

Chapter I

INTRODUCTION

1.1 Background of the Study

Appel (2005) stated that technical analysis is meant for every investor who has been hurt trusting his brokerage firm, trusting his friendly mutual fund manager, or trusting the latest hot guru. It is meant for every investor who has ever wished for the skills required to deal with an increasingly volatile and uncertain stock market. It is meant for every investor willing to take responsibility for the outcome of his own investments. It is meant for every investor ready to take at least some of the time and to put forth at least some of the effort required for the quest.

The principles of technical analysis derive from the observation of financial markets over hundreds of years. The oldest known hints of technical analysis appear in Joseph de la Vega's accounts of the Dutch markets in the 17th century. According to historical records, a great Japanese rice trader named Homma Munehisa (1724-1803) developed a form of Technical Analysis known as candlestick charting and is today a main charting tool. A candlestick chart is a style of bar-chart used primarily to describe price movements of securities, derivatives, and currencies over time. It combines aspects of a line-chart and a bar-chart, in that each bar represents the range of price movement over a given time interval. It is most often used in Technical Analysis of equity and currency price patterns.

Technical analysis is used to forecast the price movement of virtually any tradable instrument that is generally subject to forces of supply and demand, including stocks, bonds, futures and currency pairs. Technical analysts apply technical indicators to charts of various timeframes. Short-term traders may use charts ranging from one-minute timeframes to hourly or four-hour timeframes, while traders analyzing longer-term price movement scrutinize daily, weekly or monthly charts.

Charles Dow and his partner Edward Jones founded Dow Jones & Company in 1882. Most technicians and students of the markets concur that much of what we call technical analysis today has its origins in theories first proposed by Dow around the turn of the century. Most technicians today recognize and assimilate Dow's basic ideas, whether or not they recognize the source. Dow Theory still forms the cornerstone of the study of technical analysis, even in the face of today's sophisticated computer technology, and the proliferation of newer and supposedly better technical indicators (John Murphy, 1999). On July 3rd 1884, Dow published the first stock market average composed of the closing prices of eleven stocks: nine railroad companies and two manufacturing firms. Dow felt that these eleven stocks provided a good indication of the economic health of the country. In 1897, Dow determined that two separate indices would better represent that health, and created a 12 stock industrial index and a 20 stock rail index. By 1928 the industrial index had grown to include 30 stocks, the number at which it stands today.

As is obvious, early technical analysis was almost exclusively the analysis of charts, because the processing power of computers was not available for statistical analysis. Charles Dow reportedly originated a form of chart analysis used by technicians—point and figure analysis. Dow Theory is based on the collected writings of Dow Jones co-founder and editor Charles Dow, and inspired the use and development of modern technical analysis from the end of the 19th century. In the 1920s and 1930s Richard W. Schabacker published several books which continued the work of Dow and William Peter Hamilton in his books *Stock Market Theory and Practice* and *Technical Market Analysis*. In 1948 Edwards and John Magee published *Technical Analysis of Stock Trends* which is widely considered to be one of the seminal works of the discipline. It is exclusively concerned with trend analysis and chart patterns and remains in use to the present. Other pioneers of analysis techniques include Ralph Nelson Elliott, William Delbert Gann and Richard Wyckoff who developed their respective techniques in the early 20th century. Many more technical tools and theories have been developed and enhanced in recent decades, with an increasing emphasis on computer-assisted techniques.

Technical analysis is often criticized by academics for its lack of scientific and statistical validation (Murphy, 1999). In response, technical analysts often argue that technical analysis is a pragmatic discipline, largely interested in what works rather than existing theory. The fact remains, though, that a number of methods in technical analysis are highly subjective in nature, and critics often claim that price patterns and indicators used by practitioners of technical analysis is more in the mind and eye of the beholder. Nevertheless, practitioners vividly portray the utility of technical analysis, and its popularity has grown significantly during the past 10 years.

1.2 Statement of the Problem

Where and how to invest one's money is a problem that many individuals face. Despite the large amount of money and interest embedded into this problem, there is still no definitive answer on when and where money should be invested. Due to this, most people either keep their money in the bank or hand it off to someone else to manage. Investing in stock will be an option. There are many ways to analyze the share price in the market. But rather than using different methods, mostly investors are investing according to their wishes and rumors. The reason behind their behaviour is lack of knowledge of appropriate method in which technical skills are needed. Nowadays people can get up to date to share price due to technology but due to lack of time and skill, they find it difficult to look deeper to the current scenario. Many websites show today's price, floor sheet etc, they may track current situation of the price but cannot predict future trend momentum. In this context, the easy way to predict future trend momentum is by using technical analysis. It will give a clear view on price pattern on stock market.

This is the reason where this work looks to develop an automated trading system that can be used to make more money off trading securities than the traditional buy-and-hold strategy and to reduce the risk involved in making these investments. Stock investment requires meticulous planning and careful evaluation of the underlying stock before making investment. A statistical data in the recent past indicated that 95 per cent of the investors in the stock markets are losers, since they undertake investment without any information and without discipline. It is much required for the

investors to study the market and to understand market psychology so that they can make optimal decisions. This study attempts to answer following questions:

- What type of security to buy?
- When to sell the securities?
- Which stock to invest?

1.3 Objectives of the Study

The main objective of this study is to perform a technical analysis of the selected stocks. To achieve the main objective of the study , two specific objectives have been formulated as follows:

- To assess the status of Moving Average Convergence Divergence and Relative Strength Index of equity shares of sample banks for making ‘buy or sell’ decision
- To analyze the trend of the share prices of the sample through Moving Average Convergence Divergence and Relative Strength Index.

1.4 Significance of the Study

Technical analysts have just been spreading its base in stock market. This present study is focused on determining stock pattern through Moving Average Convergence Divergence and Relative Strength Index. This study has to assess ability and suitability of Moving Average Convergence Divergence and Relative Strength Index for listed stock of NEPSE.

Through this study, identifying technical historical trading patterns on the charts that include trading volume and buyer versus seller activity all allow the trader to predict a new trend, a trend reversal, and the strength of such trends. In this way timely entry and exit points can potentially be predicted for the greatest potential profit. Technical indicators and triggers are useful to track and figure in the historical price and volume buy and sell movements of a stock (history repeats itself) which reveals patterns of trading thresholds for given time frames so as to obtain a stock's average price movement in the present and potential price movement for the future.

1.5 Definition of Terms

Technical analysis: In finance, technical analysis is an analysis methodology for forecasting the direction of prices through the study of past market data, primarily price and volume.

Stock: A stock is a type of security that signifies ownership in a corporation and represents a claim on part of the corporation's assets and earnings.

Investment: An investment is an asset or item that is purchased with the hope that it will generate income or appreciate in the future.

Candlestick: A candlestick is a chart that displays the high, low, opening and closing prices of a security for a specific period.

Open: Opening price of a security for a specific period.

High: High price of a security for a specific period.

Low: Low price of a security for a specific period.

Close: Closing price of a security for a specific period.

Moving average: A moving average (MA) is a widely used indicator in technical analysis that helps smooth out price action by filtering out the “noise” from random price fluctuations. It is a trend-following, or lagging, indicator because it is based on past prices.

Exponential moving average: An exponential moving average (EMA) is a type of moving average that is similar to a simple moving average, except that more weight is given to the latest data.

Moving average convergence divergence: Moving average convergence divergence (MACD) is a trend-following momentum indicator that shows the relationship between two moving averages of prices.

Relative Strength Index: Relative strength index (RSI) is a technical indicator used in the analysis of financial markets. It is intended to chart the current and historical strength or weakness of a stock or market based on the closing prices of a recent trading period.

1.6 Organization of the Study

This study has been organized into five chapters. They are Introduction, Review of Literature and Theoretical framework, Research Design and Methodology, Results and Discussions and Summary and Conclusions.

Chapter 1

The first chapter introduces the background of the study, statement of problem, objectives of the study, significance of the study, definition of the terms and organization of the study.

Chapter 2

It consists of two parts: literature review and theoretical framework. Literature review shows the readers that you have an in-depth grasp of your subject; and that you understand where your own research fits into and adds to an existing body of agreed knowledge. It includes discussions on the conceptual framework on technical analysis. It also reviews the major studies relating to technical analysis of several authors and researchers and several books and journals,

Chapter 3

This chapter explains the research methodology used to evaluate Moving Average Convergence Divergence and Relative Strength Index of selected stocks. It consists of research design, population and sample, source of data collection, tools used in the analysis and limitation of the study.

Chapter 4

This chapter fulfills the objective of the study by presenting data and analyzing them with the help of various tools as per methodology. It is concluded with the findings of the study.

Chapter 5

It states summary, conclusion and recommendation of the study based on the data presentation and its analysis using the tools used in the analysis.

Beside these chapters, References and Appendix are also included at the end of the study.

CHAPTER II

LITERATURE REVIEW

A considerable amount of literature has been published on technical analysis. There are a number of studies that conclude that technical analysis is not useful. Nevertheless, there is also strong evidence that simple forms of technical analysis do bring forecasting power. This section briefly discusses the most influential studies on this topic

2.1 Conceptual Framework

Theories of stock price Behavior

There are three theories concerning stock price behaviors. These theories explain fluctuation of share price in the stock market. These theories are:

- Efficient market theories
- Fundamental analysis theory
- Technical analysis theory

2.1.1 Efficient Market Theories

Efficient Market

An efficient market is one where, shares are always correctly priced and where it is not possible to out perform the market consistently. In other words security prices fully reflect available information in an efficient market.

In efficient market, the new information plays vital role of changing the price of stock. In such market the only price changes that would occur, are those, which result from new information. So, if efficient market it uses all available information to determine stock price, the efficient market reflected from the perfect competition market where all information is available without cost and rational investor with no taxes or transaction cost. The following are the basic requirement for a securities market to be efficient market is (Valla, 1983:309).

- Prices must be efficient so that new inventions and better products will cause a firm's securities price to rise and cause investors willing to supply capital to the firm (i.e., buy its stock).
- Information must be discussed freely and quickly across the nation, so all investors can react to new information.
- Transactions cost such as sales commissions on securities are ignored.
- Taxes are assumed to have no noticeable effect on investment policy.
- Every investor is allowed to borrow or lend at the same rate.
- Investors must be rational and able to recognize efficient assets so that they will want to invest money where it is needed most (i.e., in the assets with relatively high returns)

"In an efficient market, competition among many intelligent participants leads to a situation where at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already accrued and on events which, as of now, the market expects to take place in the future"(www.investorhome.com/emh.htm) In other words, in an efficient market, current stock price at any point in time is the actual price of the security will be good estimate of its intrinsic values

Efficient Market Hypothesis

Before starting to evaluate the literature on the profitability of technical analysis it is important to discuss the Efficient Market Hypothesis (EMH). The Efficient Market Hypothesis (EMH) plays a crucial role in the financial lexicon, with its use widespread in the study of the behavior of stock prices. The Efficient Market Hypothesis evolved in the 1960s from Eugene Fama's Ph.D. dissertation. The EMH assumes markets to be efficient which can be interpreted by Fama's (1970) textbook definition: 'A market in which prices always "fully reflect" available information is called efficient'. Another well-known academic, Jensen (1978), describes the concept of efficient markets in more detail: 'A market is efficient with respect to an information set if it is impossible to make economic profits by trading on the basis of information set'. Jensen goes on to split the EMH into three

forms of efficiency. The weak form efficiency claims that all past prices of a stock are reflected in today's stock price. This implies that only fundamental analysis can be used to identify stocks that are undervalued and overvalued. Therefore the only way for investors to spot profitable companies is by researching financial statements as opposed to technical analysis. The semi-strong form efficiency implies that all public information is incorporated into a securities current price. This means that neither fundamental nor technical analysis can be used to return abnormal profits. Finally the strong-form efficiency, the most extreme form of market efficiency, states that all information, whether it is public or private, is reflected in a securities price. This implies that not only technical analysis and fundamental analysis are useless, even insider information proves unprofitable.

The EMH theory, is generally concerned with whether prices at any point “fully reflect” all available information (Fama 1970). According to the theory, there are no excess profits to be made by trading on any information, since that information would have already been priced in (Jensen 1978). Thus rendering technical and fundamental analysis obsolete. The burgeoning of this theory could be attributed to Fama. However, Fama (1970) first developed it by reviewing previous empirical studies such as Samuelson’s influential paper, “Proof that properly anticipated prices fluctuate randomly”, in which he opined that it is not possible to exploit any information set to predict future price changes; and the statically concluded assessment, within the financial market, that successive price changes are independent. Fama (1970) after his review concluded there were extensive evidence in support of EMH and that contradictory evidence was sparse. Further to this, he also postulated the three (3) forms of efficient market, namely:

Weak form efficiency – in this market, all historical prices is incorporated in current prices. Hence technical analysis yields no predictability or profitability. Tests within this markets prior to the 1970s was mainly focused on evaluating whether historical prices could be utilized to predict future prices, however recent studies within the area have been focused on the predictive abilities of financial ratios and interest rates (Fama, 1991)

Semi Strong Efficiency – this is where all previously public information has been aptly incorporated in the stock prices. Fama noticed that in this market, price changes subsequent to new information were instant. As a result of this phenomenon, fundamental and technical analyses are useless within this market. According to Fama, the current stock market is reflective of this kind of market.

Strong Form efficiency – the basic premise of this market is that no investor has superior ability over the market, and thus it is improbable to beat the market in any way. The test is mainly concerned with whether all information privies to the public and private groups have been incorporated in the stock prices. Several studies within this market have focused on whether certain groups with information monopoly can utilize it to their advantage to gain excess returns (Elton et al, 2007). According to Fama, the stance of this theory rocks “*the reason d’être of mutual funds, portfolio managers, equity analysts as well*

According to the weak form of efficient- market hypothesis and the random walk theory:

- The current price of a stock is reflective of historic data. Thus it is futile to study historic data since its effects are already embedded in the current price of a stock at any point time.
- The distribution of a stock is the same and independent of any information.

Based on this, we formulated this hypothesis under the premise that if the weak form of market – efficiency and the random walk theory is right then the returns generated by the MACD should be the same as that generated from the passive strategy (unconditional returns i.e. daily returns of our portfolio). However if the returns generated are different it then suggest that MACD is significant as it can predict price changes i.e. it captures scenarios/trends - an assertion that rebuts the weak form of market – efficiency and the Random Walk theory. The Random Walk Hypothesis (RWH) is closely related to the EMH. Bachelier (1900) first described the RWH in his book *Théory de la Spéculation*, where he asserted that fluctuations in stock prices can be explained by a random walk model. Although

his work was not widely recognized the RWH became well known due to succeeding studies by various authors such as Alexander (1961) and Osborne (1959). The Random walk model is defined by:

$$x_t - x_{t-1} = \epsilon_t$$

The left side of the equation describes the variable generated by the random-walk process, where is a sequence of random and independent values for time T. The successive price changes between the two periods are independent and have a zero mean where the variance is proportional to the interval between the successive periods. This implies that the annual variance is 250 times the variance of the daily changes, assuming a year with 250 trading days.

During the last two decades the EMH and RWH have been heavily criticized finding little support among practitioners, who criticize the two relating theories for being inapplicable in practice. Soros (1994), a successful trader who became famous for his profitable investments during the 1992 Black Wednesday UK currency crisis, comments on the notion of efficient markets. This motivates investors to try and outperform the market by turning to fundamental or technical analysis, or a combination of both as proposed by Bettman (2009). These investment styles share the objective of outperforming the market but differ in their methods of selecting their investments.

