220.65	1.34	1.34	0.00	21.12	21.28	0.99	49.81
23-10-2018	222.73	2.08	2.08	0.00	21.54	19.76	1.09	52.16
24-10-2018	215.09	-7.64	0.00	7.64	20.00	25.44	0.79	44.02
25-10-2018	219.80	4.71	4.71	0.00	22.95	23.62	0.97	49.27
26-10-2018	216.30	-3.50	0.00	3.50	21.31	25.19	0.85	45.83
29-10-2018	212.24	-4.06	0.00	4.06	19.79	27.16	0.73	42.15
30-10-2018	213.30	1.06	1.06	0.00	19.36	25.22	0.77	43.43
31-10-2018	218.86	5.56	5.56	0.00	23.14	23.42	0.99	49.70
01-11-2018	222.22	3.36	3.36	0.00	24.61	21.74	1.13	53.09
02-11-2018	207.48	-14.74	0.00	14.74	22.85	33.88	0.67	40.28
05-11-2018	201.59	-5.89	0.00	5.89	21.22	36.93	0.57	36.49
06-11-2018	203.77	2.18	2.18	0.00	21.72	34.29	0.63	38.78
07-11-2018	209.95	6.18	6.18	0.00	25.91	31.84	0.81	44.87
08-11-2018	208.49	-1.46	0.00	1.46	24.06	30.92	0.78	43.76
09-11-2018	204.47	-4.02	0.00	4.02	22.34	32.45	0.69	40.78
12-11-2018	194.17	-10.30	0.00	10.30	20.75	39.69	0.52	34.33

Table 2. MACD calculation (2018):

Date	Opening Price	High Price	Low Price	Closing Price	12 EMA	26 EMA	MACD	9 EMA
02-01-2018	170.16	172.3	169.26	172.26				
03-01-2018	172.53	174.55	171.96	172.23				
04-01-2018	172.54	173.47	172.08	173.03				
05-01-2018	173.44	175.37	173.05	175.00				
08-01-2018	174.35	175.61	173.93	174.35				
09-01-2018	174.55	175.06	173.41	174.33				
10-01-2018	173.16	174.3	173	174.29				
11-01-2018	174.59	175.49	174.49	175.28				
12-01-2018	176.18	177.36	175.65	177.09				
16-01-2018	177.90	179.39	176.14	176.19				
17-01-2018	176.15	179.25	175.07	179.10				
18-01-2018	179.37	180.1	178.25	179.26	175.20			
19-01-2018	178.61	179.58	177.41	178.46	175.70			
22-01-2018	177.30	177.78	176.6	177.00	175.90			
23-01-2018	177.30	179.44	176.82	177.04	176.08			
24-01-2018	177.25	177.3	173.2	174.22	175.79			
25-01-2018	174.51	174.95	170.53	171.11	175.07			
26-01-2018	172.00	172	170.06	171.51	174.52			
29-01-2018	170.16	170.16	167.07	167.96	173.51			
30-01-2018	165.53	167.37	164.7	166.97	172.51			
31-01-2018	166.87	168.44	166.5	167.43	171.73			
01-02-2018	167.17	168.62	166.76	167.78	171.12			
02-02-2018	166.00	166.8	160.1	160.50	169.49			
05-02-2018	159.10	163.88	156	156.49	167.49			
06-02-2018	154.83	163.72	154	163.03	166.80			
07-02-2018	163.09	163.4	159.07	159.54	165.68	171.59		
08-02-2018	160.29	161	155.03	155.15	164.06	170.38	-6.31	
09-02-2018	157.07	157.89	150.24	156.41	162.89	169.34	-6.46	
12-02-2018	158.50	163.89	157.51	162.71	162.86	168.85	-5.99	
13-02-2018	161.95	164.75	161.65	164.34	163.09	168.52	-5.43	
14-02-2018	163.04	167.54	162.88	167.37	163.75	168.43	-4.69	
15-02-2018	169.79	173.09	169	172.99	165.17	168.77	-3.60	
16-02-2018	172.36	174.82	171.77	172.43	166.28	169.04	-2.76	
20-02-2018	172.05	174.26	171.42	171.85	167.14	169.25	-2.11	-4.67
21-02-2018	172.83	174.12	171.01	171.07	167.75	169.38	-1.64	-4.06
22-02-2018	171.80	173.95	171.71	172.50	168.48	169.61	-1.14	-3.48
23-02-2018	173.67	175.65	173.54	175.50	169.56	170.05	-0.49	-2.88
26-02-2018	176.35	179.39	176.21	178.97	171.01	170.71	0.29	-2.25
27-02-2018	179.10	180.48	178.16	178.39	172.14	171.28	0.86	-1.62
28-02-2018	179.26	180.62	178.05	178.12	173.06	171.79	1.27	-1.04
01-03-2018	178.54	179.78	172.66	175.00	173.36	172.02	1.34	-0.57
02-03-2018	172.80	176.3	172.45	176.21	173.80	172.33	1.46	-0.16

05-03-2018	175.21	177.74	174.52	176.82	174.26	172.67	1.60	0.19
06-03-2018	177.91	178.25	176.13	176.67	174.63	172.96	1.67	0.49
07-03-2018	174.94	175.85	174.27	175.03	174.69	173.12	1.58	0.70
08-03-2018	175.48	177.12	175.07	176.94	175.04	173.40	1.64	0.89
09-03-2018	177.96	180	177.39	179.98	175.80	173.89	1.91	1.10
