

**FINANCIAL STRATEGY FOR CORPORATE VALUE CREATION;  
AN INVESTIGATION INTO EQUITY BUYBACK AND STOCK SPLITS OF  
SELECT INDIAN COMPANIES**

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**GOA UNIVERSITY**

by

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**JUNE 2016**

**DEDICATED TO**

My Grand Parents

**LATE SHRI. VITOBHA AND SMT. RUKMINI**

## **DECLARATION**

I, Prabhakar Umesh Rane, hereby declare that the work reported in this thesis entitled “Financial Strategy for Corporate Value Creation; An Investigation into Equity Buyback and Stock Splits of select Indian Companies” submitted to the Goa University, Taleigao - Goa in partial fulfillment of the requirements for the award of the degree of Doctor of Philosophy in Commerce is an authentic record of my work carried out under the supervision of Dr. B. Ramesh, Professor, Department of Commerce, Goa University, Goa.

This work has not previously formed the basis for the award of any degree, diploma or certificate of this or any other university. The references made to the previous works of other authors have been clearly indicated and duly acknowledged in the list of references.

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## **CERTIFICATE**

This is to certify that the work reported in the Ph. D. thesis entitled “Financial Strategy for Corporate Value Creation; An Investigation into Equity Buyback and Stock Splits of select Indian Companies” submitted by Mr. Prabhakar Umesh Rane to the Goa University, Goa for the award of the degree of Doctor of Philosophy in Commerce is a bonafide record of his original work carried out by him under my supervision and guidance.

This work has not been submitted elsewhere in part or in full to any other university or institution of learning for the award of any other degree or diploma.

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## LIST OF ABBREVIATIONS

| Sr. No. | Abbreviations | Full Form   |
|---------|---------------|---|
| 1       | AMEX          | American Stock Exchange                           |
| 2       | AARs          | Average Abnormal Returns                          |
| 3       | BSE           | Bombay Stock Exchange                             |
| 4       | CARs          | Cumulative Abnormal Returns                       |
| 5       | CAARs         | Cumulative Average Abnormal Returns               |
| 6       | EPS           | Earnings per share                                |
| 7       | EPSAABB       | EPS after announcement of Buyback                 |
| 8       | EPSBABB       | EPS before announcement of Buyback                |
| 9       | EPSYABB       | EPS in the year of announcement of Buyback        |
| 10      | LS            | Level of Significance                             |
| 11      | NSE           | National Stock Exchange                           |
| 12      | NYSE          | New York Stock Exchange                           |
| 13      | OHY           | One and Half Years                                |
| 14      | OTC           | Over the Counter                                  |
| 15      | SEBI          | Securities and Exchange Board of India            |
| 16      | SM            | Six Months  |
| 17      | SPAABB        | Stock Price after announcement of Buyback         |
| 18      | SPBABB        | Stock Price before announcement of Buyback        |
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| 20      | TY            | Two Years   |
| 21      | VT            | Volume of Trading                                 |
| 22      | VTAASS        | VT after announcement of Stock Splits             |
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## **PUBLICATIONS**

- 1) Shareholder Value Creation through Buyback of Equity: An Earnings per Share Measurement Analysis, Indian Journal of Accounting, ISSN-0972-1479, Vol. XLIV (2), June, 2013, pp. 1- 5.
  
- 2) Buyback of Equity: A Case Study of Reliance Industries Ltd. (RIL), Journal of Modern Management & Entrepreneurship, ISSN: 2231-16X, Volume - 04, No. 01, January, 2014, pp.188-194.
  
- 3) Stock Market Reaction to Buyback Announcement of Reliance Industries Ltd. – An Empirical Study, International Journal of Marketing & Financial Management, ISSN: 2348-3954, Vol. 2, Issue: 5, June, 2014, pp. 31-39.

CHAPTER 1  
**INTRODUCTION**

# INTRODUCTION

## 1.1 Corporate Value Creation

The corporate value creation means creation of the value for the shareholders. The value for the shareholders may be created in the form of dividends, capital appreciation, capital gains or increase in the proportional holding of shareholders on the company. But, the financial strategy for corporate value creation refers to the strategy adopted for the creation of the value for the shareholders. It implies procurement and deployment of funds and redistribution of equity component of capital.