A myriad of empirical research has been done into the concept of efficient markets with opponents suggesting that evidence exists of predictability in equity returns from past return series (Chopra, Lakonishok & Ritter 1992, Fama & French 1986). One of the most popular studies testing the notion of efficient markets is the Capital Asset Pricing Model (CAPM). This asset pricing model was first developed by Sharpe (1964), Lintner (1965) & Black (1974) and has been a standard equilibrium model in the modern day financial lexicon. The following formula summarizes the CAPM:

$$r_i = r_f + \beta(r_m - r_f)$$

Where is the expected rate of return, the risk free rate, the beta and the market return. The CAPM implies that the expected returns on stock prices are positively linearly correlated to the market risk. This market risk is referred to as beta and is

calculated by measuring the covariance of the asset and the market with the total variance of the market, where a high beta implies a high volatility compared to the market. Thus, according to the CAPM, the volatility is the main risk factor explaining the variations in stock price movements. The three-factor model, developed by Fama and French (1993), builds upon the CAPM and adds two additional explanatory factors. The first factor is the size factor which captures the fact that small cap stocks tend to outperform large cap stocks, also known as the Small Minus Low factor (SML). The second factor in this three factor model is the value factor that addresses the Price-to- Earnings anomaly. Companies with low Price-to-Earnings (value stocks) values tend to outperform companies with high Price-to-Earnings (growth stocks). This factor is known as the High Minus Low factor (HML). In summary the three-factor model can be described as:

$$r_i = r_f + \beta_1(r_m - r_f) + \beta_2(\text{SMB}) + \beta_3(\text{HML}) + \alpha$$

Once the factors SMB and HML are defined the corresponding coefficients or beta's, are estimated by means of regression. However the CAPM is based on a number of assumptions about the distribution of stock price returns and volatility. One assumption that could collide with the nature of this thesis is the fact that the CAPM assumes that stock price returns are normally distributed with the variance remaining constant over time. Lukac & Brorsen (1990) provide a comprehensive study into the return distributions of speculative markets and find that these markets are not normally distributed and have time-varying variance.

Using the conditional CAPM market premiums were found to be positive. However when unconditional betas were used the average market premium is negative and not statistically significant. Furthermore Morelli found that, when using the unconditional beta's, some individual years show a positive statistically significant risk premium. These individual years appear to correspond to periods of high volatility in stock market volatile which would implicate that the model has value during periods of relatively high volatility.

Other studies that find evidence against the notion of efficient markets include Lo and MacKinlay (1988), who publicized an empirical study rejecting the Random

Walk Hypothesis for weekly U.S. stock indexes and show that historical prices can be a predictor for future returns to some degree, a fact which all technical analysts take for granted. Supporting studies find that various economic variables such as inflation (Fama & Schwert, 1977) and the term structure (Campbell, 1987) are able to forecast stock returns due to the time-varying risk premiums. Economists like Shiller (2000) find that there is consistent short-run momentum in the distribution of stock prices, a fact assumed by the random walk theory to be impossible. Shiller describes the rise in the US stock markets during the late 1990s as the consequence of psychological contagion. These findings are in line with the findings provided by behavioral economists such as Kahneman & Tversky (1981), founders of the Prospect Theory.

2.1.2 Technical Analysis

Technical analysis is a study of market where the movement of price is represented in different types of charts such as bar chart, candlestick chart and line chart. These charts represent the price movement with the openings and the closings of price for each timeframe chosen. Market consists of three different types of source which is price, volume, trend and interest. Technical analysis was first introduced in the 1900's and it was developed by Charles Dow through the Dow Theory. From the Dow Theory, principles such as price trending, charting, support level and resistance levels were derived. Technical analysis is an analysis used to analyze and predict the future movement of assets or currency from the past which is supported by the technical analysis philosophies. There are three philosophies that are involved in technical analysis which are market action discounts everything, price moves in trends and history repeats itself.

The Basic Assumptions of Technical Analysis are:

1) Market Fluctuations Discount Everything Else

Technical analysts believe that changes in the price of a security and how well it trades in the market embody all available information about that security from everyone involved with it and therefore represents the fair value of that security.

Sudden changes in how a stock trades often precede major news about the company that issued the stock. Technical analysts don't concern themselves with the price-to-earnings ratio, shareholder equity, return on equity or other factors that fundamental analysts do.

2) Price Movements can often be Charted and Predicted

Technical analysts acknowledge that there are periods when prices move randomly, but there are also times when they move in an identifiable trend. Once a trend is identified, it is possible to make money from it, either by buying low and selling high during an upward trend (bull market) or by selling short during a downward trend (bear market). By adjusting the length of time the market is being analyzed, it is possible to spot both short- and long-term trends.

3) History Repeats Itself

People don't change their motivations overnight; therefore, traders will react the same way to conditions as they did in the past when those conditions repeat themselves. Because people react the same way, technical analysts can use the knowledge of how other traders reacted in the past to profit each time those conditions repeat them.

2.1.3 Fundamental Analysis Theory

Fundamental analysis, the first approach to security analysis, tries to identify the real or true value of financial assets. The real value of any kind of financial assets is the present value of the future cash flow to forecast the timing and size of these cash flows, and then converts them into their equivalent present value by using an appropriate discount rate. Once the real value is calculated, it is, thereby, compared with the current market price per share to identify whether the security is under-priced or over-priced. If

Current market price > Real value (price) - Overpriced or overvalued

Current market price < Real value (price) - Underpriced or undervalued

These unusual cases of mis-pricing will be corrected in the future. The price of an over-priced security declines to meet the real value and the under-priced security's

price increases to meet the real price. The person utilizing this technique is called a fundamentalist or a fundamental analyst.

Fundamental analysis requires following assumptions:

- A business has an intrinsic value.
- Intrinsic value can be determined by analyzing company-generated information
- Intrinsic value may go unrecognized by the market in the short term.
- The market will eventually recognize the intrinsic value in the long run.

Fundamental Analysis Concern estimates of the basic determinants of security values, such as future sales, expenses and earning for firms. This approach studies to analyze different action, firm's financial statement etc. for calculation of intrinsic value for firm's securities. The fundamental analyst or fundamentalist believes on fundamental facts to determine the intrinsic value of stock. "Fundamental analyst forecast, among other things future levels of the economy's gross domestic product, future sales and earnings for a number of industries and future sales and earnings for an even larger number of firms" .Especially economic industry and company statistic is the basis of fundamentalists. The principal decision variable ultimate take form of earning and value with a risk-return framework based upon earning power and the economic environment. "Fundamental analysts delve into company's earnings, their management, economic outlook, firm's competitor's market conditions and many other factors.

The objective of fundamental security analysis is to appraise the intrinsic value of a security. The actual economic worth of financial asset is the intrinsic value. "the fundamentalists maintain that any points of time every stock has an intrinsic value which should, in principle, be equal to the present value of the future stream of income from that stock discounted at an appropriate risk related rate of interest. Therefore, the actual price of security is determined by an appropriate interest rate of the future stream of income. Price changes as anticipation changes, which in turn change, because of new information. In other words, a new price of news is

releases securities intrinsic values will change and regarding to new information the securities market price will adjust.

Fundamental analysis uses earnings and dividend prospects of the firm, expectations of further interest rates, and risk evaluation of the firm to determine proper stock prices. "The value of common stock is simply the present value of all the future income which the owner of the share will receive. Ultimately, it represents an attempt to determine the present discounted value of all the payments of stockholder will receive from each share of stock. Therefore, fundamentalists estimate their intrinsic value by studying in details all matters that are relevant to the company. "The study would involve examining its sales, earnings, profit margins, dividends, management proficiency, industrial and business outlook, labor competence and factor that would have a bearing in its performance in the future."

Fundamental analysis usually starts with a study of earnings and an examination of company balance sheets. They supplement this analysis with future detailed economic analysis ordinarily including an evaluation of the equity of the firm's management. The firm's standing within its industry, and the prospects for the industry as a whole on the basis of such a study, fundamentalists project a company's future profits and earning capacity with reasonable accuracy what the price of a company's share ought to be. This estimated price is termed as intrinsic value. If the intrinsic value is higher than the market value, fundamentalist will acquire shares as this difference presents them with an opportunity to make a profit and on other hand if the intrinsic value is lower than the market value, the share is over price and is an indication to the fundamentalists to sell. Therefore the fundamentalists argue that key role of intrinsic value of share in any common stock market with compare to present market price and take appropriate decision of investment or sell the common stock.

Some investment organizations that employ financial analysis follow a sequential top-down forecasting approach with this approach the financial analysts are first involved in making forecasts for the economy then for industries, and finally for companies other investment organization begin with estimates of the prospects for and ultimately the economy. Such Bottom-up forecasting may unknowingly involve inconsistent

assumptions. Therefore, to reach investment decision fundamental analysis uses such different analytical tools.

2.2 Technical Analysis Versus Fundamental Analysis

Technical analysis is solely based on the study of historical price fluctuations. Practitioners of technical analysis study price charts for price patterns and use price data in different calculations to forecast future price movements (Turner, 2007). The technical analysis paradigm is thus that there is an inherent correlation between price and company that can be used to determine when to enter and exit the market.

Basis	Fundamental Analysis	Technical Analysis
Definition	Value calculated using various economic factors	Uses price movements and patterns on charts to predict future price movements
Data From	Economic reports, news events, industry statistics	Chart analysis
Asset Bought(Sold)	When price falls below (above) intrinsic value	When trader sees a price formation that has a high probability of moving into profit in the near future
Type of Trader	Usually longer term position traders	Generally swing traders and short term day traders
Time Horizon	Often holding for days, weeks, or even months	Can be long term, but most take positions for days, minutes, or even seconds

Concepts Utilized	Report expectations vs actual outcomes, current news events compared to historical events	Trendlines, support and resistance(supply & demand), dow theory, price patterns
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Mainly, there are two types of investment analysis, they are fundamental analysis and technical analysis. Some tend to use technical analysis combined with other strategies such as fundamental analysis. Others prefer using technical analysis alone, relying on the assumption that market circumstances are always reflected on stock trade values. Technical analysis has been widely applied in financial markets for decades. It examines how an investor may profit from the behaviour observed in financial markets.

2.3 Theoretical Framework

2.3.1 Early Studies

Studies on filter rules are most voluminous among early studies. Alexander (1961) first developed filter rules which generate trading signals when to buy or sell a security. The trading signals are based on percentage changes in prices from previous lows and highs, with one of the most popular filter rules being the RSI, Fama and Blume (1966) perform extensive tests on the filter rules introduced by Alexander and find that only three small filter rules (0.5 percent, 1 percent, 1.5 percent) generate excess returns compared to the buy-and-hold strategy, using 30 individual stocks in the Dow Jones Industrial Average over the period 1956–1962. Other indicators that were extensively researched are the moving average based trading systems. Van Horn and Parker (1967, 1968) conclude that a buy and hold strategy outperforms a simple moving average trading system using 30 NYSE securities during the period 1960 - 1966. James (1968) and Jensen & Benington (1970) come to the same conclusion dismissing the profitability of simple moving average based trading system. However numerous studies on foreign exchange markets and future markets find

excess returns for simple technical trading strategies. Smidt (1965) and Stevenson (1970) find that there is predictability of soybean and corn prices through technical trading systems. Sweeney (1986) studies ten foreign exchange rates using filter rules and finds three filters (0.5 percent, 1 percent and 2 percent) to generate positive risk-adjusted excess returns. These results on the profitability of technical indicators appear to show that technical indicators are more frequently used in commodity and foreign exchange markets than in stock markets in the period before the 1980s. This could be due to commodity and foreign exchange markets showing better trading patterns, such as clear trends, resulting from less efficiency in these markets. However these early studies possess several limitations in their study methods. First of all these early studies tend to either exclude tests of significance and therefore it might be premature to draw such conclusions. Furthermore early studies do not always use risk-adjusted return measurements as means of testing profitability. For example Leuthold (1972) reports an annual net return of 115.8 percent when testing a filter rule, which appears very appealing. However an investor also considers the risk he is involved with when pursuing the trading strategy, which Leuthold does not report in the study. Leuthold could have applied a CAPM regression in order to provide the beta of the trading strategy so that the investor knows what the risk of the trading strategy is compared to the benchmark. Finally early studies do not always consider data snooping biases. This gives rise to curve fitting, resulting in profits that are due to luck. This data snooping bias can be easily avoided by using a proper back test procedure. This back test procedure should test the indicators on one period and then validate the trading performance a different period.

2.3.2 Modern Studies

Modern studies commence with Lukac et al. (1988) and provide improved empirical analytics to overcome limitations of the earlier studies by using more rigorous tests and econometric methodologies. The fast growing computer power of the last two decades has enabled researchers to apply more advanced technologies necessary to improve the statistical analysis. This improvement in research has led to a number

of different types of studies that provide improvements to early studies. First there are the studies that use parameter optimization in order to provide optimized results for the indicators. These optimized results are then verified using out-of-sample datasets. This type of modern study is referred to by Park (2007) as standard studies. An example of such a standard study is Lukac et al's (1988) study which simulates 12 technical trading systems on commodity futures using optimization methods. Lukac et al. (1988) test the results using Jensen's alpha providing tests on significance, assuming that the CAPM holds. Lukac et al. (1988) test for normal identically distributed returns using the Kolmogorov-Smirnov test for normality and finds that normality is not rejected. This test of normality is of great importance as research has shown that many security prices are not normally distributed but in fact leptokurtic implying more observations near the mean and in the extreme tails than originally assumed by the normal distribution. The study finds that four indicators, including the dual moving average crossover indicator, prove profitable after testing for significance and deducting trading costs. Lukac et al. (1988) thus provide many useful implications in testing the profitability of technical indicators, alleviating data snooping problems using out-of sample datasets for means of verification and conducting parameter optimization.

A second type of modern study identified by Park (2007) is the Model-based bootstrap study. Possibly the most influential and most cited modern study is Brock et al. (1992), who were among the first to implement the bootstrap methodology on technical trading profitability. The bootstrap methodology is a resampling technique that allows for estimation of statistics. Bootstrap-based studies apply a bootstrap methodology to overcome problems linked to leptokurtic, auto correlated, conditionally heteroskedastic, and time varying returns. A second advantage of the bootstrap methodology is that this test can develop a joint test of significance for a set of indicators, avoiding issues of complex dependencies when dealing with indicators individually. Another interesting pioneering feature of this study is the introduction of a band to the indicators. This band is added to the default technical indicators showing significant improvements in the profitability. The band improves profitability by reducing the number of trades generated by the indicator.

Any ‘whiplash’ trades are omitted, which arise when the indicator generates too many trading signals in a short period of time. Whiplash trades mostly occur when a security price moves sideways instead of moving in clear trends. The indicator then falsely indicates that trends are forming and generates buy and sell signals accordingly.

A more recent trend in literature that has been targeting technical analysis is the focus on the transaction costs incurred by technical analysis, which are especially present in high frequency trading strategies, like intraday trading. Neely (2003) finds that when taking both transaction costs and trading hours into account there is no evidence of excess returns to the indicators derived using a generic program and an optimized linear forecasting model. Many studies that claimed to prove that technical analysis gave rise to excess returns are undermined by the fact that they do not sufficiently incorporate transaction costs. Examples of such studies include studies like Brock et al. (1992) and Bessembinder & Chan (1998). Furthermore recent literature shows that it is important to carefully consider the time frame used to backtest the indicators. Sullivan et al. (1999) utilize White’s Reality Check Bootstrap Methodology to evaluate simple technical indicators as in Brock et al. (1992), while quantifying the data snooping bias and adjusting for this effect. They find that the profitability of technical analysis has declined over time, which is confirmed by Bajgrowicz et al. (2008). This could imply that speculative markets have become more efficient since the 1980s. Therefore it would make little sense to include a long historical sample period when investigating simple technical indicators. Academics and investment professionals are more likely to be interested in recent period datasets than long data sample periods that start before the 1980s since this could give false expectations on technical indicators.