12-03-2018	180.29	182.39	180.21	181.72	176.71	174.47	2.24	1.33
13-03-2018	182.59	183.5	179.24	179.97	177.21	174.87	2.34	1.53
14-03-2018	180.32	180.52	177.81	178.44	177.40	175.14	2.26	1.67
15-03-2018	178.50	180.24	178.07	178.65	177.59	175.40	2.19	1.78
16-03-2018	178.65	179.12	177.62	178.02	177.66	175.59	2.07	1.84
19-03-2018	177.32	177.47	173.66	175.30	177.30	175.57	1.72	1.81
20-03-2018	175.24	176.8	174.94	175.24	176.98	175.55	1.43	1.74
21-03-2018	175.04	175.09	171.26	171.27	176.10	175.23	0.87	1.56
22-03-2018	170.00	172.68	168.6	168.85	174.99	174.76	0.23	1.30
23-03-2018	168.39	169.92	164.94	164.94	173.44	174.03	-0.59	0.92
26-03-2018	168.07	173.1	166.44	172.77	173.34	173.94	-0.60	0.62
27-03-2018	173.68	175.15	166.92	168.34	172.57	173.52	-0.95	0.30
28-03-2018	167.25	170.02	165.19	166.48	171.63	173.00	-1.37	-0.03
29-03-2018	167.81	171.75	166.9	167.78	171.04	172.61	-1.57	-0.34
02-04-2018	166.64	168.94	164.47	166.68	170.37	172.17	-1.81	-0.63
03-04-2018	167.64	168.75	164.88	168.39	170.06	171.89	-1.83	-0.87
04-04-2018	164.88	172.01	164.77	171.61	170.30	171.87	-1.57	-1.01
05-04-2018	172.58	174.23	172.08	172.80	170.69	171.94	-1.26	-1.06
06-04-2018	170.97	172.48	168.2	168.38	170.33	171.68	-1.35	-1.12
09-04-2018	169.88	173.09	169.85	170.05	170.29	171.56	-1.27	-1.15
10-04-2018	173.00	174	171.53	173.25	170.74	171.68	-0.94	-1.11
11-04-2018	172.23	173.92	171.7	172.44	171.00	171.74	-0.73	-1.03
12-04-2018	173.41	175	173.04	174.14	171.49	171.92	-0.43	-0.91
13-04-2018	174.78	175.84	173.85	174.73	171.99	172.13	-0.14	-0.76
16-04-2018	175.03	176.19	174.83	175.82	172.58	172.40	0.18	-0.57
17-04-2018	176.49	178.94	176.41	178.24	173.45	172.83	0.62	-0.33
18-04-2018	177.81	178.82	176.88	177.84	174.12	173.20	0.92	-0.08
19-04-2018	173.76	175.39	172.66	172.80	173.92	173.17	0.75	0.08
20-04-2018	170.60	171.22	165.43	165.72	172.66	172.62	0.04	0.07
23-04-2018	166.83	166.92	164.09	165.24	171.52	172.07	-0.56	-0.05
24-04-2018	165.67	166.33	161.22	162.94	170.20	171.40	-1.20	-0.28
25-04-2018	162.62	165.42	162.41	163.65	169.19	170.82	-1.63	-0.55
26-04-2018	164.12	165.73	163.37	164.22	168.43	170.33	-1.91	-0.82
27-04-2018	164.00	164.33	160.63	162.32	167.49	169.74	-2.25	-1.11
30-04-2018	162.13	167.26	161.84	165.26	167.14	169.41	-2.27	-1.34
01-05-2018	166.41	169.2	165.27	169.10	167.44	169.39	-1.94	-1.46
02-05-2018	175.23	177.75	173.8	176.57	168.85	169.92	-1.07	-1.38
03-05-2018	175.88	177.5	174.44	176.89	170.09	170.43	-0.35	-1.18
04-05-2018	178.25	184.25	178.17	183.83	172.20	171.43	0.77	-0.79
07-05-2018	185.18	187.67	184.75	185.16	174.19	172.44	1.75	-0.28
08-05-2018	184.99	186.22	183.67	186.05	176.02	173.45	2.57	0.29

09-05-2018	186.55	187.4	185.22	187.36	177.76	174.48	3.28	0.89
10-05-2018	187.74	190.37	187.65	190.04	179.65	175.63	4.02	1.51
11-05-2018	189.49	190.06	187.45	188.59	181.03	176.59	4.43	2.10
14-05-2018	189.01	189.53	187.86	188.15	182.12	177.45	4.67	2.61
15-05-2018	186.78	187.07	185.1	186.44	182.79	178.12	4.67	3.02
16-05-2018	186.07	188.46	186	188.18	183.62	178.86	4.76	3.37
17-05-2018	188.00	188.91	186.36	186.99	184.14	179.46	4.67	3.63
18-05-2018	187.19	187.81	186.13	186.31	184.47	179.97	4.50	3.80
21-05-2018	188.00	189.27	186.91	187.63	184.96	180.54	4.42	3.93
22-05-2018	188.38	188.88	186.78	187.16	185.30	181.03	4.27	4.00
23-05-2018	186.35	188.5	185.76	188.36	185.77	181.57	4.20	4.04
24-05-2018	188.77	188.84	186.21	188.15	186.13	182.06	4.07	4.04
25-05-2018	188.23	189.65	187.65	188.58	186.51	182.54	3.97	4.03
29-05-2018	187.60	188.75	186.87	187.90	186.72	182.94	3.78	3.98
30-05-2018	187.72	188	186.78	187.50	186.84	183.28	3.57	3.90