The procurement and deployment funds may involve raising the funds by issuing equity shares, preference shares, debentures or loans and properly employing them in a highly profitable business venture while the redistribution of equity component of capital may be done by buying back of own shares either to distribute the surplus cash or to signal the undervaluation of stock or by splitting the stock of a larger denomination into a smaller to make the stock cheaper and affordable to the new investors to increase the volume of trading.

## 1.2 Stock Buyback

### 1.2.1 Concept of Buyback

Stock buyback means buying the shares which were issued earlier by a company. In other words, it means investing company's surplus funds in its own stocks. Share buyback may be made through open market operation method, fixed price tender offer method, book building method or negotiated deals method. Buyback of equity decreases the number of outstanding shares and increases the earnings per share. However, it signals the undervaluation of stock and better prospects for the company in the future.

## **1.2.2 Origin of Stock Buyback**

Share repurchase is an activity which was originated in the United States of America. The United States of America was the first country in the world to allow the resident firms to repurchase their shares from the shareholders. However, it gained the momentum and the popularity, when the US companies began adopting the buyback program in large numbers in the early 1980s. Thus, the US buyback movement went global in the 1990s. In the 1990s and thereafter, many countries like United Kingdom in 1990, Hong Kong in 1991, Korea in 1994, Japan in 1995, Denmark in 1995, Finland in 1997, Germany in 1998, France in 1998 and India in 1998 removed the restrictions and allowed the companies to buy back their shares from their own shareholders.

## **1.2.3 Kinds of Buyback of Shares**

There are two kinds of Stock buyback viz., share buyback for reducing the capital and share buyback for treasury operation. The basic difference between share buyback for reducing the capital and share buyback for treasury operation is that in the case of the former the shares are extinguished while in respect of the latter the shares are kept in the treasury for the operation. The share buyback for reducing the capital and share buyback for treasury operation are briefly explained below;

### **1) Share Buyback for Reducing the Capital**

When a company buys back its own shares for reducing the share capital, the following adjustments are to be made to the share capital and the buyback price;

- a) The equity share capital is reduced by the par value of the shares bought back by the company.
- b) The excess of price paid for buying back the shares above the par value is reduced from the free reserves and surplus.

c) The shares bought back are physically destroyed by the company.

## **2) Share Buyback for Treasury Operation**

If a company repurchases its own shares for treasury operation, the following procedure is to be followed;

- a) The share capital is not reduced by the par value of shares repurchased by the company.
- b) The excess of price paid for buyback of shares above the par value is reduced from the free reserves and surplus.
- c) The shares repurchased are not extinguished but kept in the treasury as the acquired shares can be reissued by the company at a later stage.

### **1.2.4 Rational for Buyback**

The following are reasons for buyback;

- 1) To restructure the capital structure and capitalization of the company.
- 2) To signal the undervaluation of stock.
- 3) To support the share price during the period of temporary weakness (depression).
- 4) To distribute the surplus cash to the shareholders.
- 5) To increase the earnings per share of the company.
- 6) To increase the promoter's percentage of shareholdings.
- 7) To prevent the hostile takeover bid.
- 8) To lower the tax incidence.
- 9) To protect the interest of existing shareholders from the dilutive effects of stock options,
- 10) To signal the better earnings, financial strength, and better prospects for the company in the future.

## **1.2.5 Methods of Buyback**

The stock buyback can be made by any one of the following methods;

### **1.2.5.1 Tender Offer Method**

The company, under the tender offer method, offers to buy a specified amount shares at a given price known as the tender price until a given expiration date. Usually, the company sets forth the maximum number of shares that it is offering to buy, the fixed price at which it will purchase the shares and the period of time during which the offer will remain open. It is the company which fixes and announces the tender price which is usually set at a premium over the prevalent market price in order to act as an incentive to the shareholders to offer their shares for buyback and also to signal the correct valuation of the stock.