2.4 Review of Empirical Studies

Technical analysis dates back to the 1800s and is often considered to be the original form of investment analysis. Technical analysis remains popular among investors today, even though it does not enjoy the following it once had. The oldest form of

technical analysis comes from the Dow Theory (1922), often falsely attributed to Charles Dow, the founder of The Wall Street Journal. Most of what we know of the Dow Theory actually comes from Charles Dow's successor, William Peter Hamilton. The Dow Theory was developed during a series of *Wall Street Journal* editorials written by Hamilton in a period between 1902 and 1929. Hamilton used Charles Dow's theory of stock market movements as a ground stone for his methodology. A keystone of the theory is that financial markets are assumed to move in persistent 'bull' and 'bear' trends, hampered by short term deviations. These trends arise due to the human nature of investors. Investors exert irrational behavior, like herding, which reinforce past price movements and allow bull and bear trends to arise.

Technical analysis use is widespread, especially in speculative markets. Smidt (1965) studied the use of technical analysis among amateur traders in US commodity futures and finds that more than 50 percent of the survey's respondents use technical analysis either as sole indicator or as part of a bigger system. Billingsley and Chan (1996) find that nearly 60 percent of trading advisors in commodity markets rely heavily on technical trading systems. Fung and Hsieh (1997) elaborate on this finding, stating that the dominant strategy for commodity trading advisors is trend-following. Finally there is evidence that technical analysis is widely used in foreign exchange markets (Gehrig & Menkhoff, 2006; Menkhoff & Taylor, 2007; Neely & Weller, 2003; Taylor & Allen, 1992). Although it appears that technical analysis is widely used in speculative markets, academics are definitely not convinced that this trading strategy provides positive excess returns. This skepticism can be derived from the general acceptance of the EMH among these skeptics. This controversy has led to a spur in volume of academic literature on this topic. Empirical studies on technical analysis can be divided into early studies and modern studies. Early studies start from Donchian (1960) and run up to 1987. Donchian is one of the earliest authors known to study technical analysis and therefore Donchian is often known as the father of trend following. Other early studies are similar to Donchian (1960) in the sense that several limitations in the testing procedures exist. Modern studies (1988 – 2012) are assumed to commence with Lukac et al. (1988), providing a more comprehensive analysis and in doing so

overcoming many limitations found in the early studies. Some of the notable studies are mentioned below:

Brown and Jennings (1989) showed that technical analysis has value in a model in which prices are not fully revealing and traders have rational conjectures about the relation between prices and signals.

Shrestha (1991) conducted A Study On Stock Price Behavior in Nepal using random walk analysis or weekly efficient market hypothesis to determine whether stock market of Nepal is efficient in pricing shares or not. The conclusion drawn in the study was that the random walk theory is not a suitable description for the stock market price behavior in Nepal. Further Shrestha concluded the dependence in the series of price changes implies that the price changes in the future market will not be independent from the price changes on previous days.

Neftci (1991) showed that a few of the rules used in technical analysis generate well-defined techniques of forecasting, but even well-defined rules were shown to be useless in prediction if the economic time series is Gaussian. However, if the processes under consideration are non-linear, then the rules might capture some information. Tests showed that this may indeed be the case for the moving average rule.

Brock (1992) states that modern technical analysis probably originated in the work of Charles Dow near the turn of the century. They found that the use of moving averages was discussed by Gartley (1930). There are also studies that support technical trading rules (Treynor and Ferguson, 1985; Brock *et al.*, 1992). Most of the earlier studies examine simple trading rules such as the moving average rule and the trading range break rule.

Aryal (1995) on his study on the general behavior of stock market prices based on the efficient random walk model concluded that the assumption of the independence, as predicted by random walk model of security price behavior, has been refuted at least for the Nepalese context as the first approximation even in the rough way for early days of stock market operation. The study made it clear that the knowledge of past and now becomes useful in predicting the future movement of stock market prices.

The investor on the floor of stock exchange for securities can make higher expected profits in the future based on the historical price series. The dependence nature of price series produced by general market fluctuation statistically implied, today's price change is positively depending upon yesterday's price changed.

Antoniou, Ergul, Holmes and Priestley (1997) used "daily closing prices for 63 stocks traded on the Istanbul Stock Exchange (ISE) in period January 1988 to December 1993" in order to evaluate the efficiency of returns' forecast based on seemingly efficient past prices. They found out that technical analysis of past prices plays a significant role in such kind of predictions. Moreover the authors stressed that if this analysis is also accompanied by technical analysis on volume, it can aid the certain credibility to the positive results of these forecasts, especially in case of stocks which have a low level of trading volume.

Bhatta (1997) in his unpublished dissertation on "Dynamics of Stock Market in Nepal" using random walk hypothesis or weakly efficient market hypothesis tried to determine whether stock market of Nepal is efficient in pricing shares or not . The conclusion drawn in the study was that the random walk theory is not a suitable description for the stock market behavior in Nepal. Further Mr. Bhatt concluded the dependence in the series of the price changes implies that the price changes in the future market will not be independent from the price changes on previous days.

Bessembinder and Chan (1998) reported that the moving average rules are useful for forecasting index returns for a group of Asian stock markets.

Shrestha (1999) carried out a study on stock price behavior in Nepal by examining daily closing prices of 30 companies by using serial correlation and run tests found that successive price changes are dependent. He also concluded that the Nepalese stock market is not efficient in pricing shares even in its weak form.

Lo, Mamaysky and Wang (2000) examined the effectiveness of technical analysis on US stocks from 1962 to 1996 and finds that over the 31-year sample period, several technical indicators do provide incremental information and may have some practical value.

Fernández-Rodríguez, González-Martel and Sosvilla-Rivero (2000) apply an artificial neural network to the Madrid Stock Market and find that, in the absence of trading costs, the technical trading rule is always superior to a buy-and-hold strategy for both 'bear' market and 'stable' market episodes, but not in a 'bull' market. One criticism the researcher has is that beating the market in the absence of costs seems of little significance unless one is interested in finding a signal which will later be incorporated into a full system. Secondly, it is perhaps naive to work on the premise that 'bull' and 'bear' markets exist.

Paudel (2001) has also conducted the research on "A Study on Share Price Movements of Joint Venture Commercial Banks in Nepal". He concluded that the ordinary least square equation of book value per share and market value per share reveals that the independent variable (i.e. BVPS). It obviously implies that Nepal Stock Exchange operates in a weak form of hypothesis, indicating that the market price of sample companies' move randomly. In the words of Paudel, from the study it is revealed that the publicly available information does not fully support the share price movement. Another issue in this regard is the transparency of facts and figures reflected in the financial return. In this regard Paudel has rightly concluded that financial statement prepared by the most companies lacks transparency. Since the financial statement prepared by Nepalese commercial banks is yet to meet the international accounting standard.

Papadamou and Tsopoglou (2001) tested the performance of different technical indicators on daily spot exchange rates for USD/DM and USD/GBP for the period 3/1/1989 to 31/12/1996. They used three different indicators, MA, Momentum and MACD, to get out the appropriate buy and sell signals. All signals proved to be successful and reliable.

Sigdel (2002) conducted a research on "Technical Analysis on Common Stock of Listed Joint Venture Commercial Banks". The main objective of his research was to analyze the common stocks of five joint venture commercial banks through technical approach. The specific objectives were to analyze the investment behavior of investors, predict the movements of market index, examine the performance of individual securities and to recommend the timing of purchase or sell. The research

relied on both primary and secondary sources of data. This data are analyzed in various useful tabular formats, graphs, charts, moving average etc. On the basis of technical analysis and other tools, Sigdel concluded that investors have no idea about technical analysis approach to take investment decision, they also have less confidence in Nepalese stock market, weak relationship between the stock activity and the economic growth, analyzing the sales with technical tools, increase the chances of taking right actions at the right time but it largely depends on the skills or expertise of analyst and market index reflects markets trends and it takes all issues listed on the exchange on account.

Okunev and White (2003) tested the performance of momentum trading strategies in foreign exchange markets. They found that momentum strategies was profitable from 1970 through 1990's, which gave further evidence supplementing the previous studies in equity indices. They also found evidence that the strategy worked on currencies as well.

Manzur and Chew (2003) investigated the performance of the most established of trend followers, the moving average (single, dual, tripe), and the most frequently used counter-trend indicator, the relative strength index on basis of Singapore Stock Exchange (SES) data. The authors concluded that "single moving average produce the best results, followed by the dual moving average and the relative strength index using '50 crossover' method". This research can serve as the strong verification of use of technical indicators "in the timing of stock market entry and exists"

Pradhan and Upadhyaya (2004) on "The Efficient Market Hypothesis and the behavior of Share Price in Nepal" tried to highlight efficiency of market and behavior of share price. "The Nepalese stock market may not be termed as "weekly efficient" in pricing of shares. The surveys of the opinions of Nepalese financial executive indicate that the current market prices of shares are useful to make buy or sell decision, to predict future average returns and to predict future prices. The main factors affecting share prices as perceived by them are dividends, retained earnings, bonus shares, and night issues. The share price has been found more volatile than expected dividends. The study also revealed that Nepalese investors are not indifferent towards making or non-makings of information public. Among others, the company information, lack of

profitability of the company market operation system and government policy regarding investment is appeared to be major causes of deficiency in Nepalese stock market. Information on favorable future prospect of the company would increase market price of share and shareholders in high tax brackets do not prefer retained earnings instead of dividends"

Bhattarai on "New Business Age", September 2004, in title "History repeats" has mentioned that; History tends to repeat itself. The securities analysis, who analyze securities presenting the past data on the charts, graphs, figures etc. and forecast whether the price will fall or rise, agree to this theory and say the share prices once turned bearish definitely turn to be bullish sometime in the future." He further discussed about demand and supply about stock market and he continued that history may repeats own self in future market because of many reasons. He argue that "These analysis assume that the market price is a function of demand and supply of stocks and the commanding forces behind the demand might be various factors like political, economic, financial, national, international events as well as the information disclosed by the companies. The various factors make the people either invest in the securities or disinvest. These decisions eventually result in the demand and supply of the stocks to go up or down.

Lamichhane (2005) on his study on "Technical Analysis of Common Stock Listed Companies in Nepal" analyzing through technical tools like line chart, bar chart, Dow Theory, moving average concluded that the Nepalese stock market is in growing trend, market is totally dominated by banking sector and the NEPSE index pushed by the increase in the price of banks shares. He also claimed that the Nepali stock market is primarily guided by whims and not by new information that is a sign of market inefficiency.

Mainalee (2006) on his study on "Technical Analysis of Common Stock of Joint Venture Bank" concluded that investors in the stock exchange are not well aware about their investment decision. He also concluded that in all cases it is not possible to forecast the future price movements through technical analysis. Mainalee has focused to study is to analyze, state the problems and prospects of technical analysis of

common stock in Nepal. After study and analysis of data and information by using different tools, Mainalee's major finding is that investors in the stock exchange are not well aware about their investment decision and in all cases it is not possible to forecast the future price movements through technical analysis.

Park and Irwin (2007) did a review of research papers that try to analyze potential profits generated by technical analysis. They find that modern studies indicate that technical analysis consistently generates profitable returns in a variety of speculative markets (e.g., the stock market, foreign exchange market, et cetera).

Vassilou, Eriotis and Papathanasiou (2008) examined the popular dual moving averages rules (1-9, 1-15, 1-30, 1-90, and 1-130) on the 20 stocks (basis for the FTSE/ASE-20 Index) of Athens Stock Exchange with the largest capitalization during eleven-year period. The results showed abnormal returns of dual moving average strategy in comparison with buy-hold strategy. This helped the readers to have knowledge about momentum.

Karki (2008) on his study of "Trend Analysis of Share Price in NEPSE's" concluded that most of the theories and assumptions of technical analysis matches with the Nepal's stock market. Although mostly fundamental factors influence the share price in NEPSE but one cannot also ignore the past price and traded volume of the company. Investors were found that they were eager to learn and apply the technical tools. He also concluded on his study that three oscillators (i.e. MACD, ROC and RSI) are very helpful tools of technical analysis, which help in depicting the future market.

Subedi (2009) on her study of "Application of Technical Analysis Tools in Nepalese Stock Market" tested the trends and patterns of share price movement. Out of the listed companies, Standard Chartered Bank, Himalayan Bank, NABIL Bank, Nepal Investments Bank, Nepal SBI Bank, Everest Bank and Nepal Industrial and Commercial Bank are selected as sample of the study. It was concluded that Nepalese investors can use these tools to predict the future movement of the market. Most of the theory and assumptions of technical analysis matches with the Nepal's Stock

market procedures. Mostly fundamental factors influence the share price in NEPSE but one can't also ignore the past price and traded volume of the company.

Dhungana (2010) on his study "Trend Analysis of Nepalese Stock Market" analyzed the trends in NEPSE using technical tools and predicted the trends and patterns of NEPSE movement and explored the potentiality of technical analysis in Nepalese stock market. He further examined the efficiency of Nepal's stock market through qualitative test. Out of population these 5 major sectors are selected as sample of the study i.e Banking, Development bank, Finance companies, Insurance companies and Others. The researcher can conclude that most of the time technical tools gives true result. Despite of technical correction in the market from time to time technical tools are able to interpret the market trends most of the time.

Dongol (2010) examined random walk behaviour on daily market returns of the Nepal Stock Exchange (NEPSE) using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests for the period between July 14, 2000 and January 14, 2010. The study finds that unit root do not exist, and the returns series are stationary. This provides the evidence that the Nepalese stock market does not show characteristics of random walk and thus, it is not efficient in the weak form.

Tiwari (2011) on his study "Technical Analysis On Common Stock Of Commercial Bank In Nepal" analyzed "technically" the market price of common stocks of selected four Commercial Banks listed in the Nepal Stock Exchange (NEPSE) Ltd. and its significance in the context of Nepal. The researcher examined the common stocks price movements of four selected Commercial Banks Nabil Bank Ltd, Nepal Investment Bank Ltd, Standard Chartered Bank Ltd and Himalayan Bank Ltd. The researcher analyzed price movement of stocks of four Commercial Banks through Technical Analysis consisting of Trend line, Japanese Candlesticks Chart, Volume Bar Chart and 5 days Moving Average and concluded that majority of investors (56.52 percent) viewed that demand and supply pressure of shares in secondary market determines market price of share, majority of investors are not sure about usefulness of trends and patterns of predict market price of share and most on

investors replied that it is necessary to extend stock exchange market in all development regions.

Chitra (2011) in her research found that technical analysis is a study of the stock market relating to factors affecting the supply and demand of stocks and also helps in understanding the intrinsic value of shares and to know whether the shares are undervalued or overvalued. The stock market indicators would help the investor to identify major market turning points.

Venkatesh & Tyagi (2011) in their research paper found that the results of a questionnaire survey in September to November 2010 on the use of Technical analysis by brokers/fund managers in Indian stock market to form their forecasts of share price movements. The findings of the research reveal that more than 85 percent of the respondents rely upon both Fundamental and Technical analysis for predicting future price movements at different time horizons.

Bista (2016) examine stock return in Npse using Fama and French Three Factor Model. The results indicated that using the market portfolio alone R squared values increased when regressing on the three risk factors together, intercepts to “0” indicating the strong power of the risk factors.