31-05-2018	187.22	188.23	186.14	186.87	186.85	183.54	3.30	3.78
01-06-2018	187.99	190.26	187.75	190.24	187.37	184.04	3.33	3.69
04-06-2018	191.64	193.42	191.35	191.83	188.06	184.62	3.44	3.64
05-06-2018	193.07	193.94	192.36	193.31	188.86	185.26	3.60	3.63
06-06-2018	193.63	194.08	191.92	193.98	189.65	185.91	3.74	3.65
07-06-2018	194.14	194.2	192.34	193.46	190.24	186.47	3.77	3.68
08-06-2018	191.17	192	189.77	191.70	190.46	186.85	3.61	3.66
11-06-2018	191.35	191.97	190.21	191.23	190.58	187.18	3.40	3.61
12-06-2018	191.39	192.61	191.15	192.28	190.84	187.56	3.29	3.55
13-06-2018	192.42	192.88	190.44	190.70	190.82	187.79	3.03	3.44
14-06-2018	191.55	191.57	190.22	190.80	190.82	188.01	2.81	3.32
15-06-2018	190.03	190.16	188.26	188.84	190.51	188.07	2.44	3.14
18-06-2018	187.88	189.22	187.2	188.74	190.24	188.12	2.12	2.94
19-06-2018	185.14	186.33	183.45	185.69	189.54	187.94	1.60	2.67
20-06-2018	186.35	187.2	185.73	186.50	189.07	187.84	1.24	2.38
21-06-2018	187.25	188.35	184.94	185.46	188.52	187.66	0.86	2.08
22-06-2018	186.12	186.15	184.7	184.92	187.96	187.46	0.51	1.76
25-06-2018	183.40	184.92	180.73	182.17	187.07	187.06	0.01	1.41
26-06-2018	182.99	186.53	182.54	184.43	186.67	186.87	-0.20	1.09
27-06-2018	185.23	187.28	184.03	184.16	186.28	186.67	-0.39	0.79
28-06-2018	184.10	186.21	183.8	185.50	186.16	186.58	-0.42	0.55
29-06-2018	186.29	187.19	182.91	185.11	186.00	186.47	-0.47	0.35
02-07-2018	183.82	187.3	183.42	187.18	186.18	186.53	-0.35	0.21
03-07-2018	187.79	187.95	183.54	183.92	185.83	186.33	-0.50	0.07
05-07-2018	185.26	186.41	184.28	185.40	185.77	186.26	-0.50	-0.05
06-07-2018	185.42	188.43	185.2	187.97	186.11	186.39	-0.28	-0.09
09-07-2018	189.50	190.68	189.3	190.58	186.79	186.70	0.09	-0.06
10-07-2018	190.71	191.28	190.18	190.35	187.34	186.97	0.37	0.03
11-07-2018	188.50	189.78	187.61	187.88	187.42	187.04	0.39	0.10
12-07-2018	189.53	191.41	189.31	191.03	187.98	187.33	0.64	0.21
13-07-2018	191.08	191.84	190.9	191.33	188.49	187.63	0.86	0.34

16-07-2018	191.52	192.65	190.42	190.91	188.87	187.87	0.99	0.47
17-07-2018	189.75	191.87	189.2	191.45	189.26	188.14	1.13	0.60
18-07-2018	191.78	191.8	189.93	190.40	189.44	188.31	1.13	0.71
19-07-2018	189.69	192.55	189.69	191.88	189.81	188.57	1.24	0.82
20-07-2018	191.78	192.43	190.17	191.44	190.06	188.78	1.28	0.91
23-07-2018	190.68	191.96	189.56	191.61	190.30	188.99	1.31	0.99
24-07-2018	192.45	193.66	192.05	193.00	190.72	189.29	1.43	1.08
25-07-2018	193.06	194.85	192.43	194.82	191.35	189.70	1.65	1.19
26-07-2018	194.61	195.96	193.61	194.21	191.79	190.03	1.76	1.30
27-07-2018	194.99	195.19	190.1	190.98	191.66	190.10	1.56	1.36
30-07-2018	191.90	192.2	189.07	189.91	191.39	190.09	1.31	1.35
31-07-2018	190.30	192.14	189.34	190.29	191.22	190.10	1.12	1.30
01-08-2018	199.13	201.76	197.31	201.50	192.81	190.95	1.86	1.41
02-08-2018	200.58	208.38	200.35	207.39	195.05	192.17	2.88	1.71
03-08-2018	207.03	208.74	205.48	207.99	197.04	193.34	3.70	2.11
06-08-2018	208.00	209.25	207.07	209.07	198.89	194.50	4.39	2.56
07-08-2018	209.32	209.5	206.76	207.11	200.16	195.44	4.72	2.99
08-08-2018	206.05	207.81	204.52	207.25	201.25	196.31	4.93	3.38
09-08-2018	209.53	209.78	207.2	208.88	202.42	197.24	5.18	3.74
10-08-2018	207.36	209.1	206.67	207.53	203.21	198.01	5.20	4.03
13-08-2018	209.31	210.95	207.7	208.87	204.08	198.81	5.27	4.28
14-08-2018	210.16	210.56	208.26	209.75	204.95	199.62	5.33	4.49
15-08-2018	209.22	210.74	208.33	210.24	205.76	200.41	5.36	4.66
16-08-2018	211.75	213.81	211.47	213.32	206.93	201.36	5.56	4.84
17-08-2018	213.44	217.95	213.16	217.58	208.57	202.56	6.00	5.08