The company can set minimum or maximum limit on the number of shares to be bought. The minimum limit implies that the company may withdraw the offer if the number of shares tendered are less than the desired but the maximum limit is one where the management of the company agrees to buy all the shares tendered even a few of the shares than the number sought are tendered.

The tender offer is made to those shareholders whose names appear in the register of members on or before the record date. The tender offer remains valid till the expiration date which is usually for a period of 15 to 30 days after the offer. The company reserves the right to extend the period of the offer in case it is undersubscribed. If the offer is oversubscribed, the tender offer is made on a pro rata basis to the shareholders. The promoters or the persons having control on the company are allowed to participate in the tender offer method.

### **1.2.5.2 Book Building Method**

Book building method is also known as Dutch auction repurchase method. In this method of buyback of equity shares, the company announces the maximum number of equity shares it wishes to purchase during a specified period of time. The company sets a stock price range between which shareholders bids will be accepted. The shareholders are invited to tender their equity shares at any price within the stated price range. The company, after closing of the offer period, collects the individual offers and sorts them out by price in ascending order until the specified number of shares has been accumulated. The different prices at which buyback is completed is arrived at by adding the number of shares tendered by the shareholders beginning with the lowest end of the price range stated by the company.

The price stops at that point at which the cumulative number shares equal to or exceeds the size of the buyback. Therefore, the buyback price is the lowest price of the series at the cut of point which is equal to the price of the highest accepted bid. All the shareholders who tendered their shares at or below the highest accepted bid are included in the buyback program. The lowest price which is equal to the price of the highest bid is paid to all the shareholders. The shareholders who tendered their shares at prices above the highest accepted bid price are excluded from the buyback program and their shares are returned to them. The offer has to remain open for a minimum period 15 days and a maximum period of 30 days. The promoters of the company can participate in the buyback program under the book building method.

### **1.2.5.3 Open Market Repurchase Method**

Under the open market buyback method, the company buys equity shares or specified securities directly through the stock exchanges or from the intermediaries. The company

announces the maximum number of shares that it wishes to buy from the stock market, the period during which it is going to buy shares and the maximum price at which buyback of shares will be made. The buyback of equity shares will be made by the company at the prevailing stock price on the stock exchange at the time of buyback. The buyback of shares through open market method is generally made when the number of shares sought to be bought is small. The offer is kept open for a period of time which is generally specified by the regulations governing the buyback

#### **1.2.5.4 Negotiated Deals Method**

In the negotiated deals method, the company chooses shareholders or a specific group of shareholders for the buyback operation. The company can bargain with shareholders for prices at which their shares will be repurchased. One of the best examples of negotiated deals method is the buyback rooted through option contracts i.e., call option and put option.

## **1.3 Stock Splits**

### **1.3.1 Concept of Stock Splits**

Stock Splits are corporate actions. They refer to the splitting of the face value of a share of a larger denomination into a number of shares of a smaller denomination. Stock splits increase the number of outstanding shares but the share capital of the company remains the same. There is no outflow of funds. The basic purpose of stock splits is to increase the volume of trading. The popular stock splits ratios are 2 for 1, 3 for 2 and 5 for 4. When a company splits its stock, the market value of stock is reduced by the split ratio. As a result, the stock becomes cheaper and affordable to the new investors.

### **1.3.2 Origin of Stock Splits**

Stock splits were introduced in the financial market for the first time by the United States of America. Since then, they have been prevalent in the many developed and emerging financial markets as one of the widely adopted financial strategies to readjust the capital structure and the capitalization of the company. However, the stock splits became a reality in India only when the Government of India introduced the stock splits in the Indian capital market in 1999.