Anitha and Padmaja (2017) did the study which is focused in comparing the effectiveness through analyzing the profitability of the most popular technical indicators namely, Moving Average Convergence and Divergence, Relative Strength Index, Stochastic Oscillator, Average Directional Index and Commodity Channel Index. For this purpose, the prices of State Bank of India from the Banking sector of National Stock Exchange (NSE), India has been analyzed for the period of ten years from 1.1.2007 to 31.12.2016.

Berry (2017) did the paper whose purpose is to make a study on the technical analysis on the randomly selected stocks of eight companies from NSE & BSE. On the basis of analysis of secondary data collected from website one can develop buy & sell strategy. Exponential Moving Average, MACD, Relative Strength Index & Rate of Change are the tools used for analysis. On the basis of analysis one can buy stock of Pharma Company, Bank and FMCG but have to take short or hold position in scrip of

reality sector. It was concluded that out of the four methods used Exponential Moving Average & Moving Average Convergence & Divergence is most accurate method and give clear results but sometime create confusion due to minor difference in MACD Line, Signal Line and Long & Short Exponential Moving Average. Investor can take buy & sell decisions correctly with the help of technical analysis. Therefore investor can rely on techniques of technical analysis before making investment and should not make any investment decisions blindly

Pushpa, Sumithra & Hegde (2017) did a paper which focused on price movement of a security and uses it's data to predict its future price movements. The paper aims at technical analysis of select companies under Nifty 50 based on different sectors for a period from January 2011 to December 2016. The tools used for analysis include moving averages, RSI, Bollinger bands and MACD. The paper concludes that most of the stocks analyzed revealed technically strong position.

Ivanovski, Ivanovska & Narasanov (2017) tested accuracy of several technical analysis techniques: MACD (Moving-Average Convergence/Divergence), RSI (Relative Strength Index), Stochastic Oscillator and ADX (Average Directional Index) on the three most liquid stocks quoted at MSE and included in MBI10 index. Technical analysis for MPT, ALK and KMB stocks was performed and recommendations were issued in June 2010, based on monthly and weekly data for the stocks' price movements during six years period from 2005 to 2010, as well as on their daily price movements from 2009 to 2010. They find that technical analysis is reliable tool for MSE stocks forecasting. Technical analysis predictions for three MSE stocks were confirmed by actual stock price movements within one year period (June 2010-June 2011). They did not find any notable differences in accuracy of use of technical analysis between stocks at MSE as well as between different technical analysis techniques.

Ahmar (2017) has developed a new technical analysis tool e.g. Sutte Indicator. Sutte Indicator was developed by considering the opening and the closing price, the highest price as well as the lowest price on the stock. Core indicators used in Sutte Indicator is the modified Moving Average indicator by considering the stock price at the time

of opening, closing, highest and lowest. Sutte Indicator could form two graphs that show when stocks are looking for the suitable stock to buy and sell. This figure is intended to provide a signal to investors to get maximum profit with minimal losses.

2.5 Matrix of Related Studies

Table 2.5 includes the authors and year it was published. It also represents their country and their methodology performed during their study and their major findings of the study.

Table 2.5 Matrix of Review of Related Studies

Authors and Year	Country and Methodology	Major Findings
DimitriosVassilou, NykolaosEriotis, Spyros Papathanasiou:2008	Greece: Examined the popular dual moving averages rules	The results showed abnormal returns of dual moving average strategy in comparison with buy-hold strategy
Park and Irwin: 2007	USA: Review of research papers that try to analyze potential profits generated by technical analysis	Found that modern studies indicate that technical analysis consistently generate profitable returns in a variety of speculative markets

Authors and Year	Country and Methodology	Major Findings
Meher Manzur, Boat-Kiat Chew:2003	Singapore: Investigated the performance of the moving average (single, dual, triple), and the most frequently used counter-trend indicator, the relative strength index	Found that single moving average produce the best results, followed by the dual moving average and the relative strength index
Papadamou and Tsopoglou:2001	Greece: Tested the performance of different technical indicators on daily spot exchange rates by using three different indicators, MA, Momentum and MACD	The result showed all signals proved to be successful and reliable
Lo, Mamaysky and Wang:2000	USA: Examines the effectiveness of technical analysis on US stocks	Results showed that technical indicators do provide incremental information and may have some practical value
Fernández-Rodríguez, González-Martel and Sosvilla-Rivero:2000	Spain: Tested artificial neural network	Found the technical trading rule is always superior to a buy and-hold strategy for both ‘bear’ market and ‘stable’

Authors and Year	Country and Methodology	Major Findings
Bessembinder and Chan:1998	USA: Tested the moving average rules	Found that the moving average rules are useful for forecasting index returns for a group of Asian stock markets.
A. Antoniou, N. Ergul, P. Holmes and R. Priestley:1997	Turkey: Tested daily closing prices in order to evaluate the efficiency of returns'	Found out that technical analysis of past prices plays a significant role in such kind of predictions
Neftci:1991	Turkey: Tested the rules used in technical analysis	Findings showed that even well-defined rules were shown to be useless in prediction if the economic time series is Gaussian
Brown and Jennings:1989	USA: Tested technical analysis	The result showed traders have rational conjectures about the relation between prices and signals.

2.6 Concluding Remarks

Many researches on technical analysis have been done by researchers through different methods worldwide. Research related Asian countries and developing countries have been done in the field of technical analysis. Many researchers have studied stock market behaviour of Nepal through fundamental and efficient market theory, but only few researchers have studied about technical analysis, tools in stock market. Thus, the current study is a supplement to overcome the different of past works and fill up the research gap, the investigator claims that following points will be justifiable to the study conducted on Application of Technical Analysis to Investment Decisions in Nepal.

Some traders concluded that they don't find technical analysis accurate. Whether technical analysis actually works is a matter of controversy. Methods vary greatly, and different technical analysts can sometimes make contradictory predictions from the same data. Many investors claim that they experience positive returns, but academic appraisals often find that it has little predictive power. Of 95 modern studies, 56 concluded that technical analysis had positive results, although data-snooping bias and other problems make the analysis difficult.

In this report, a small subset of technical indicators' performances with regards to a subset of stock sectors was investigated. Due to time constraints and the fact that hundreds of technical indicators exist, an in-depth investigation of all indicators was not realistic.

Previous research within the area of technical indicators is numerous worldwide, focus has however mainly been placed on technical indicators in order to try and turn a profit.. Few studies has been done in listed company of Nepal Stock Exchange compared to numerous studies carried out on different parts of the work, so there is research gap and hence this study tries to fill gap through testing technical analysis on selected stocks.

CHAPTER III

RESEARCH METHODOLOGY

. This chapter consists of the research design, population, sampling procedure and sources and analysis of data. The first part includes research design and plan of the study. The second part includes nature and sources of data. The third part includes population and sample. The fourth part includes method used in this study.

3.1 Research Design

Descriptive and analytical research design has been used to make the analysis more conclusive. The main objective of the study is to analyze, examine and interpret the Moving Average Convergence Divergence and Relative Strength Index of the selected stocks. This study is based on the analysis of past five year's performance of these banks and companies.

3.2 Sources of Data

The study is based mostly on secondary data. Various journals, books, magazines, newspaper, articles etc. are the sources of secondary data. The necessary data for the companies based on listed companies of Nepal Stock Exchange are obtained from Nepal stock Exchange, Security Board of Nepal and Nepal Rastra Bank. Mostly the listed stock is obtained from the fiscal year 2015/16 AD to 2017/18 A.D.

3.3 Population and Sample of the Study

This research work has been designed to study the moving average convergence divergence and relative strength index of selected stocks. Since the study is about the moving average convergence divergence and relative strength index of listed companies of NEPSE, the population of this study comprises closing prices at the end of each month from 2015 to 2018 listed in Nepal Stock Exchange. Among the total number of companies listed in NEPSE, no of sample varies from year 2016 to 2018 A.D as per availability of data.

3.4 Data Collection Procedure

. The researcher studied high and low of Nabil Bank Limited, Soaltee Hotel Ltd and Butwal Power Company Limited share as well as consulted different people. After then

the researcher consulted different books & past year's report writing which made it easy to write this report. The researcher took not only the actual data from Nabil Bank, Soaltee Hotel Ltd and Butwal Power Company about the moving average convergence divergence and relative strength index but analyzed the data also.

3.5 Criteria for selecting sample companies

- 1) Sectoral representation
 - i) Banking Service – Nabil Bank Limited
 - ii) Energy industry – Butwal Power Company Limited
 - iii) Hotel – Soaltee Hotel Limited

3.6 Tools And Techniques

In addition the data are presented in appropriate forms of tables and graphs. Following tools and techniques are used:

- Exponential Moving Average
- Relative Strength Index
- Moving Average Convergence Divergence

EXPONENTIAL MOVING AVERAGE (EMA) :

Exponential moving average is the moving average that is formed by applying weight to the recent price changes. This reduces the time lag. This makes the EMA to respond faster to the price changes than SMA. There are three steps to calculating an exponential moving average. First, calculate the simple moving average. An EMA has to start somewhere so a simple moving average is used as the previous period's EMA in the first calculation. Second, calculate the weighting multiplier. Third, calculate the exponential moving average, the formula for calculating EMA is:

$$X = (K \times (C - PEMA)) + PEMA$$

Where,

X = current EMA

C = current price

PEMA = previous period's EMA*

K = smoothing constant

(* the first simple moving average itself is used for the first period's calculation)

The smoothing constant applies the appropriate weighting to the most recent price relative to the previous exponential moving average. The formula for the smoothing constant is:

$$K = 2 / (1 + N)$$

Where,

N = number of periods for EMA

RELATIVE STRENGTH INDEX(RSI)

RSI is an oscillator used to identify the inherent technical strength and weakness of a particular scrip or market. RSI can be calculated for scrip by adopting the following formula.

$$RSI = 100 - \frac{100}{1 + RS}$$
$$RS = \frac{\text{Average Gain Per Day}}{\text{Average Loss Per Day}}$$

The RSI can be calculated for any number of days depending on the wish of the technical analyst and the time frame of trading adopted in a particular stock market. RSI is calculated for 5, 7, 9 and 14 days. If the period taken for calculation is more, the possibility of getting wrong signals is reduced.

The broad rule is, if the RSI crosses seventy there may be downturn and it is time to sell. If the RSI falls below thirty it is time to pick up the script. If the RSI is rising in the overbought zone, it would indicate the downfall of the price. If RSI falls in the

overbought zone, it gives a clear signal of sell. This condition occurs after a sharp rise in price during a period of heavy buying. When the RSI is in the oversold region, it generates the buy signal. The term oversold is used to describe a security or market that has declined to an unreasonably low level.

MOVING AVERAGE CONVERGENCE DIVERGENCE (MACD)

The Moving Average Convergence Divergence (MACD) is shown in this plot below the prices. It consists of two lines, the MACD line and the signal line. It can be seen the trend in the prices when the MACD line is above or below the signal line and the changes when both lines cross. Here it is shown the typical configuration 12,26,9 for short, long and signal windows. Developed by Gerald Apple in late 1970s, MACD turns two trend following moving averages into a momentum oscillator by deducting the longer-period moving average from the shorter-period one. Specially, the MACD is commonly calculated as follows:

MACD Line = 12-day EMA – 26-day EMA

Signal Line = 9-day EMA of MACD Line

Histogram = MACD Line – Signal Line

The MACD line is the 12-day exponential moving average (EMA) less the 26-day EMA. Typically closing prices are used. Exponential moving averages are similar to simple moving averages, except that more weight is given to the latest data. As a result, this type of moving average reacts faster to recent price changes than a simple moving average. The signal line is a nine-day EMA of the MACD line and is plotted along with the MACD line on a chart. It is the interaction between these two lines—crossovers and divergences—that traders look for.

Lastly, the MACD histogram measures the difference between the MACD line and the signal line. It is positive when the MACD line is above the signal line and negative when the signal line is above the MACD line. The 12-, 26- and nine-

day settings are the typical settings used for the MACD. However, it can be adjusted in the lengths to fit own trading style. Furthermore, MACD can be used in daily, weekly or monthly charts.

Bullish Trend:

If MACD is positive and rising, then the 12 day moving average is increasing at a faster rate than the 26 day moving average and the gap between the two is widening. Positive momentum is gathering pace. This trend is considered bullish - a signal that the price is going up.

Bullish Signals:

1) Positive Divergence

Positive divergence occurs when MACD advances upwards at a time when the price is still in a down trend. MACD forms a sequence of higher lows (each low higher than the previous day or period). Positive Divergence is the least common of the 3 bullish signals but it is the most reliable and leads to the greatest price moves.

2) Bullish Moving Average Crossover

This occurs when MACD moves above its 9 day EMA or trigger line. These are the weakest of the 3 bullish signals, are very common and are not very reliable as market signals in their own right. They should never be used in isolation.

3) Bullish Centreline Crossover

This occurs when MAC moves upwards from a negative value and crosses the 0 axis to a positive value. Of the 3 bullish signals, a centreline crossover is the second most common. It is generally regarded as a confirmation signal.

Bearish Trend:

If MACD is negative and decreasing, then the 12 day moving average is falling at a faster rate than the 26 day average and the gap between the two is expanding. Downward momentum is accelerating. This trend is considered bearish - a signal that the price is falling.

Bearish Signals:

1) Negative Divergence

Negative divergence occurs when the price advances or moves sideways and MACD declines. The divergence can either take the form of a lower high or a straight decline. Although this is the least common of the 3 bearish signals, it is the most significant and reliable one.

2) Bearish Moving Average Crossover

This is the most common signal. It occurs when MACD falls below its 9-day EMA signal level. Be warned! These signals are so common that they often produce false signals. The moving average crossover should be read in conjunction with other signals to avoid expensive mistakes.

3) Bearish Centreline Crossover

This occurs when MACD moves below the zero line and into negative territory. It is a clear indication that the momentum has shifted from positive to negative and from a bullish to a bearish trend. This signal can be a confirmation on its own or may be used as a confirmation together with negative divergence or a bearish moving average crossover. Either way, once MACD is negative, it means the trend has become bearish, even if it is short-lived.

3.7 Limitations of the Study

Every study has its own limitations. This study is also not an exception. The following are the limitations of the study:

- 1) This study is based on the few year's analyzed data and report from 2016 A.D to 2018 A.D.
- 2) The study has been based on the secondary data only.
- 3) The study has focused only on moving average convergence divergence and relative strength index of technical analysis.
- 4) The study has been performed within short period of time.

CHAPTER IV
PRESENTATION AND ANALYSIS OF DATA

This chapter consists of examining, categorizing, tabulating or otherwise re-combining the evidence, to address the initial propositions of a study. Data analysis starts with collection of data followed by sorting and processing it. Presenting the data includes the pictorial representation of the data by using graphs, charts, maps and other methods.

4.1 Stock Price of Soaltee Hotel Limited

Table 4.1.1 indicates the high, low, opening and closing price of Soaltee Hotel Limited from period 2016 to 2018.