20-08-2018	218.10	219.18	215.11	215.46	209.63	203.52	6.11	5.28
21-08-2018	216.80	217.19	214.03	215.04	210.46	204.37	6.09	5.44
22-08-2018	214.10	216.36	213.84	215.05	211.17	205.16	6.00	5.55
23-08-2018	214.65	217.05	214.6	215.49	211.83	205.93	5.90	5.62
24-08-2018	216.60	216.9	215.11	216.16	212.50	206.69	5.81	5.66
27-08-2018	217.15	218.74	216.33	217.94	213.33	207.52	5.81	5.69
28-08-2018	219.01	220.54	218.92	219.70	214.31	208.42	5.89	5.73
29-08-2018	220.15	223.49	219.41	222.98	215.65	209.50	6.15	5.81
30-08-2018	223.25	228.26	222.4	225.03	217.09	210.65	6.44	5.94
31-08-2018	226.51	228.87	226	227.63	218.71	211.91	6.80	6.11
04-09-2018	228.41	229.18	226.63	228.36	220.20	213.13	7.07	6.30
05-09-2018	228.99	229.67	225.1	226.87	221.22	214.15	7.08	6.46
06-09-2018	226.23	227.35	221.3	223.10	221.51	214.81	6.70	6.51
07-09-2018	221.85	225.37	220.71	221.30	221.48	215.29	6.19	6.44
10-09-2018	220.95	221.85	216.47	218.33	220.99	215.51	5.48	6.25
11-09-2018	218.01	224.3	216.56	223.85	221.43	216.13	5.30	6.06
12-09-2018	224.94	225	219.84	221.07	221.38	216.50	4.88	5.82
13-09-2018	223.52	228.35	222.57	226.41	222.15	217.23	4.92	5.64
14-09-2018	225.75	226.84	222.52	223.84	222.41	217.72	4.69	5.45
17-09-2018	222.15	222.95	217.27	217.88	221.71	217.73	3.98	5.16
18-09-2018	217.79	221.85	217.12	218.24	221.18	217.77	3.41	4.81

19-09-2018	218.50	219.62	215.3	218.37	220.75	217.82	2.93	4.43
20-09-2018	220.24	222.28	219.15	220.03	220.64	217.98	2.66	4.08
21-09-2018	220.78	221.36	217.29	217.66	220.18	217.96	2.22	3.71
24-09-2018	216.82	221.26	216.63	220.79	220.27	218.17	2.11	3.39
25-09-2018	219.75	222.82	219.7	222.19	220.57	218.46	2.10	3.13
26-09-2018	221.00	223.75	219.76	220.42	220.55	218.61	1.94	2.89
27-09-2018	223.82	226.44	223.54	224.95	221.22	219.08	2.14	2.74
28-09-2018	224.79	225.84	224.02	225.74	221.92	219.57	2.35	2.66
01-10-2018	227.95	229.42	226.35	227.26	222.74	220.14	2.60	2.65
02-10-2018	227.25	230	226.63	229.28	223.75	220.82	2.93	2.71
03-10-2018	230.05	233.47	229.78	232.07	225.03	221.65	3.37	2.84
04-10-2018	230.78	232.35	226.73	227.99	225.48	222.12	3.36	2.94
05-10-2018	227.96	228.41	220.58	224.29	225.30	222.28	3.02	2.96
08-10-2018	222.21	224.8	220.2	223.77	225.06	222.39	2.67	2.90
09-10-2018	223.64	227.27	222.25	226.87	225.34	222.72	2.62	2.84
10-10-2018	225.46	226.35	216.05	216.36	223.96	222.25	1.71	2.62
11-10-2018	214.52	219.5	212.32	214.45	222.50	221.67	0.82	2.26
12-10-2018	220.42	222.88	216.84	222.11	222.44	221.71	0.73	1.95
15-10-2018	221.16	221.83	217.27	217.36	221.66	221.38	0.27	1.62
16-10-2018	218.93	222.99	216.76	222.15	221.73	221.44	0.29	1.35
17-10-2018	222.30	222.64	219.34	221.19	221.65	221.42	0.23	1.13
18-10-2018	217.86	219.74	213	216.02	220.78	221.02	-0.24	0.85
19-10-2018	218.06	221.26	217.43	219.31	220.56	220.90	-0.34	0.61
22-10-2018	219.79	223.36	218.94	220.65	220.57	220.88	-0.31	0.43
23-10-2018	215.83	223.25	214.7	222.73	220.90	221.01	-0.11	0.32
24-10-2018	222.60	224.23	214.54	215.09	220.01	220.58	-0.57	0.14
25-10-2018	217.71	221.38	216.75	219.80	219.98	220.52	-0.54	0.01
26-10-2018	215.90	220.19	212.67	216.30	219.41	220.21	-0.80	-0.15
29-10-2018	219.19	219.69	206.09	212.24	218.31	219.62	-1.31	-0.38
30-10-2018	211.15	215.18	209.27	213.30	217.54	219.15	-1.61	-0.63
31-10-2018	216.88	220.45	216.62	218.86	217.74	219.13	-1.39	-0.78
01-11-2018	219.05	222.36	216.81	222.22	218.43	219.36	-0.93	-0.81
02-11-2018	209.55	213.65	205.43	207.48	216.75	218.48	-1.73	-0.99
05-11-2018	204.30	204.39	198.17	201.59	214.41	217.23	-2.81	-1.36
06-11-2018	201.92	204.72	201.69	203.77	212.78	216.23	-3.45	-1.78