### **1.3.3 Types of Stock Splits**

Stock splits may be general stock splits or reverse stock splits. The difference between regular stock splits and reverse splits is that the regular stock splits increase the volume of trading and signal the better prospects for the company in the future but the reverse stock splits do not aim at signaling the company's value but moving the share prices to a more attractive trading range. The general stock splits and reverse stock splits are explained below;

#### **1) General Stock Splits**

General stock splits mean splitting the stock of a higher value in to a number of shares of a smaller in value. In other words, they imply splitting the stock of a larger denomination into a number of shares of a smaller denomination. The regular stock splits increase the number of outstanding shares, volume of trading and stock price and signal the better prospects for the company in the future. However, they reduce the stock price by the split factor and decrease the earnings per share but the reduction in the stock price and decrease in the earnings per share do not affect the value of the shareholders. The general stock splits are very common and popular in the corporate world.

## **2) Reverse Stock Splits**

Reverse stock splits literally mean splitting the stock a smaller denomination into fewer stocks of a larger denomination. They decrease the number of outstanding shares and increase the earnings per share. Moreover, they do not signal the value of the company but they move the share price to a more attractive trading zone. The reverse stock splits are not common and popular as compared to the general stock splits.

### **1.3.4 Reasons for Stock Splits**

The reasons for stock splits are as follows;

1. To reduce the face value of a stock to readjust the capital structure without inflow or outflow of funds.
2. To increase the number of outstanding shares i. e., free float in the market.
3. To increase the liquidity and market capitalization of a stock.
4. To bring down the market price of a stock to a reasonable level to make it cheaper and affordable to the newer class of investors.
5. To rest the fear of hostile takeover and stock accumulation by raiders.
6. To signal the undervaluation of stock.
7. To signal the financial strength and better prospects for the company in the future.

### **1.3.5 Stages of Stock Splits**

The life cycle of stock splits involves the following six major stages;

#### **1.3.5.1 Pre-announcement**

Stocks normally enter the pre-announcement stage quietly after a long period of healthy growth. However, in some stocks, it occurs quickly due to the unexpected rise in the stock price. This stage of stock splits is often associated with significant rise in the stock price.

### **1.3.5.2 Announcement**

The announcement stage of stock splits pulls in a large number of new buyers. As a result of the unexpected demand for stock, the stock price normally goes higher by giving a chance for abnormal returns for those who positioned in the stock prior to the stock splits announcement.

### **1.3.5.3 Dormancy**

In this stage, the price returns to the normal as the initial interest subsides in the days following stock splits announcement. The shorter the time between the announcement of stock splits and the stock splits date, the lesser the duration of a dormancy stage.

### **1.3.5.4 Pre - split Run**

The investors who missed the chance of accumulating the shares at pre announcement and announcement stage, now, in pre – split run, bid up the price for the limited supply of shares. This stage is just before the split date.

### **1.3.5.5 Stock Splits**

In the stock splits stage (stock split date), the investors buy shares to accumulate them at the lower stock splits price. These final buyers who did not buy shares at the announcement and during the pre – splits run can push the price even higher during the stock splits period.

### **1.3.5.6 Post Splits**

The stock price, in the post splits phase, reacts to the increased supply and retreat for a while. However, the strong performers often quickly dip and then continue to fly higher.

## **1.4 Nature of the Problem**

The creation of corporate value is one of the significant functions of the organization. The organizations, throughout the world, adopt different operational and non operational strategies to create the value for the shareholders. The buyback of equity and the stock splits are such non operational strategies which help the organization to create the corporate value for the shareholders.

Stock buyback program generally reduces the number of outstanding shares and signals undervaluation of stock and better prospects for the company in the future. This results in corporate value creation through abnormal returns and increase in the earnings per share.

While when stocks are split, there is an increase in the number of outstanding shares and decrease in the stock price. The decrease in the stock price generally attracts more investors. As a result, the new investors enter the market and increase the volume of trading and drive the price of the stock upward.

However, there are a very few studies conducted on the effects of buyback of equity and stock splits on the shareholder value creation in India. The present study, therefore, concentrates on the following major issues on buyback and stock splits which require thorough investigation through research,

- 1) What is the effect of stock buyback and stock splits on the stock price?
- 2) How buyback and stock splits programs contribute to the corporate value creation?