Table 4.1.1 Stock price of Soaltee Hotel Limited

Months	Open	High	Low	Close
Mar.16	332	344	335	335
Apr.16	355	354	350	353
May.16	345	351	345	348
Jun.16	380	386	373	381
Jul.16	437	445	413	415
Aug.16	408	408	392	400
Sept.16	411	417	411	416
Oct.16	430	438	430	433
Nov.16	355	371	348	360
Dec.16	310	316	309	316
Jan.17	256	287	256	287
Feb.17	265	265	254	261
Mar.17	340	345	330	338
Apr.17	357	357	350	350
May.17	360	365	356	365
Jun.17	355	361	346	359
Jul.17	373	400	370	389
Aug.17	370	368	364	365
Sept.17	358	358	358	358
Oct.17	351	351	350	350
Nov.17	286	290	280	282
Dec.17	265	270	265	270
Jan.18	270	275	270	275
Feb.18	253	253	252	253

Note: From Merolagani.com

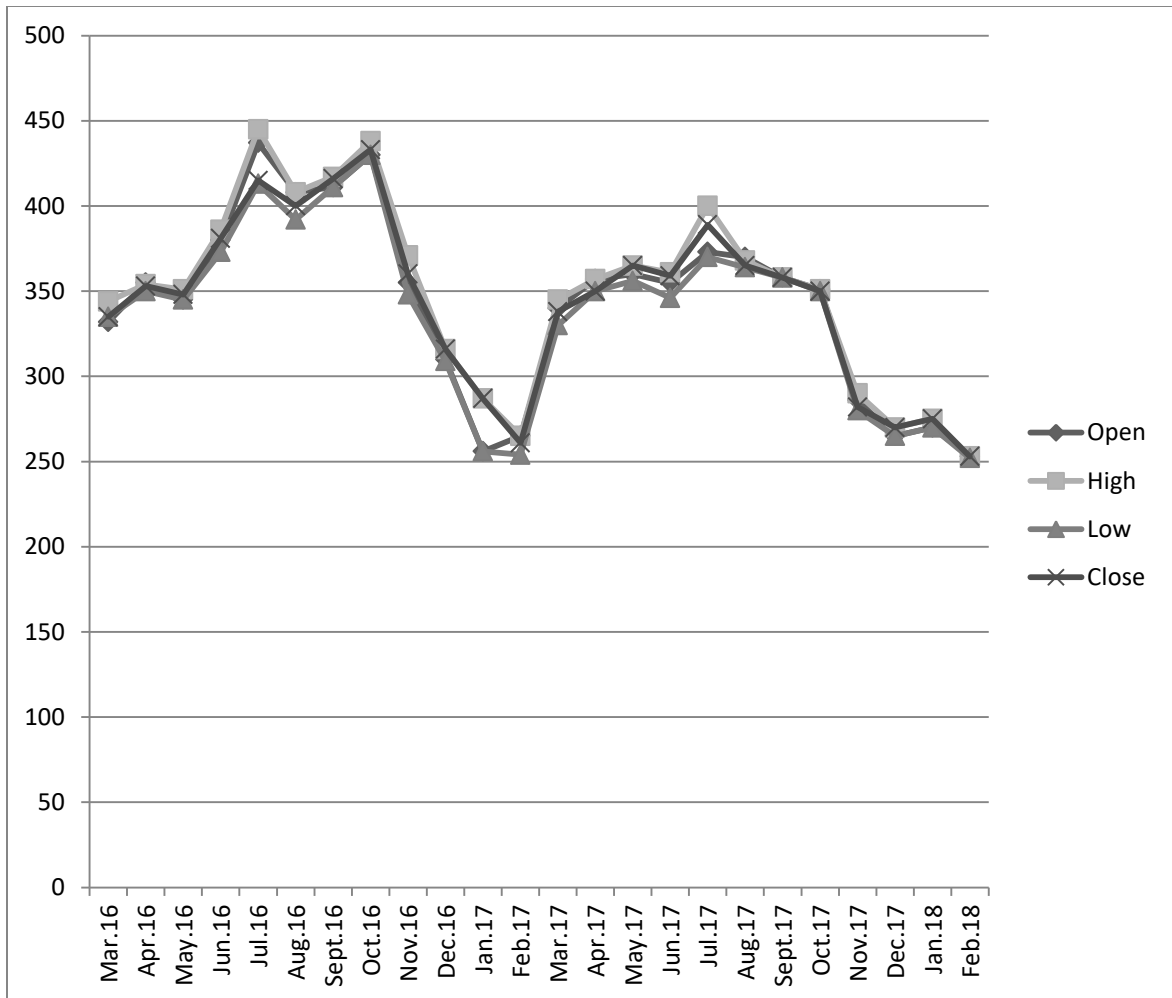


Fig 4.1.1 Line chart of Soaltee Hotel Limited

In above figure, the Open price is Rs. 332 (in March 2016) and it decreases to Rs.253 in February-2018 with a slight variation in prices. The highest open price is 437 and lowest price is Rs.253.

Secondly it can be considered the High price which is Rs. 344 (in March 2016) and it decreases to Rs.253 in February-2018 with a slight variation in prices. The highest in high price is Rs.445 and lowest price is Rs.253.

Thirdly it can be considered the Low price which is Rs. 335 (in March 2016) and it decreases to Rs.252 in February-2018 with a slight variation in prices. The highest open price in low prices is Rs.430 and lowest price is Rs.252

Fourthly it can be considered the Close price which is Rs.335 (in March 2016) and it decreases to Rs.253 in February-2018 with slight increment or decrement in prices. The highest open in close prices is Rs.433 and low price is Rs.253.

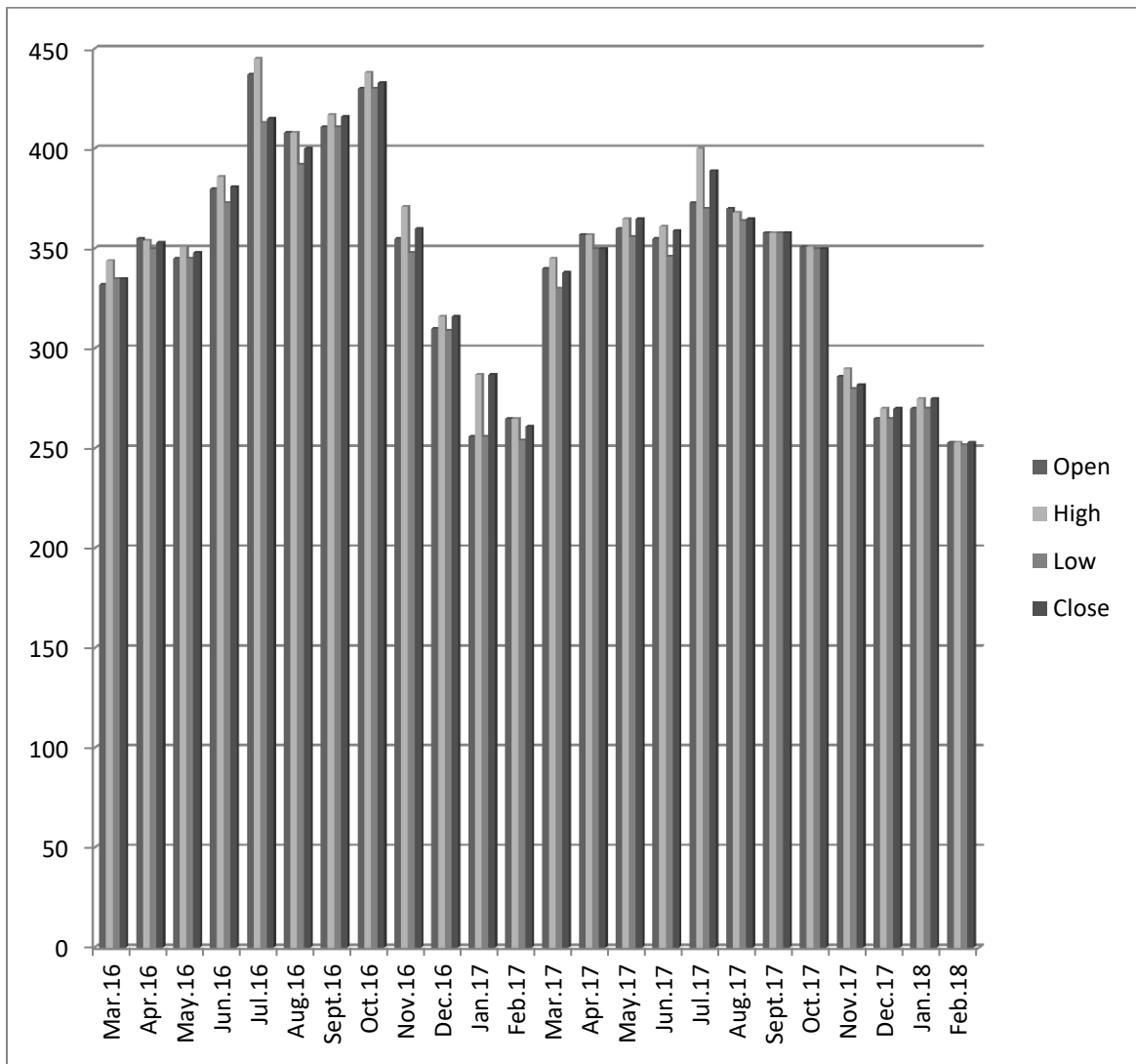


Fig 4.1.2 Column chart of Soaltee Hotel Limited

From the column chart of SHL it was found in Jan. 2017, the share price of SHL was Rs.287 and it has decreased in Feb.2017 to Rs 261 which is low from the previous one. It also goes up further in March.2017 to Rs.338 which is high from the previous one. The

highest closing price in 2016 is Rs 433 whereas it is Rs 389 in 2017. It shows decreasing trend in following year. The highest opening price in 2016 is Rs 437 whereas it is Rs 373 in next year. The buyers will be eager to buy stocks whereas sellers will be inactive and will be hoping for the increase in price for profit.

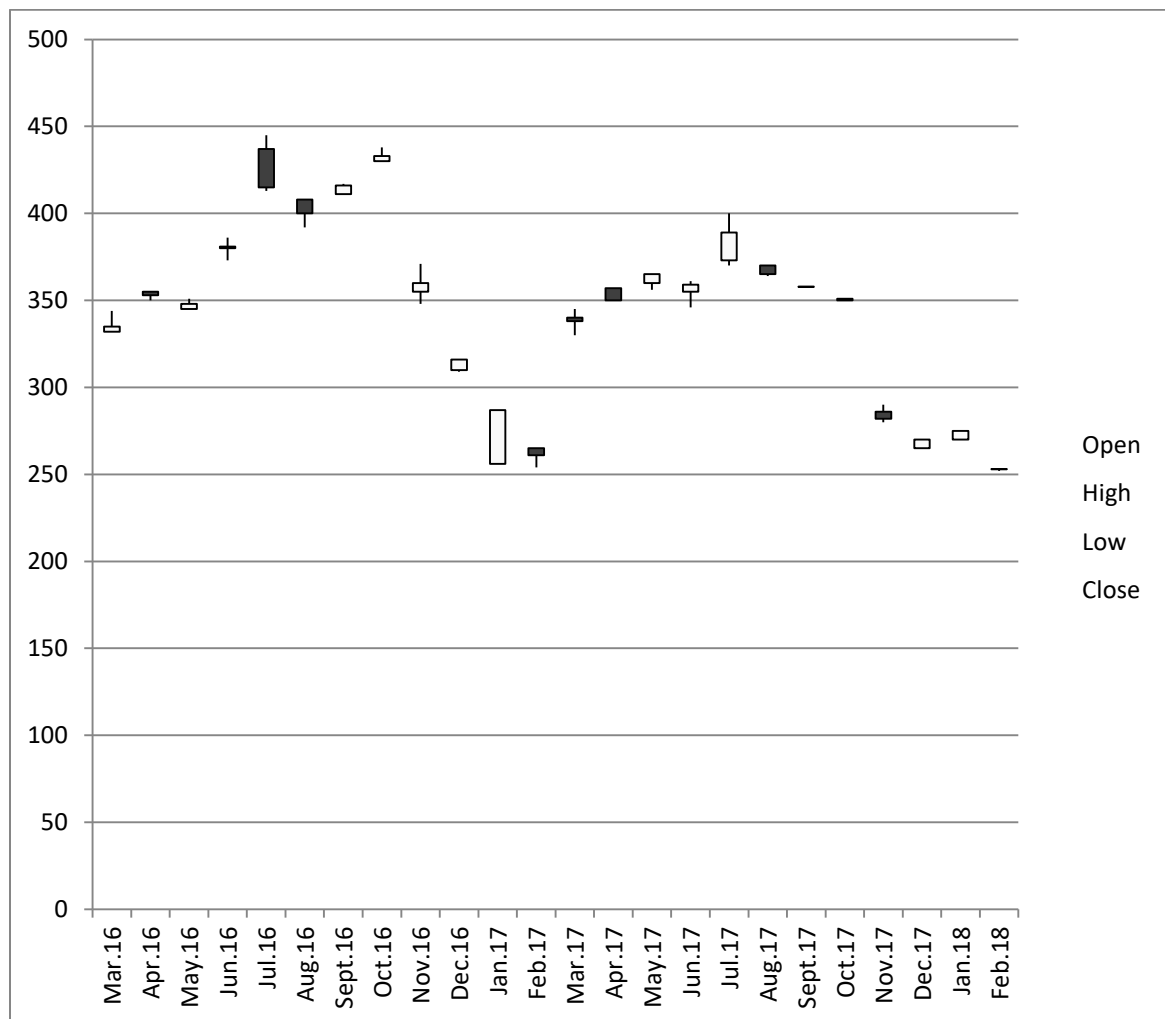


Fig 4.1.3 Candlestick of Soaltee Hotel Limited

From the stock chart of SHL it was figured out higher high and higher low pattern. Here the share prices of SHL are rising and decreasing quickly. In Nov. 2016 the share price was Rs.360 and it goes in downward direction and after some period it is found to be at the same level in Jun.2017 of Rs.359 and again after Nov. 2017, it has a decreasing trend. This creates a head and shoulder pattern. When the share prices are at the peak the

investors are ready to sell. Because after reaching the peak, the prices are expected to decline and hence the investors make a sell signal.

4.2 Stock Price of Nabil Bank Limited

Table 4.2.1 indicates the high, low, opening and closing price of Nabil Bank Limited from period 2016 to 2018.