07-11-2018	205.97	210.06	204.13	209.95	212.34	215.76	-3.42	-2.11
08-11-2018	209.98	210.12	206.75	208.49	211.75	215.22	-3.48	-2.38
09-11-2018	205.55	206.01	202.25	204.47	210.63	214.43	-3.80	-2.66
12-11-2018	199.00	199.85	193.79	194.17	208.10	212.93	-4.83	-3.10

Table 3. Stochastic Calculation (2018):

Date	Open Price	High Price	Low Price	Close Price	High 14	Low 14	%k	%D
02-01-2018	170.16	172.3	169.26	172.26				
03-01-2018	172.53	174.55	171.96	172.23				
04-01-2018	172.54	173.47	172.08	173.03				
05-01-2018	173.44	175.37	173.05	175.00				
08-01-2018	174.35	175.61	173.93	174.35				
09-01-2018	174.55	175.06	173.41	174.33				
10-01-2018	173.16	174.3	173	174.29				
11-01-2018	174.59	175.49	174.49	175.28				
12-01-2018	176.18	177.36	175.65	177.09				
16-01-2018	177.90	179.39	176.14	176.19				
17-01-2018	176.15	179.25	175.07	179.10				
18-01-2018	179.37	180.1	178.25	179.26				
19-01-2018	178.61	179.58	177.41	178.46				
22-01-2018	177.30	177.78	176.6	177.00	180.1	169.26	71.40	
23-01-2018	177.30	179.44	176.82	177.04	180.1	171.96	62.41	
24-01-2018	177.25	177.3	173.2	174.22	180.1	172.08	26.68	53.50
25-01-2018	174.51	174.95	170.53	171.11	180.1	170.53	6.06	31.72
26-01-2018	172.00	172	170.06	171.51	180.1	170.06	14.44	15.73
29-01-2018	170.16	170.16	167.07	167.96	180.1	167.07	6.83	9.11
30-01-2018	165.53	167.37	164.7	166.97	180.1	164.7	14.74	12.00
31-01-2018	166.87	168.44	166.5	167.43	180.1	164.7	17.73	13.10
01-02-2018	167.17	168.62	166.76	167.78	180.1	164.7	20.00	17.49
02-02-2018	166.00	166.8	160.1	160.50	180.1	160.1	2.00	13.24
05-02-2018	159.10	163.88	156	156.49	180.1	156	2.03	8.01
06-02-2018	154.83	163.72	154	163.03	180.1	154	34.60	12.88
07-02-2018	163.09	163.4	159.07	159.54	179.58	154	21.66	19.43
08-02-2018	160.29	161	155.03	155.15	179.44	154	4.52	20.26
09-02-2018	157.07	157.89	150.24	156.41	179.44	150.24	21.13	15.77
12-02-2018	158.50	163.89	157.51	162.71	177.3	150.24	46.08	23.91
13-02-2018	161.95	164.75	161.65	164.34	174.95	150.24	57.06	41.42
14-02-2018	163.04	167.54	162.88	167.37	172	150.24	78.72	60.62
15-02-2018	169.79	173.09	169	172.99	173.09	150.24	99.56	78.45
16-02-2018	172.36	174.82	171.77	172.43	174.82	150.24	90.28	89.52
20-02-2018	172.05	174.26	171.42	171.85	174.82	150.24	87.92	92.59
21-02-2018	172.83	174.12	171.01	171.07	174.82	150.24	84.74	87.65
22-02-2018	171.80	173.95	171.71	172.50	174.82	150.24	90.56	87.74
23-02-2018	173.67	175.65	173.54	175.50	175.65	150.24	99.41	91.57
26-02-2018	176.35	179.39	176.21	178.97	179.39	150.24	98.56	96.18
27-02-2018	179.10	180.48	178.16	178.39	180.48	150.24	93.09	97.02
28-02-2018	179.26	180.62	178.05	178.12	180.62	150.24	91.77	94.47
01-03-2018	178.54	179.78	172.66	175.00	180.62	150.24	81.50	88.79
02-03-2018	172.80	176.3	172.45	176.21	180.62	157.51	80.92	84.73
05-03-2018	175.21	177.74	174.52	176.82	180.62	161.65	79.97	80.80

06-03-2018	177.91	178.25	176.13	176.67	180.62	162.88	77.73	79.54
07-03-2018	174.94	175.85	174.27	175.03	180.62	169	51.89	69.87
08-03-2018	175.48	177.12	175.07	176.94	180.62	171.01	61.71	63.78
09-03-2018	177.96	180	177.39	179.98	180.62	171.01	93.34	68.98
12-03-2018	180.29	182.39	180.21	181.72	182.39	171.01	94.11	83.05
13-03-2018	182.59	183.5	179.24	179.97	183.5	171.71	70.06	85.84
14-03-2018	180.32	180.52	177.81	178.44	183.5	172.45	54.21	72.79
15-03-2018	178.50	180.24	178.07	178.65	183.5	172.45	56.11	60.13
16-03-2018	178.65	179.12	177.62	178.02	183.5	172.45	50.41	53.57
19-03-2018	177.32	177.47	173.66	175.30	183.5	172.45	25.79	44.10
20-03-2018	175.24	176.8	174.94	175.24	183.5	172.45	25.25	33.82