## **1.5 Objectives of the Study**

The following are objectives of the study;

- 1) To study and analyze the trend in buyback of equity and stock splits of India incorporation during the period of research study.
- 2) To study and analyze the impact of buyback of equity and stock splits announcements on the market price.
- 3) To examine the impact of stock buyback and stock splits announcements on corporate value creation.

## **1.6 Scope of the Study**

The present study concentrates on the shareholder value creation through buyback of equity and stock splits of listed companies in the Indian context. It outlines shareholder value creation through abnormal returns and increase in the earnings per share, volume of trading and stock price. The daily abnormal returns are calculated for each company for 91 days window period i.e., 45 days before and 45 days after from the announcement date of stock buyback and stock splits. The abnormal returns so calculated are averaged for number of sample companies for each day before and after the announcement. In addition to the abnormal returns, the study also compares the earnings per share, stock price and volume of trading after the announcement with the earnings per share, stock price and volume trading before the announcement of stock buyback and stock splits respectively and the stock price on the day of the stock splits announcement with the stock price after the announcement of stock splits for each sample company in order to ascertain whether stock buyback and stock splits create value for the shareholders. Thus, the present study is applicable to stock buyback and stock splits of a company in particular and stock buyback and stock splits of the companies in general.

## **1.7 Research Methodology**

The methodology adopted for carrying out the present research study includes period of the study, sources used to collect the data, variables and key terms selected for the study, tools and techniques used for the data analysis, hypotheses formulated for the study, methods of sampling and sample size used for this research work, organization of the study and limitations of the present research work.

### **1.7.1 Period of the Study**

The empirical studies are being carried out on stock buyback and stock splits for different periods since their introduction in India in 1999 viz., A.K. Mishra (1999-2001), Amitabh Gupta (1999-2004), R.L. Hyderabad (1999-2007) and Pournima Jariwala (2000-2009) on stock buyback and George, Roji (1999-2003), Chhavi Mehta (1999-2007) and Koustubh Kanti Ray (1999-2008) on stock splits. Therefore, the present study goes beyond the period selected by the previous studies and chooses the study period from 1998-99 to 2012-13.

### **1.7.2 Sources of Data**

The information and the data required for the study are collected only from the secondary sources as there is no scope for primary data in the study. The secondary sources include Books, Journals, Hand books, News papers, SEBI website, BSE website, NSE website, Company websites, Money Control.com and Share Khan.com.

### **1.7.3 Data Collection**

The data on the following areas are collected for the purpose of this study;

- 1) The event days of buyback and stock splits are gathered from the websites of the respective companies.

- 2) The data on buyback and stock splits from 1998-99 to 20 12-13 are collected from the SEBI's Status Report on Buyback and the Motilal Oswal data Source respectively.
- 3) The data on the earnings per share are obtained from the money control.com.
- 4) The daily and monthly data on the stock price of buyback companies and stock splits companies are gathered from the BSE Website and the NSE website.
- 5) The monthly data on the volume of trading are obtained from the BSE website and the NSE website
- 6) The daily closing values of the S & P CNX Nifty for the event window period and estimation window period are obtained from the NSE website

## **1.7.4 Key Terms Selected**

### **1.7.4.1 Event Day and Days Surrounding the Event Day**

The date of meeting of the board of directors regarding the announcement of buyback and stock splits is denoted as 'Event Day', the days surrounding the event day i.e., 45 days before and 45 days after the event date are considered as Event Window periods and 248 days period prior to the first day of the event window period i.e., -248 days to -45 days is treated as Estimation Window Period.

### **1.7.4.2 Event Window Period**

The studies carried out so far suffer from a common limitation with regard to the window period. The financial economists' view that the short event windows would capture the announcement effect better than longer windows while the contrary view supports the longer window period as there is a difference between the date of the announcement and the date of actual repurchase and stock splits, Therefore, the present study adopts both the views and selects both shorter and longer window periods in analyzing the market reaction to buyback and stock splits announcements in India. However, the 91 days window period

adopted by the study is beyond the maximum window period of 61 days (-30 to +30) used by the earlier studies.