Table 4.2.1 Stock price of Nabil Bank Limited

Months	Open	High	Low	Close
Mar.16	2111	2200	2111	2120
Apr.16	2232	2260	2236	2237
May.16	2271	2275	2251	2268
Jun.16	2450	2509	2450	2471
Jul.16	2466	2500	2435	2465
Aug.16	2340	2340	2274	2325
Sept.16	1770	1770	1757	1764
Oct.16	1730	1755	1730	1755
Nov.16	1525	1640	1450	1635
Dec.16	1480	1485	1450	1475
Jan.17	1425	1425	1350	1365
Feb.17	1400	1400	1377	1395
Mar.17	1500	1581	1529	1575
Apr.17	1580	1581	1557	1580
May.17	1550	1553	1535	1538
Jun.17	1500	1500	1485	1499
Jul.17	1625	1640	1625	1627
Aug.17	1775	1799	1758	1766
Sept.17	1265	1265	1251	1263
Oct.17	1240	1240	1225	1230
Nov.17	1165	1180	1165	1178
Dec.17	1125	1129	1085	1090
Jan.18	1045	1055	1044	1048
Feb.18	1060	1067	1055	1060

Note: From Merolagani.com

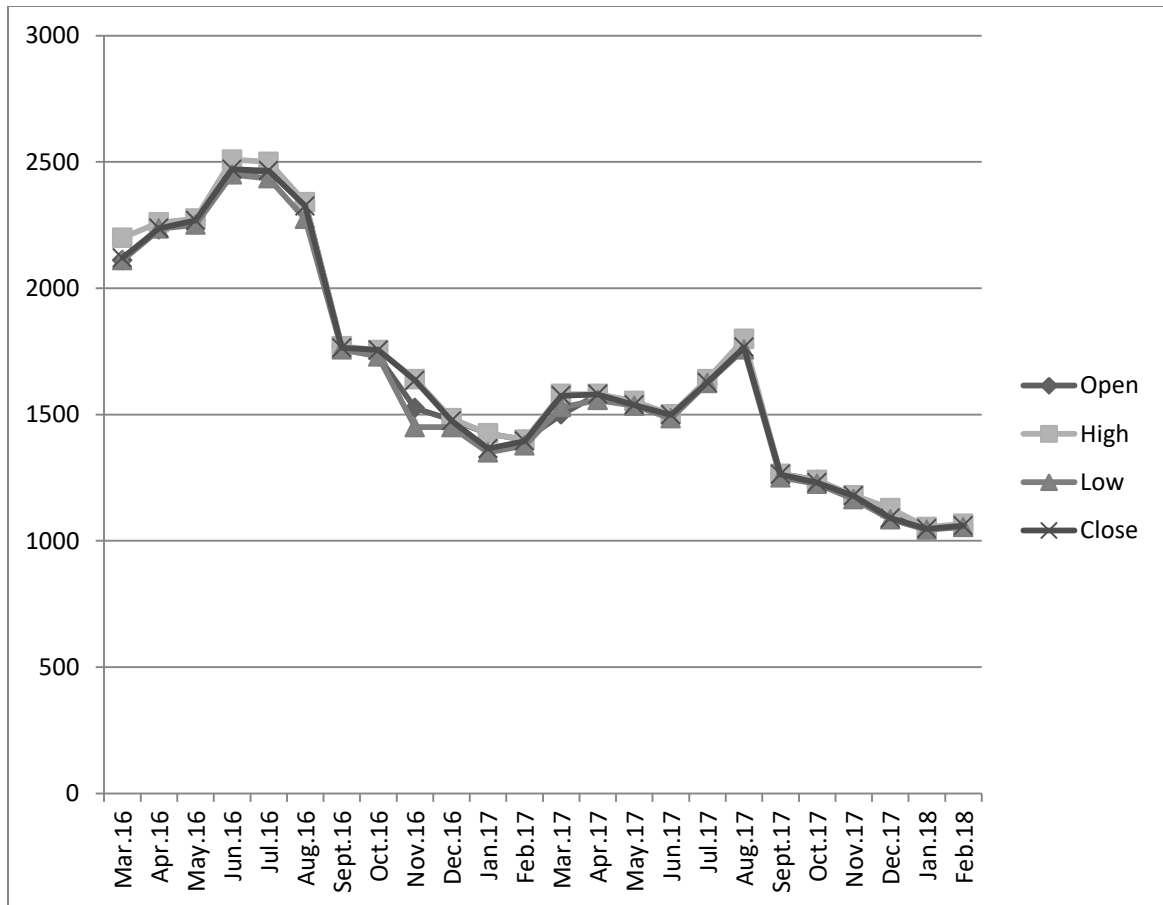


Fig 4.2.1 Line chart of Nabil Bank Limited

Charts of Nabil represents the variation in different prices such as open, high, low and close in respect of different months which we had taken into consideration i.e. from March 2016 to 18th February 2018.

First in the above figure, the open prices which is Rs. 2111 (in March) and it decrease to Rs.1060 in February-2018 with slight variation in prices. The highest open price is Rs.2466 and lowest price is Rs.1060.

Secondly it can be considered the high prices which is Rs. 2200 (in March) and it decrease to Rs.1067 in February-2018 slight variation in prices. The highest in high price is Rs.2509 and low price is Rs.1055.

Thirdly it can be considered the low prices which is Rs. 2111 (in March) and it decrease to Rs.1055 in February-2018 with slight variation in prices. The highest low price is Rs.1055 and least low price is Rs.2450.

Fourthly it can be considered the close price which is Rs. 2120 and it decrease to Rs 1060 in March-2016 with slight increment or decrement in prices. The highest close price is Rs.2471 and low price is Rs.1048

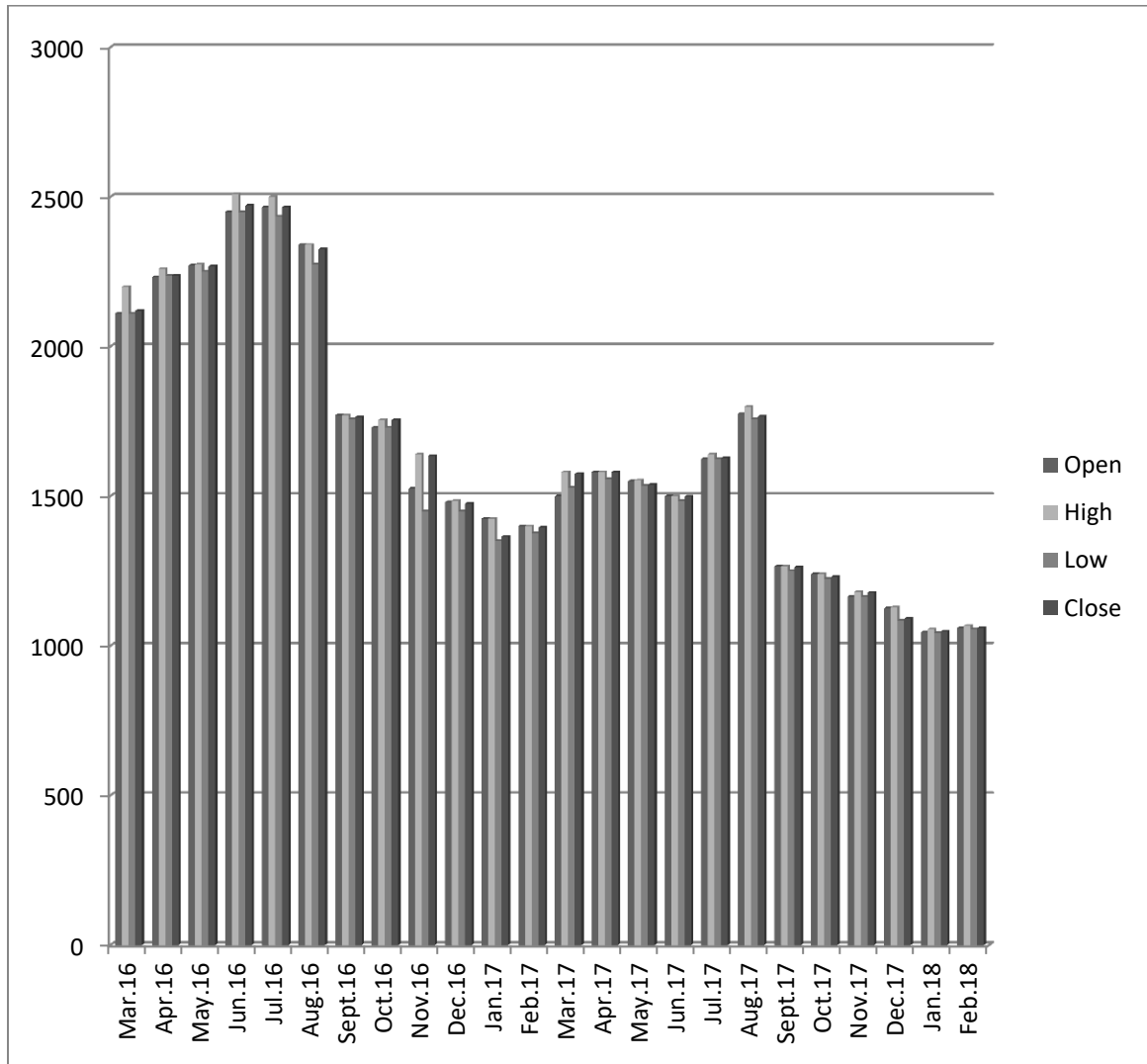
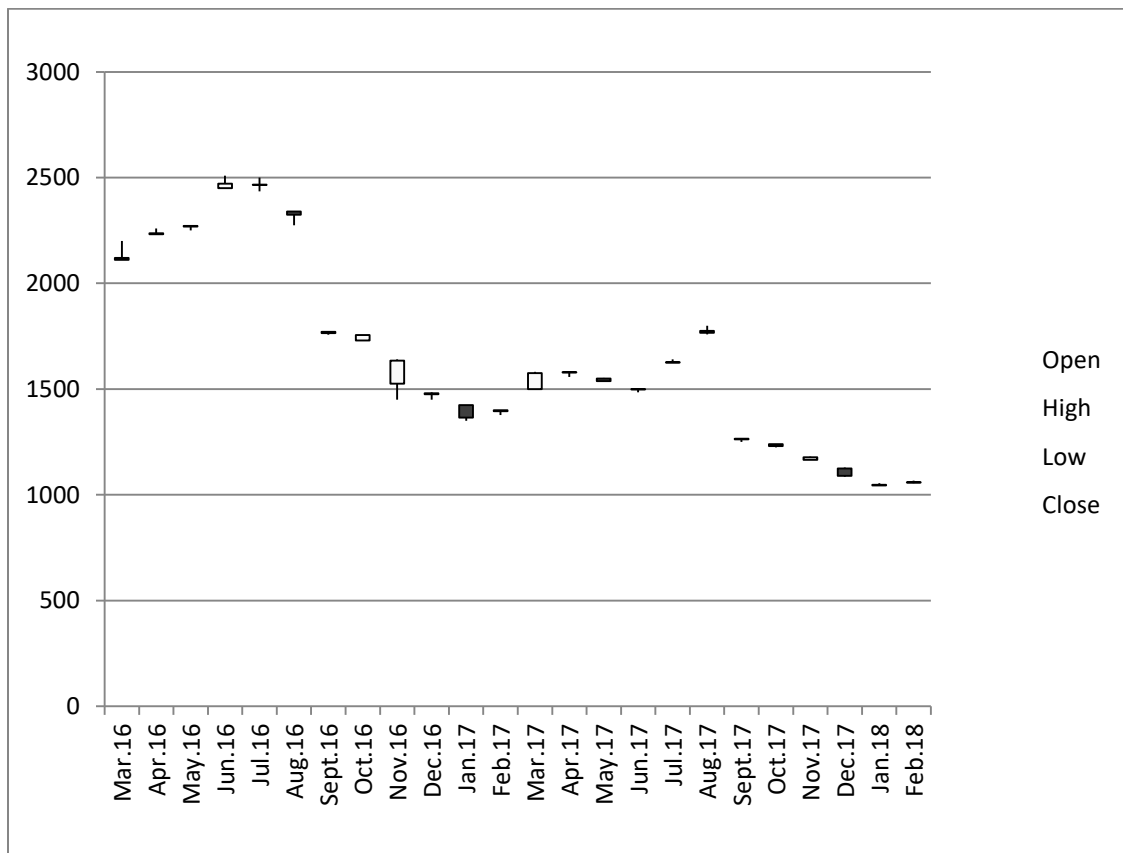


Fig 4.2.2 Column chart of Nabil Bank Limited

From the column chart of Nabil it was found that in Jun. 2017, the share of Nabil is Rs.1499 and which increases in Aug.2017 to Rs.1766 which is high from the previous one. It also goes down in the Oct.2017 to Rs.1230 which is low from the previous one. The highest closing price in 2016 is Rs2471 whereas it is Rs1766 in 2017. It shows decreasing trend in following year. The highest opening price in 2016 is Rs2466 whereas it is Rs1775 in next year. The buyers will be eager to buy stocks whereas sellers will be inactive and will be hoping for the increase in price for profit.

Fig 4.2.3 Candlestick of Nabil Bank Limited



From the stock chart of Nabil it can be figured out higher high and higher low pattern. In May. 2017 the share price was Rs.1538 and it goes in downward direction and after some period it is found to be at the level in Aug.2017 of Rs.1766 and again after Nov. 2017, it has a decreasing and increasing trend. When the share prices are at the peak the investors

are ready to sell. Because after reaching the peak, the prices are expected to decline so the investors make a sell signal. Hence there is decreasing price compared to the previous one, investors make buy decision.

4.3 Stock Price of Butwal Power Company Limited

Table 4.3 indicates the high, low, opening and closing price of Butwal Power Company Limited from period 2016 to 2018

Table 4.3. Stock price of Butwal Power Company Limited

Months	Open	High	Low	Close
Mar.16	575	586	579	580
Apr.16	616	630	616	630
May.16	601	603	601	602
Jun.16	683	739	693	738
Jul.16	930	929	909	929
Aug.16	938	1008	920	995
Sept.16	860	860	813	839
Oct.16	810	810	804	804
Nov.16	799	800	790	790
Dec.16	650	683	650	680
Jan.17	571	580	550	550
Feb.17	491	512	485	512
Mar.17	487	490	487	490
Apr.17	682	700	669	675
May.17	683	683	683	683
Jun.17	655	693	654	693
Jul.17	642	642	635	640
Aug.17	640	655	640	650
Sept.17	624	624	620	624
Oct.17	625	625	615	616
Nov.17	732	741	702	729
Dec.17	684	684	664	675
Jan.18	625	625	604	617
Feb.18	540	540	512	518

Note: From Merolagani.com

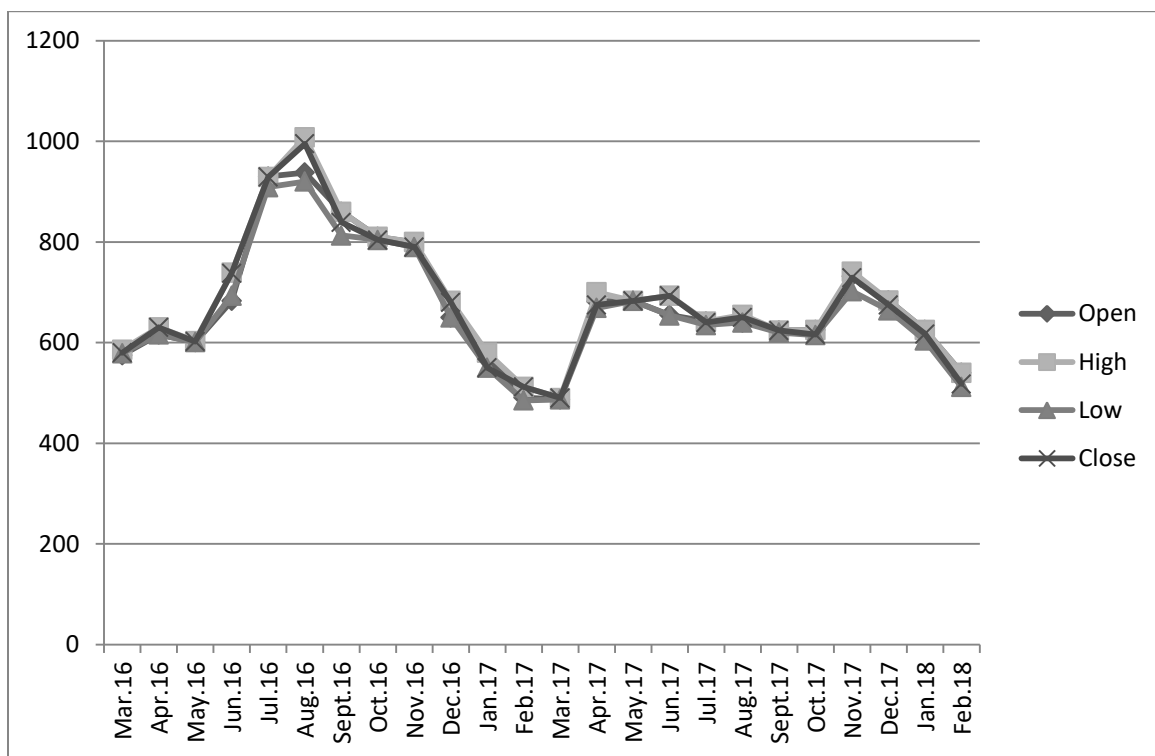


Fig 4.3.1 Line chart of Butwal Power Company Limited

Charts of BPCL represent the variations in different prices such as open, high, low and close in respect of different months which we had taken into consideration i.e. from March 2016 to February 2018

First in above figure it is considered the open price which is Rs. 575 (in March 2016) and it decreases to Rs.540 in February 2018 with slight variation in prices. The highest open price is Rs. 938 and lowest price is Rs.487.