21-03-2018	175.04	175.09	171.26	171.27	183.5	171.26	0.08	17.04
22-03-2018	170.00	172.68	168.6	168.85	183.5	168.6	1.68	9.00
23-03-2018	168.39	169.92	164.94	164.94	183.5	164.94	0.00	0.59
26-03-2018	168.07	173.1	166.44	172.77	183.5	164.94	42.19	14.62
27-03-2018	173.68	175.15	166.92	168.34	183.5	164.94	18.32	20.17
28-03-2018	167.25	170.02	165.19	166.48	183.5	164.94	8.30	22.93
29-03-2018	167.81	171.75	166.9	167.78	183.5	164.94	15.30	13.97
02-04-2018	166.64	168.94	164.47	166.68	183.5	164.47	11.61	11.74
03-04-2018	167.64	168.75	164.88	168.39	180.52	164.47	24.42	17.11
04-04-2018	164.88	172.01	164.77	171.61	180.24	164.47	45.28	27.10
05-04-2018	172.58	174.23	172.08	172.80	179.12	164.47	56.86	42.19
06-04-2018	170.97	172.48	168.2	168.38	177.47	164.47	30.08	44.07
09-04-2018	169.88	173.09	169.85	170.05	176.8	164.47	45.26	44.06
10-04-2018	173.00	174	171.53	173.25	175.15	164.47	82.21	52.51
11-04-2018	172.23	173.92	171.7	172.44	175.15	164.47	74.63	67.36
12-04-2018	173.41	175	173.04	174.14	175.15	164.47	90.54	82.46
13-04-2018	174.78	175.84	173.85	174.73	175.84	164.47	90.24	85.14
16-04-2018	175.03	176.19	174.83	175.82	176.19	164.47	96.84	92.54
17-04-2018	176.49	178.94	176.41	178.24	178.94	164.47	95.16	94.08
18-04-2018	177.81	178.82	176.88	177.84	178.94	164.47	92.40	94.80
19-04-2018	173.76	175.39	172.66	172.80	178.94	164.47	57.57	81.71
20-04-2018	170.60	171.22	165.43	165.72	178.94	164.77	6.70	52.22
23-04-2018	166.83	166.92	164.09	165.24	178.94	164.09	7.74	24.01
24-04-2018	165.67	166.33	161.22	162.94	178.94	161.22	9.71	8.05
25-04-2018	162.62	165.42	162.41	163.65	178.94	161.22	13.71	10.39
26-04-2018	164.12	165.73	163.37	164.22	178.94	161.22	16.93	13.45
27-04-2018	164.00	164.33	160.63	162.32	178.94	160.63	9.23	13.29
30-04-2018	162.13	167.26	161.84	165.26	178.94	160.63	25.29	17.15
01-05-2018	166.41	169.2	165.27	169.10	178.94	160.63	46.26	26.93
02-05-2018	175.23	177.75	173.8	176.57	178.94	160.63	87.06	52.87
03-05-2018	175.88	177.5	174.44	176.89	178.94	160.63	88.80	74.04
04-05-2018	178.25	184.25	178.17	183.83	184.25	160.63	98.22	91.36
07-05-2018	185.18	187.67	184.75	185.16	187.67	160.63	90.72	92.58
08-05-2018	184.99	186.22	183.67	186.05	187.67	160.63	94.01	94.32
09-05-2018	186.55	187.4	185.22	187.36	187.67	160.63	98.85	94.53

10-05-2018	187.74	190.37	187.65	190.04	190.37	160.63	98.89	97.25
11-05-2018	189.49	190.06	187.45	188.59	190.37	160.63	94.01	97.25
14-05-2018	189.01	189.53	187.86	188.15	190.37	160.63	92.54	95.15
15-05-2018	186.78	187.07	185.1	186.44	190.37	160.63	86.79	91.11
16-05-2018	186.07	188.46	186	188.18	190.37	160.63	92.64	90.65
17-05-2018	188.00	188.91	186.36	186.99	190.37	161.84	88.15	89.19
18-05-2018	187.19	187.81	186.13	186.31	190.37	165.27	83.82	88.20
21-05-2018	188.00	189.27	186.91	187.63	190.37	173.8	83.46	85.15
22-05-2018	188.38	188.88	186.78	187.16	190.37	174.44	79.85	82.38
23-05-2018	186.35	188.5	185.76	188.36	190.37	178.17	83.52	82.28
24-05-2018	188.77	188.84	186.21	188.15	190.37	183.67	66.87	76.75
25-05-2018	188.23	189.65	187.65	188.58	190.37	183.67	73.28	74.56
29-05-2018	187.60	188.75	186.87	187.90	190.37	185.1	53.13	64.43
30-05-2018	187.72	188	186.78	187.50	190.37	185.1	45.54	57.32
31-05-2018	187.22	188.23	186.14	186.87	190.06	185.1	35.69	44.79
01-06-2018	187.99	190.26	187.75	190.24	190.26	185.1	99.61	60.28
04-06-2018	191.64	193.42	191.35	191.83	193.42	185.1	80.89	72.06
05-06-2018	193.07	193.94	192.36	193.31	193.94	185.76	92.30	90.93
06-06-2018	193.63	194.08	191.92	193.98	194.08	185.76	98.80	90.66
07-06-2018	194.14	194.2	192.34	193.46	194.2	185.76	91.23	94.11