#### **1.7.4.3 Initial Buyback and Stock Splits**

There are two types of buyback and stock splits viz., first buyback and stock splits and subsequent buyback and stock splits. The study chooses the first buyback and stock splits i.e. Initial buyback and stock splits as the success or failure of the subsequent buyback and stock splits may depend upon the success or failure of the initial buyback and stock splits and not the fundamental factors related to the buyback and stock splits..

#### **1.7.4.4 Estimation Window Period**

The study employs -248 days estimation window period i.e., one year estimation period excluding non working days (104 days) and holidays (approximately 12 days) prior to the first day of the event window of -45 days to calculate the historical beta and alpha to regress and estimate expected returns to compute the abnormal returns for the sample buyback and stock splits companies. One year estimation period is employed by the study as it is widely used by the previous studies and more than the six months period which is normally used for the calculation beta and alpha.

#### **1.7.4.5 Market Portfolio**

The present study uses S & P CNX Nifty as a surrogate for the market portfolio. The S & P CNX Nifty is a well diversified 50 stock index accounting for 25 sectors of the Indian economy and regarded as a better indicator of the market than any other indices.

### **1.7.5 Variables Used**

#### **1.7.5.1 Abnormal Returns**

When a company announces its buyback program or stock splits, the share price of the company rises beyond the expectations of the market. This unexpected rise in the share

price causes unexpected returns. The difference between unexpected returns (actual returns) and expected returns is technically called as Abnormal Returns.

#### **1.7.5.2 Earnings per Share**

Earnings per Share are earnings per outstanding share of a company. It is one of the tools for measuring the operational efficiency of the organization. The Earnings per share is obtained by dividing earnings of the company by number of outstanding shares during a particular year.

#### **1.7.5.3 Volume of Trading**

Volume of trading means quantity or number of shares traded in a particular day or during a week. The volume of trading generally increases when the scrip is traded within a popular trading range. Therefore, a company normally announces its stock splits when the scrip of the company moves out of the popular trading zone and the volume of trading is affected.

#### **1.7.5.4 Stock Price**

Stock price is a price at which the share of a company is bought and sold in the market. The performance of the company reflects on the share price. Sometimes, the performance and fundamentals of the company are good but the share price does not do well in the market. The company, therefore, announces either stock buyback or stock splits to signal the undervaluation stock and better prospects for the company in the future.

### **1.7.6 Hypotheses**

Hypothesis is a predictive statement. It is a tentative answer to the research problem. Hypothesis is a statement based on the assumption. Therefore, it is to be tested by scientific methods to determine its validity. There are two type's hypothesis viz., null hypothesis and alternative hypothesis. Generally, null hypothesis is symbolized as H<sub>0</sub> and

the alternative hypothesis as H1. The following null and alternative hypotheses have been developed to test the objectives of the study;

**For Objective 2;**

Abnormal Returns (Abnormal Returns Hypothesis)

**Stock Buyback**

H0: AR from BB = 0

H1: AR from BB  $\neq$  0

**Stock Splits**

H0: AR from SS = 0

H1: AR from SS  $\neq$  0

**For Objective 3;**

**1) Earnings per Share (Operational Efficiency Hypothesis)**

H0: EPS after ABB < EPS before ABB

H1: EPS after ABB > EPS before ABB

**2) Volume of Trading (Trading Range Hypothesis)**

H0: VT after ASS < VT before ASS

H1: VT after ASS > VT before ASS

**3) Equity Share Price (Signaling Hypothesis)**

**a) Stock Buyback**

H0: SP after ABB < SP before ABB

H1: SP after ABB > SP before ABB

**b) Stock Splits**

H0: SP after ASS < SP on the day of ASS

H1: SP after ASS > SP on the day of ASS

### 1.7.7 Data Analysis

The following tools and techniques have been employed to analyze the data gathered for the study;

#### 1.7.7.1 Abnormal Returns

The abnormal returns for the company *i* on day *t* are calculated as;

$$AR_{it} = R_{it} - \bar{R}_{it} \quad \text{----- (1)}$$

Where;