Secondly it is considered the high price which is Rs. 586 (in March 2016) and it decreases to Rs.540 in February 2018 with slight variation in prices. The highest in high price is Rs.1008 and low price is Rs.490.

Thirdly it is considered the low price which is Rs. 579 (in March 2016) and it decreases to Rs.512 in February 2018 with slight variation in prices. The highest open price in low prices is Rs.920 and low price is Rs.485.

Fourthly it is considered the close price which is Rs. 580 (in March 2016) and it decreases to Rs.518 in February 2018 with slight increment or decrement in prices. The highest open in close prices is Rs.995 and low price is Rs.490.

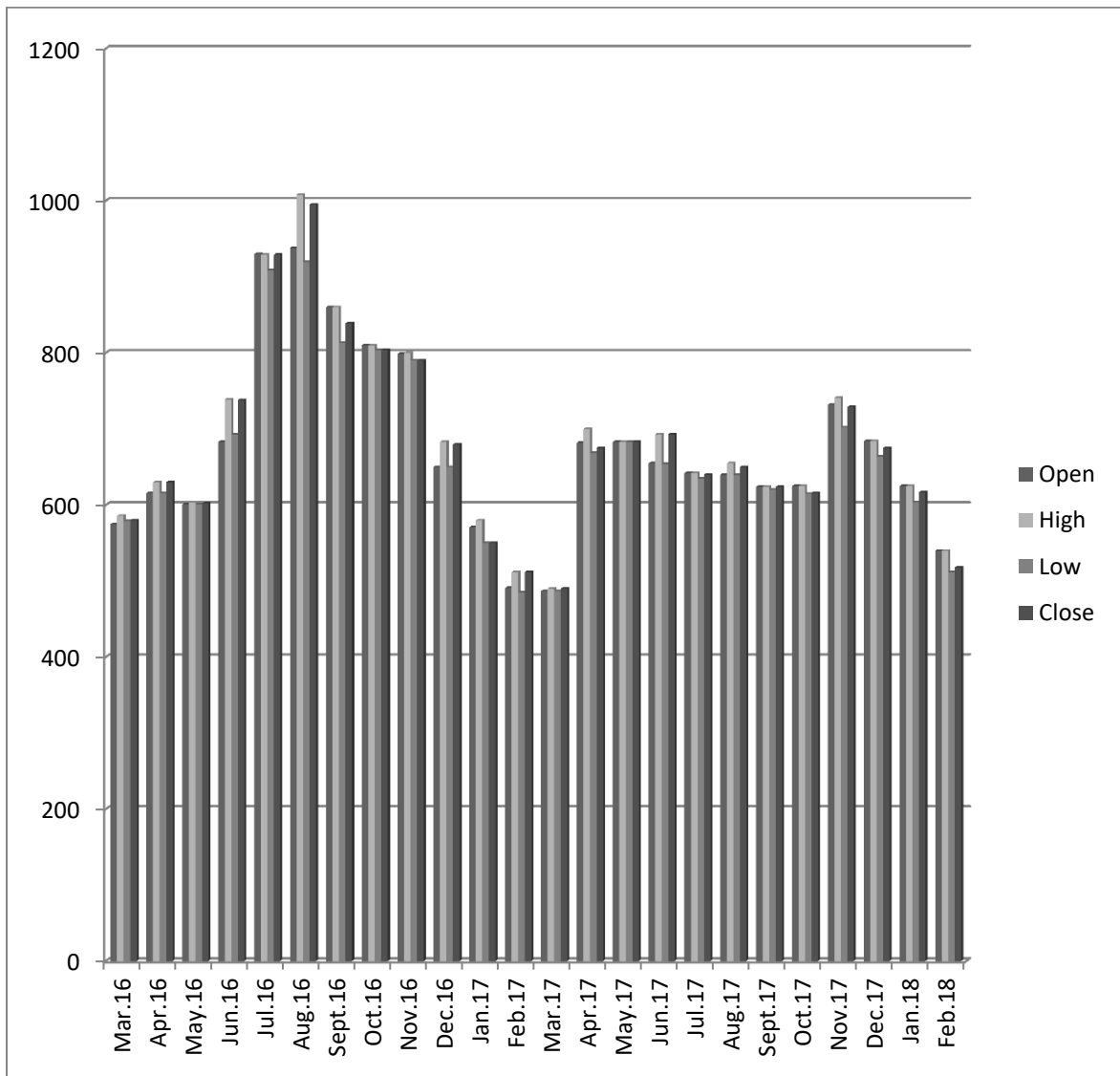


Fig 4.3.2 Column chart of Butwal Power Company Limited

From the COLUMN chart of BPCL it can be spot that the share prices of BPCL are in up and down trend. The share price decreases because of profit making in this period. Aug 2016 it is Rs.995. and in this period the share prices of BPCL is continuously decreasing.

This shows a decrease in the overall profit of the company. Decrease in the share price continues till February, 2018 to Rs.518.

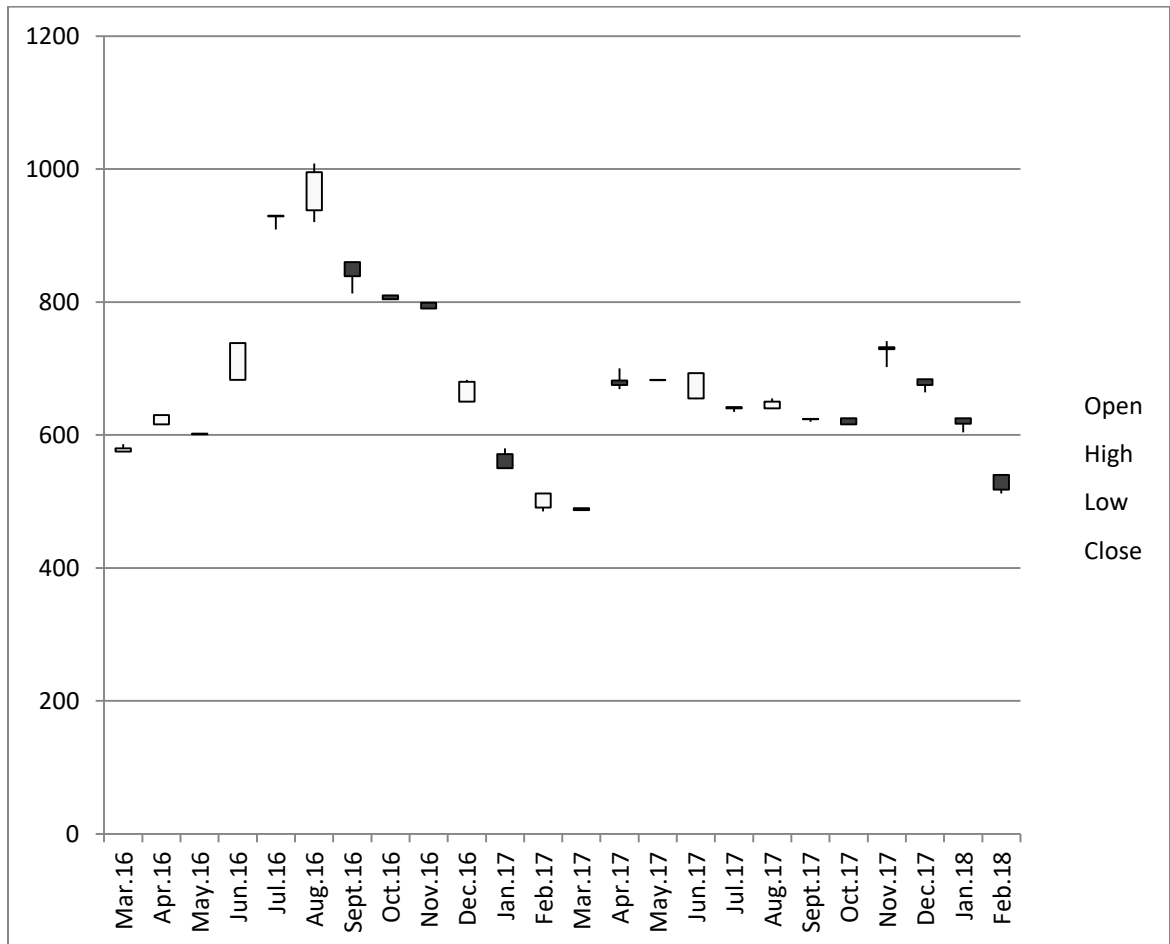


Fig 4.3.3 Candlestick of Butwal Power Company Limited

From the stock chart of BPCL it can be spot higher high and higher low pattern. In April, 2017 the share price was Rs.675 and it goes in downward direction and after some period it is found to be at the same level in Dec.2017 and again after Dec. 2017, it has a decreasing trend. This creates a head and shoulder pattern. When the share prices are at the peak the investors are ready to sell. Because after reaching the peak, the prices are expected to decline and hence the investors make a sell signal.

4.4 Technical Indicators for Soaltee Hotel Limited

In this study, the researcher has used technical indicators like exponential moving average, moving average convergence divergence and relative strength index.

4.4.1 Exponential moving average



Fig 4.4.1 EMA, MACD AND RSI

In the fig 4.4.1 two smoothing curves are drawn along with the price curve. EMA 12 represents the 12 day exponential moving average (fast moving average) while EMA 26 represents the 26 day exponential moving average (slow moving average). The purpose of this chart is to identify the price trend and to identify trading signals. A BUY signal is generated if the faster moving average crosses above the slower moving averages. A SELL signal is generated if the faster moving average crosses below the slower moving averages. From the above chart it can be found that: Both the EMA 12 and EMA 26 are decreasing. The EMA 12 (fast moving average) is below the EMA 26 (slow moving average). Hence the trend of SHL is considered to be downward or Bearish trend.

Moving Average Convergence Divergence

The signal line crosses below the MACD line, but also crosses the zero line at same time so we would expect prices to increase. When signal line crosses over the MACD line, we can see prices in decreasing trend. Looking at the MACD line on the chart we will see that it is in fact consistently below the zero line, prices are in fact in a very bearish trend they continue to drop.

Relative Strength Index

In the above chart the price line and the 14 day RSI line are plotted. The RSI line shown at the bottom of the chart is used to identify the overbought and over sold situations. If RSI crosses “above 70” level the stock is considered to be oversold and so there are chances for trend reversal. If the RSI falls below 30 level the stock is considered to be overbought and hence undervalued. So there are chances for a trend reversal. While near the end of the period, it is above 30, which indicates a bullish trend where sellers tried their best to raise the price. In November we can see that there is oversold situation and sellers will be few and thus demand will be increasing and market will be in uptrend and price will rise. It is giving buy signal in February so investors will be interested in buying stocks.

4.5 Technical indicators for Nabil Bank Limited

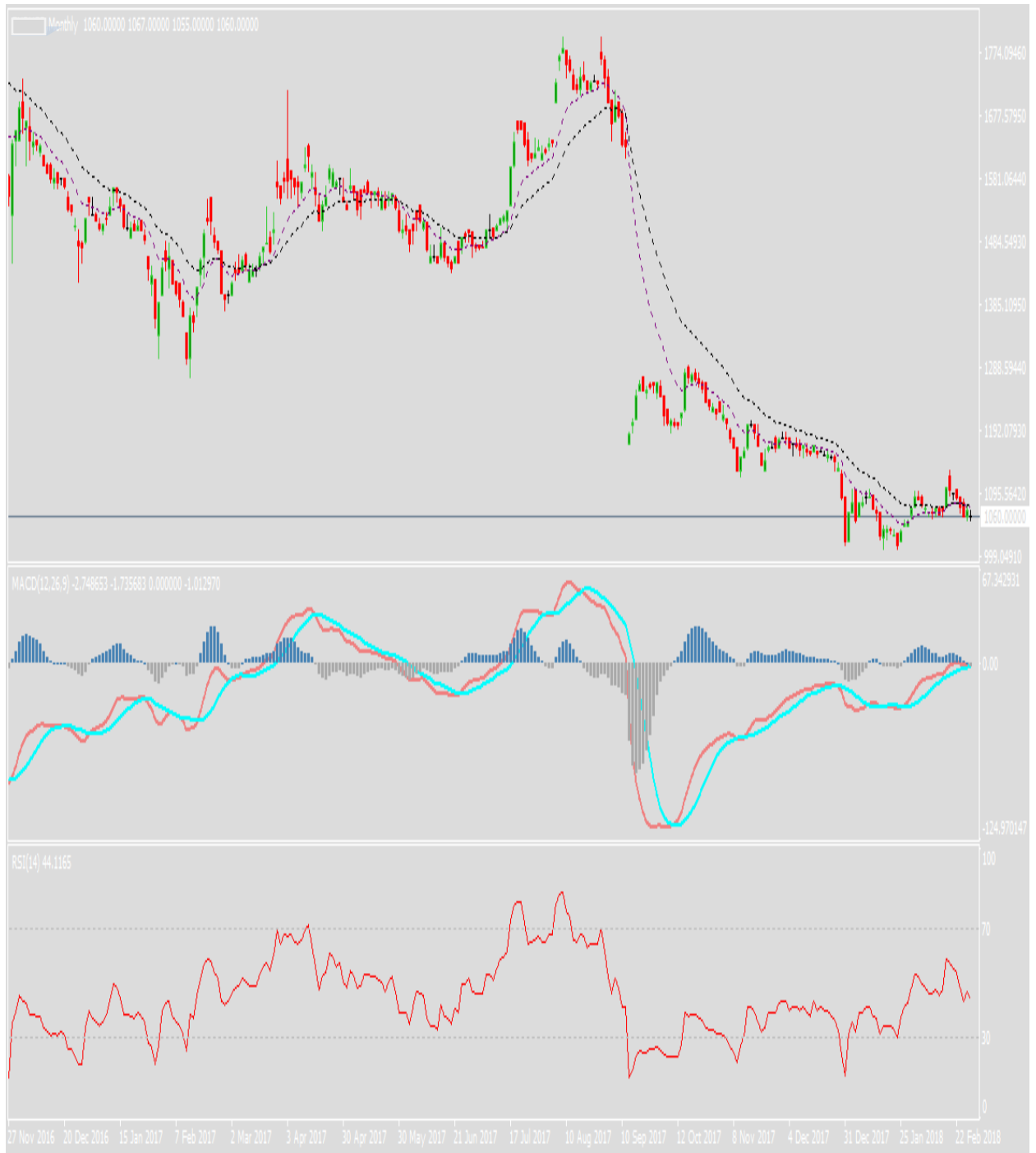


Fig 4.5 EMA, MACD AND RSI

4.5.1 Exponential Moving average (EMA):

In the fig 4.5 two smoothing curves are drawn along with the price curve. EMA 12 represents the 12 day exponential moving average (fast moving average) while EMA 26 represents the 26 day exponential moving average (slow moving average). The purpose of this chart is to identify the price trend and to identify trading signals. A BUY signal is generated if the faster moving average crosses above the slower moving averages. A SELL signal is generated if the faster moving average crosses below the slower moving averages. From the above chart we can see that both the EMA 12 and EMA 26 are falling. The price is located above and below both the moving averages. The EMA 12 (fast moving average) is above the EMA 26 (slow moving average). Hence the trend of Nabil is considered down ward or bearish.