08-06-2018	191.17	192	189.77	191.70	194.2	185.76	70.38	86.80
11-06-2018	191.35	191.97	190.21	191.23	194.2	185.76	64.81	75.47
12-06-2018	191.39	192.61	191.15	192.28	194.2	185.76	77.25	70.81
13-06-2018	192.42	192.88	190.44	190.70	194.2	186.14	56.58	66.21
14-06-2018	191.55	191.57	190.22	190.80	194.2	186.14	57.82	63.88
15-06-2018	190.03	190.16	188.26	188.84	194.2	186.14	33.50	49.30
18-06-2018	187.88	189.22	187.2	188.74	194.2	186.14	32.26	41.19
19-06-2018	185.14	186.33	183.45	185.69	194.2	183.45	20.84	28.86
20-06-2018	186.35	187.2	185.73	186.50	194.2	183.45	28.37	27.16
21-06-2018	187.25	188.35	184.94	185.46	194.2	183.45	18.70	22.64
22-06-2018	186.12	186.15	184.7	184.92	194.2	183.45	13.67	20.25
25-06-2018	183.40	184.92	180.73	182.17	194.2	180.73	10.69	14.35
26-06-2018	182.99	186.53	182.54	184.43	194.2	180.73	27.47	17.28
27-06-2018	185.23	187.28	184.03	184.16	192.88	180.73	28.23	22.13
28-06-2018	184.10	186.21	183.8	185.50	192.88	180.73	39.26	31.65
29-06-2018	186.29	187.19	182.91	185.11	192.88	180.73	36.05	34.51
02-07-2018	183.82	187.3	183.42	187.18	192.88	180.73	53.09	42.80
03-07-2018	187.79	187.95	183.54	183.92	191.57	180.73	29.43	39.52
05-07-2018	185.26	186.41	184.28	185.40	190.16	180.73	49.52	44.01
06-07-2018	185.42	188.43	185.2	187.97	189.22	180.73	85.28	54.74
09-07-2018	189.50	190.68	189.3	190.58	190.68	180.73	99.00	77.93
10-07-2018	190.71	191.28	190.18	190.35	191.28	180.73	91.18	91.82
11-07-2018	188.50	189.78	187.61	187.88	191.28	180.73	67.77	85.98
12-07-2018	189.53	191.41	189.31	191.03	191.41	180.73	96.44	85.13
13-07-2018	191.08	191.84	190.9	191.33	191.84	180.73	95.41	86.54
16-07-2018	191.52	192.65	190.42	190.91	192.65	182.54	82.79	91.55

17-07-2018	189.75	191.87	189.2	191.45	192.65	182.91	87.68	88.63
18-07-2018	191.78	191.8	189.93	190.40	192.65	182.91	76.90	82.46
19-07-2018	189.69	192.55	189.69	191.88	192.65	182.91	92.09	85.56
20-07-2018	191.78	192.43	190.17	191.44	192.65	183.42	86.89	85.29
23-07-2018	190.68	191.96	189.56	191.61	192.65	183.54	88.58	89.19
24-07-2018	192.45	193.66	192.05	193.00	193.66	184.28	92.96	89.48
25-07-2018	193.06	194.85	192.43	194.82	194.85	185.2	99.69	93.75
26-07-2018	194.61	195.96	193.61	194.21	195.96	187.61	79.04	90.56
27-07-2018	194.99	195.19	190.1	190.98	195.96	187.61	40.36	73.03
30-07-2018	191.90	192.2	189.07	189.91	195.96	187.61	27.54	48.98
31-07-2018	190.30	192.14	189.34	190.29	195.96	189.07	17.71	28.54
01-08-2018	199.13	201.76	197.31	201.50	201.76	189.07	97.95	47.73
02-08-2018	200.58	208.38	200.35	207.39	208.38	189.07	94.87	70.18
03-08-2018	207.03	208.74	205.48	207.99	208.74	189.07	96.19	96.34
06-08-2018	208.00	209.25	207.07	209.07	209.25	189.07	99.11	96.72
07-08-2018	209.32	209.5	206.76	207.11	209.5	189.07	88.30	94.53
08-08-2018	206.05	207.81	204.52	207.25	209.5	189.07	88.99	92.13
09-08-2018	209.53	209.78	207.2	208.88	209.78	189.07	95.65	90.98
10-08-2018	207.36	209.1	206.67	207.53	209.78	189.07	89.14	91.26
13-08-2018	209.31	210.95	207.7	208.87	210.95	189.07	90.49	91.76
14-08-2018	210.16	210.56	208.26	209.75	210.95	189.07	94.52	91.38
15-08-2018	209.22	210.74	208.33	210.24	210.95	189.07	96.76	93.92
16-08-2018	211.75	213.81	211.47	213.32	213.81	189.07	98.02	96.43
17-08-2018	213.44	217.95	213.16	217.58	217.95	189.34	98.71	97.83
20-08-2018	218.10	219.18	215.11	215.46	219.18	197.31	82.99	93.24
21-08-2018	216.80	217.19	214.03	215.04	219.18	200.35	78.01	86.57
22-08-2018	214.10	216.36	213.84	215.05	219.18	204.52	71.83	77.61
23-08-2018	214.65	217.05	214.6	215.49	219.18	204.52	74.83	74.89
24-08-2018	216.60	216.9	215.11	216.16	219.18	204.52	79.40	75.35