Moving Average Convergence Divergence:

A buy signal occurs when the MACD line crosses above the signal line. When signal line cross above the zero line, prices did tend to go up. Signal line crosses over the MACD line but also crosses the zero line at the same time so we can see price is in decreasing trend. At the point as the MACD line drops below the zero it tells us that the market is quiter bearish during this interval or period of time.

Relative Strength Index:

In the above chart the price line and the 14 day RSI line are plotted. The RSI line shown at the bottom of the chart is used to identify the overbought and over sold situations. If RSI crosses “above 70” level the stock is considered to be oversold and so there are chances for trend reversal. If the RSI falls below 30 level the stock is considered to be oversold and hence undervalued. In the above chart the price line and the 14 day RSI line are plotted. Between August and September this trend’s top has come, now there will not be enough buyers and demand will be low so price will be in decreasing trendIt is giving

4.6.1 Exponential Moving Average (EMA):

sell signal between August and September time period and buy signal in January 2018. At present RSI is between 50 and 70 which indicate that the prices may rise in future.

4.6 Technical indicators for Butwal Power Company Limited

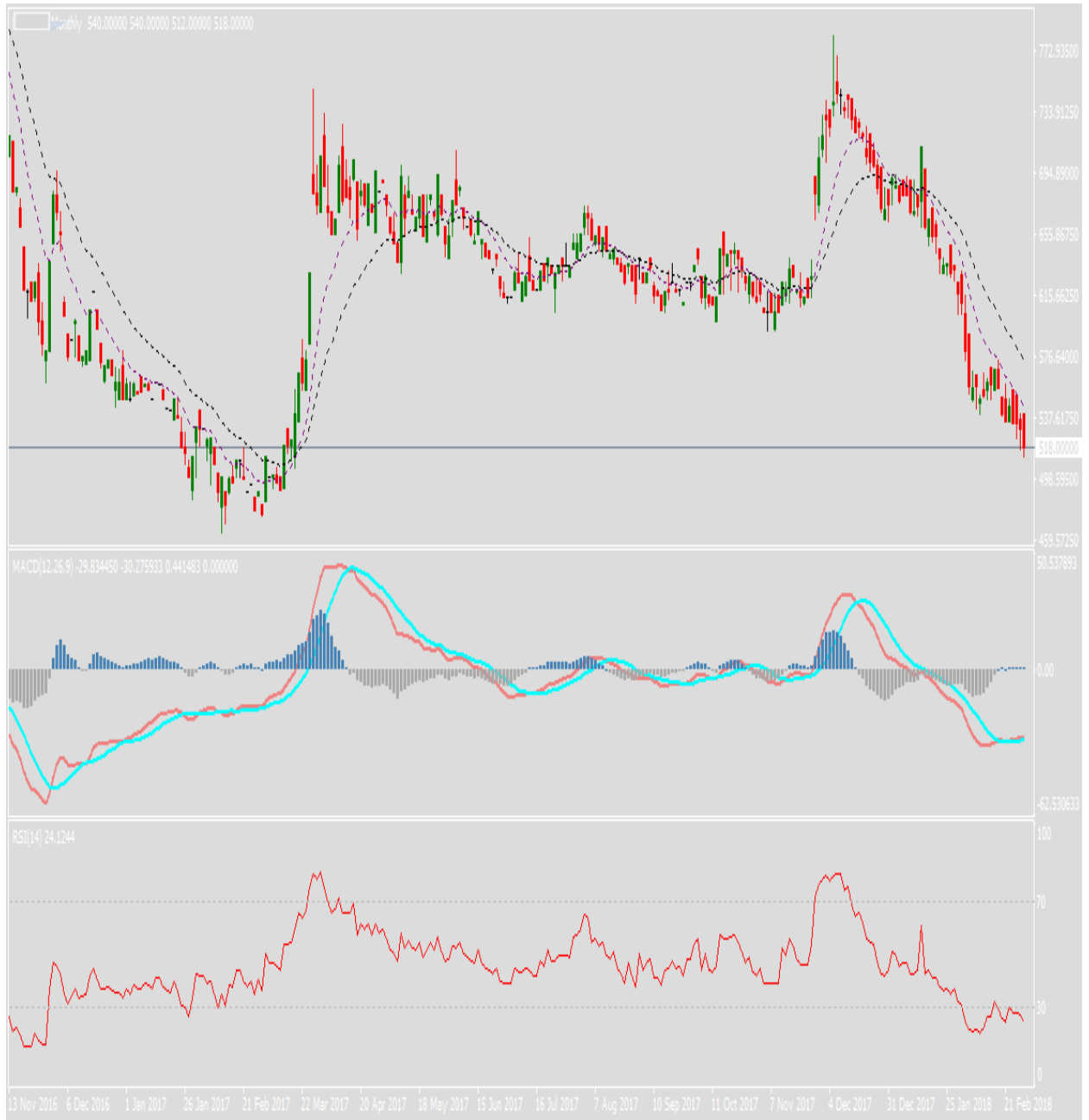


FIG 4.6 EMA, MACD AND RSI

In the fig 4.6 smoothing curves are drawn along with the price curve. EMA 12 represents the 12 day exponential moving average (fast moving average) while EMA 26 represents the 26 day exponential moving average (slow moving average). The purpose of this chart is to identify the price trend and to identify trading signals. A BUY signal is generated if the faster moving average crosses above the slower moving averages. A SELL signal is generated if the faster moving average crosses below the slower moving averages. From fig 4.6 it can be seen that: Both the EMA 12 and EMA 26 are falling and rising. The EMA 12 (fast moving average) is above the EMA 26 (slow moving average). Hence the trend of BPCL is considered fluctuating.

Moving Average Convergence Divergence:

MACD line is right on the zero line and now taking a look at what is happening in prices, we can see that we have a sideways movement or a consolidation pattern and there is no clear direction in the market i.e there is really no momentum. Often many traders prefer to be out of the market during these types of period.

Relative Strength Index:

In the fig 4.6 the price line and the 14 day RSI line are plotted. The RSI line shown at the bottom of the chart is used to identify the overbought and over sold situations. If RSI crosses “above 70” level the stock is considered to be oversold and so there are chances for trend reversal. If the RSI falls below 30 level the stock is considered to be oversold and hence undervalued. In the above chart the price line and the 14 day RSI line are plotted. At present RSI will be below 30 which indicate that the prices may rise in future. It indicates buy signal and thus investors will be interested in buying stock and hope for the price increment in future.

4.6 Major Findings

- 1) The highest open price of SHL is 437 and lowest price is Rs.253. Similarly the highest in high price is Rs.445 and lowest price is Rs.253.
- 2) In Jan. 2017, the share price of SHL was Rs.287 and it has decreased in Feb.2017 to Rs 261 which is low from the previous one. The highest opening price in 2016 is Rs 437 whereas it is Rs 373 in next year. The buyers will be eager to buy stocks whereas sellers will be inactive and will be hoping for the increase in price for profit.
- 3) Candlestick of SHL creates a head and shoulder pattern. When the share prices are at the peak the investors are ready to sell.
- 4) The highest open price of Nabil is Rs.2466 whereas it is Rs1775 in next year. The buyers will be eager to buy stocks whereas sellers will be inactive .The highest low price is Rs.1055
- 5) In May. 2017 the share price of Nabil was Rs.1538 and it goes in downward direction and after some period it is found to be at the level in Aug.2017 of Rs.1766 and again after Nov. 2017, it has a decreasing and increasing trend.
- 6) The highest open price of BPCL is Rs. 938 and lowest price is Rs.487.
- 7) Decrease in the share price continues till February.2018 to Rs.518 of BPCL.
- 8) The trend of SHL is considered to be downward or Bearish trend.
- 9) Looking at the MACD line we will see that it is in fact consistently below the zero line, prices are in fact in a very bearish trend they continue to drop
- 10) Using RSI at the end of the period, it is above 30, which indicates a bullish trend where sellers tried their best to raise the price. It is giving buy signal in February so investors will be interested in buying stocks.
- 11) The trend of Nabil is considered down ward or bearish
- 12) At the point as the MACD line of Nabil drops below the zero it tells us that the market is quiter bearish during the interval or period of time.
- 13) RSI of Nabil is between 50 and 70 which indicate that the prices may rise in future.

14) The trend of BPCL is considered fluctuating. MACD line is right on the zero line, there is no clear direction in the market i.e there is really no momentum. Often many traders prefer to be out of the market during these types of period.

15) RSI of BPCL will be below 30 which indicate that the prices may rise in future.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATION

This chapter summarizes the research process and result of the study. The entire chapter is summarized in two sections. The first one summarizes the study and general overview about research findings. The second section derives the conclusion of the study and suggests some recommendations.

5.1 Summary

The research tries to explore the technical analysis of selected stocks, when do we use technical indicators and how do we apply it for technical analysis in Nepal. This study examined the technical analysis in Nepal for the period 2016/17 to 2017/18. Technical analysis is examined through technical indicators such as Exponential Moving Average, Moving Average Convergence Divergence and Relative Strength Index.

The study started with explaining the background and statement of the problem concerning technical analysis. On the basis of two study objectives which are to assess the status of Moving Average Convergence Divergence and Relative Strength Index of equity shares of sample banks for making buy or sell decision and to analyze the trend of the share prices of the sample through Moving Average Convergence Divergence and Relative Strength Index. It includes significance of the study which reflect the meaning of the research work to researcher personally and includes how the research benefits or impact others in part or whole and the definition of term were identified.

For the purpose of objectives, literature was performed into two parts which are literature review described technical analysis. Theoretical framework illustrated the efficient market hypothesis. Concluding remarks includes the research gap about concerned topic.

As per the study of objectives, research design, population and sample, nature and source of data, methods of analysis, tools and methodology and limitation of the study were determined. Descriptive and analytical research design has been in the analysis.

Secondary data has been used in the analysis. For the purpose of conducting the study, energy industry, banking service and a hotel is selected.

Presentation and analysis of data includes tables, figure from the use of technical indicators.

From the data analysis, conclusions were drawn on the basis of which recommendation were developed.

5.2 Conclusions

Technical analysis is a technique which gives an idea about future share prices of selected companies in which we invest. On the basis of the knowledge of technical analysis one can predict the perfect investment decision of the stock market. Technical analysis is based on published capital market data as opposed to fundamental data, such as earning, sales, growth rates, or government regulation. Market data include the price of a share or the level of a market index, volume (number of share traded). Technical analysis of stock prices of different companies gives an idea that after the analysis the market position of share of selected companies can be known and investor get a perfect knowledge of investment decision. The investment decision can be taken by proper technical analysis. By using the technical indicators the future market of securities would be known in which we invest. Technical analysis helps to predict future share prices of a selected company and also predict a trend of a selected company by which we make a perfect decision of investment in the stock market. On the basis of the findings, conclusion were drawn and recommendation made in the final chapter.

5.2.1 Specific Conclusion

The results obtained from technical indicators are summarized below:

In this research we have selected stock prices of three companies for carrying out the technical analysis of these stock prices. Which the possibilities of getting a maximum benefit by investing in these companies and also Technical indicator that is EMA, MACD, RSI gives a perfect information about the stock prices of selected companies and in which direction the trend of share of selected company goes. For the more accurate

prediction of stock prices of selected companies investor should also carry out fundamental analysis of stock prices, by which investor can make investment decision of future trend of stock prices. Thus Technical Analysis seeks to identify changes in the price movement and take a position in the share to take advantage of the trend. Technical analysis is widely used by forex, equity, and commodity traders, to determine the short term as well as the long term trends of the market. The scope of technical analysis is increasing every day, as more and more people are trying to learn the skills of technical analysis to earn good returns. The biggest advantage of technical analysis is that it helps investors and traders predict the trend of the market. Up trend, downtrend, and sideways moves of the market are easy to predict, with the help of chart analysis. Timing plays an important role in trading and investing. With the help of technical analysis, traders and investors can predict the right time to enter and exit a trade thereby enabling good returns. Chart patterns, candlesticks, moving averages, and other indicators are very useful for traders to make entry and exit points. Technical analysis gives early signals and also paints a picture about the psychology of investors and traders regarding what they are doing. Price-volume analysis also indicates the movement of market makers and their activities related to a particular market. Another main advantage of technical analysis is that it gives an early signal when it comes to trend reversal. In currency trading, technical analysis is less expensive as compared to the fundamental analysis and there are so many companies that provide free charting software. Technical analysis gives a quick result for traders who use 1 minute, 5 minutes, 30 minutes, and 1 hour charts. For instance, the formation of a head and shoulder on 1 minute and 5 minutes chart gives fast results, as compared to the daily chart. Technical analysis is helpful for short term trading, swing trading, and long term investing. Technical charts provide a lot of information that helps the traders and investors build their positions and take trades. Information like support, resistance, chart pattern, momentum of the market, volatility, and trader's psychology are just some examples of types of information provided by technical analysis and used by traders in the Forex market. With many advantages, it is essential for every investor to learn about technical analysis. The investors will get idea beforehand the momentum of

the market. From this study, we can conclude that buy and sell decision can be taken through technical indicators.

5.2.2 Combined Conclusion

The main aim of the study was to find out moving average convergence divergence and relative strength index of selected sectors in Nepalese context. On the basis of prediction of three companies (i.e. SCL, Nabil and BPCL) we can predict a large growth of companies in future. Based on the survey, descriptive and analytical study, analysis and findings, it can be concluded that when the price is in decreasing trend, the investors prefers to buy the stocks.

In future the overall growth of these companies will be more. Because on the basis of the technical indicator the actual trend of the stock prices of these companies will be known which tells that the stock prices of these companies have less fluctuation in the trend and investment in these companies will be benefited. On the basis of the line chart, column chart and stock chart the investor can get an idea about the future share price trend of these companies also get information about the growth of the overall financial sector in future. The technical analysis of selected top three companies tells that the growth in the market. On the basis of the technical indicator these three companies overall result will be known of the stock market. This analysis tells that the future trend would be known by technical indicator. And the investment in these companies will be benefited. Different pattern of stock prices of these companies give an idea of future trend of these companies. And the position of these companies in the market and perfect knowledge on investment in these companies will be analyzed. The market technicians have a perfect knowledge of the pattern, trend by which the investment decision of stock prices of selected companies can be taken. The technical analysts believe that share prices show identifiable trade situation that can be exploited by investors. In this way technical analysis give guidance to the investors.

5.3 Recommendations

Various researches have been undertaken in technical analysis. This study is to find out the technical analysis. This study is to find out the technical analysis of different sectors in Nepalese context. So, it only includes study of technical indicators, chart, and candlestick in Nepalese economic sectors. There are few or no researches conducted in technical analysis in Nepal. Technical analysis being the broad concept, the researcher has only focused on moving average convergence divergence and relative strength index which does not conclude entire concept of technical analysis. Therefore further research can be done about nature of technical analysis, source of technical analysis, role of technical analysis in decision making while buying and selling of stocks and its impact on use of technical analysis. Some of the recommendations are mentioned below:

- Technical analysis can be further tested through rate of change(ROC).Present study covers the period of only 3 years. Further researcher can enhance the time period for more than 10 years.
- Technical analysis being a broad subject also include Fibonacci ratios, Support and Resistance, Elliott Wave Principles etc
- Simple moving average and dual exponential moving average can also be calculated.
- Relative Vigor Index, Stochastic Oscillator, Trix etc price-based indicators can be used in technical analysis.
- Technical analysis can be done through trading with mixing indicators like MACD & Average Directional Index, MACD & SuperTrend etc.

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