27-08-2018	217.15	218.74	216.33	217.94	219.18	204.52	91.54	81.92
28-08-2018	219.01	220.54	218.92	219.70	220.54	206.67	93.94	88.30
29-08-2018	220.15	223.49	219.41	222.98	223.49	206.67	96.97	94.15
30-08-2018	223.25	228.26	222.4	225.03	228.26	207.7	84.29	91.73
31-08-2018	226.51	228.87	226	227.63	228.87	208.26	93.98	91.75
04-09-2018	228.41	229.18	226.63	228.36	229.18	208.33	96.07	91.45
05-09-2018	228.99	229.67	225.1	226.87	229.67	211.47	84.62	91.56
06-09-2018	226.23	227.35	221.3	223.10	229.67	213.16	60.21	80.30
07-09-2018	221.85	225.37	220.71	221.30	229.67	213.84	47.13	63.98
10-09-2018	220.95	221.85	216.47	218.33	229.67	213.84	28.36	45.23
11-09-2018	218.01	224.3	216.56	223.85	229.67	213.84	63.23	46.24
12-09-2018	224.94	225	219.84	221.07	229.67	214.6	42.93	44.84
13-09-2018	223.52	228.35	222.57	226.41	229.67	215.11	77.61	61.26
14-09-2018	225.75	226.84	222.52	223.84	229.67	216.33	56.30	58.95
17-09-2018	222.15	222.95	217.27	217.88	229.67	216.47	10.68	48.20
18-09-2018	217.79	221.85	217.12	218.24	229.67	216.47	13.41	26.80
19-09-2018	218.50	219.62	215.3	218.37	229.67	215.3	21.36	15.15

20-09-2018	220.24	222.28	219.15	220.03	229.67	215.3	32.92	22.56
21-09-2018	220.78	221.36	217.29	217.66	229.67	215.3	16.42	23.57
24-09-2018	216.82	221.26	216.63	220.79	229.67	215.3	38.20	29.18
25-09-2018	219.75	222.82	219.7	222.19	228.35	215.3	52.80	35.81
26-09-2018	221.00	223.75	219.76	220.42	228.35	215.3	39.23	43.41
27-09-2018	223.82	226.44	223.54	224.95	228.35	215.3	73.95	55.33
28-09-2018	224.79	225.84	224.02	225.74	228.35	215.3	80.00	64.39
01-10-2018	227.95	229.42	226.35	227.26	229.42	215.3	84.70	79.55
02-10-2018	227.25	230	226.63	229.28	230	215.3	95.10	86.60
03-10-2018	230.05	233.47	229.78	232.07	233.47	215.3	92.30	90.70
04-10-2018	230.78	232.35	226.73	227.99	233.47	215.3	69.84	85.75
05-10-2018	227.96	228.41	220.58	224.29	233.47	215.3	49.48	70.54
08-10-2018	222.21	224.8	220.2	223.77	233.47	215.3	46.62	55.31
09-10-2018	223.64	227.27	222.25	226.87	233.47	216.63	60.81	52.30
10-10-2018	225.46	226.35	216.05	216.36	233.47	216.05	1.78	36.40
11-10-2018	214.52	219.5	212.32	214.45	233.47	212.32	10.07	24.22
12-10-2018	220.42	222.88	216.84	222.11	233.47	212.32	46.29	19.38
15-10-2018	221.16	221.83	217.27	217.36	233.47	212.32	23.83	26.73
16-10-2018	218.93	222.99	216.76	222.15	233.47	212.32	46.48	38.87
17-10-2018	222.30	222.64	219.34	221.19	233.47	212.32	41.94	37.42
18-10-2018	217.86	219.74	213	216.02	233.47	212.32	17.49	35.30
19-10-2018	218.06	221.26	217.43	219.31	233.47	212.32	33.05	30.83
22-10-2018	219.79	223.36	218.94	220.65	233.47	212.32	39.39	29.98
23-10-2018	215.83	223.25	214.7	222.73	232.35	212.32	51.97	41.47
24-10-2018	222.60	224.23	214.54	215.09	228.41	212.32	17.22	36.19
25-10-2018	217.71	221.38	216.75	219.80	227.27	212.32	50.03	39.74
26-10-2018	215.90	220.19	212.67	216.30	227.27	212.32	26.62	31.29
29-10-2018	219.19	219.69	206.09	212.24	226.35	206.09	30.36	35.67
30-10-2018	211.15	215.18	209.27	213.30	224.23	206.09	39.75	32.24
31-10-2018	216.88	220.45	216.62	218.86	224.23	206.09	70.40	46.83
01-11-2018	219.05	222.36	216.81	222.22	224.23	206.09	88.92	66.35
02-11-2018	209.55	213.65	205.43	207.48	224.23	205.43	10.90	56.74
05-11-2018	204.30	204.39	198.17	201.59	224.23	198.17	13.12	37.65
06-11-2018	201.92	204.72	201.69	203.77	224.23	198.17	21.49	15.17
07-11-2018	205.97	210.06	204.13	209.95	224.23	198.17	45.20	26.61
08-11-2018	209.98	210.12	206.75	208.49	224.23	198.17	39.60	35.43
09-11-2018	205.55	206.01	202.25	204.47	224.23	198.17	24.17	36.33
12-11-2018	199.00	199.85	193.79	194.17	224.23	193.79	1.25	21.67