$AR_{it}$  --Abnormal returns for the company *i* on day *t*

$R_{it}$  -- Actual returns for the company *i* on day *t*

$\bar{R}_{it}$  --Expected returns for the company *i* on day *t*

#### 1.7.7.2 Returns for the Company

The daily returns for each sample Company for the event window period are computed by;

$$R_{it} = (P_{it} - P_{it-1}) / P_{it-1} \quad \text{----- (2)}$$

Where;

$R_{it}$  -- Actual returns for the company *i* on day *t*

$P_{it}$  -- Share Price of the company *i* at time *t*

$P_{it-1}$  -- Share Price of the company *i* at time *t-1*

#### 1.7.7.3 Expected Returns

The expected returns for the company *i* during the event window period are ascertained by using the following market model (regression);

$$\bar{R}_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad \text{----- (3)}$$

Where,

$\bar{R}_{it}$  -- Expected returns for the company *i* on day *t*

$\alpha_i$  -- Intercept term (alpha) of the company *i*

$\beta_i$  -- Beta (systematic risk component) of the company i

$R_{mt}$  --Returns on the market portfolio on day t

$\varepsilon_{it}$  -- Error term of the company i on day t

#### 1.7.7.4 Returns on the Market portfolio

The daily returns on the market portfolio i.e., for the sample index for the event window and estimation window periods are calculated by;

$$R_{mt} = (I_{it} - I_{it-1}) / I_{it-1} \quad \text{----- (4)}$$

Where;

$R_{mt}$  --Returns on the market portfolio (Index) on day t

$I_{it}$  -- Index value of index i at time t

$I_{it-1}$  --Index value of index i at time t-1

#### 1.7.7.5 Average Abnormal Returns

The Abnormal returns are averaged over the number of sample companies in order to eliminate the effect of any one company or group of companies on the abnormal returns. The abnormal returns of individual companies are averaged for each day, surrounding the event day as;

$$AAR_t = \sum_{i=1}^N \frac{AR_{it}}{N} \quad \text{----- (5)}$$

Where;

$AAR_t$  --- Average abnormal returns for sample companies on day t

$AR_{it}$  --Abnormal returns for the company i on day t

N ---Number of companies in the sample

#### 1.7.7.6 Cumulative Average Abnormal Returns

The Cumulative Average Abnormal Returns (CAARs) are computed with a view to know the cumulative effect of average abnormal returns on the days surrounding the event days,  $t_1$  through  $t_2$  by summing the average abnormal returns for these days as;

$$CAARs_t = \sum_{t=t_1}^{t_2} AARs_t \quad \text{----- (6)}$$

Where;

CAARs<sub>t</sub> -- Cumulative Average Abnormal Returns for sample companies  
on day t

AARs<sub>t</sub> -- Average Abnormal Returns for samples companies on day t

#### 1.7.7.7 Standard Deviation

Standard deviation is a measure of the dispersion. It is denoted by the letter  $\sigma$  (small sigma). It is widely used in the statistical analysis to find out the homogeneity and heterogeneity of the distribution. The following formula is used to calculate the standard deviation;

$$\sigma = \sqrt{\frac{1}{n} \sum (X - \bar{X})^2}$$

Where

$$\bar{X} = \frac{1}{n} \sum X$$

In the present study, the standard deviation has been adopted to compute the t- test values to test the hypotheses.

#### 1.7.7.8 Arithmetic Mean

Arithmetic mean is a measure of the central tendency. It is denoted by  $\bar{X}$ . It indicates a single value within the range of the data that is used to represent all of the values in the series. Arithmetic mean has been widely used to compare one set of data with that of another. The following formula is used to calculate the mean;

$$\bar{X} = \frac{\sum X}{n}$$

Where

$\sum X$  = Sum of the observations

n = Number of observations

The mean, in this study, has been employed for the following;

- i) To eliminate the effect of any one company or group of companies on the abnormal returns.
- ii) To compare the volume of trading after stock splits with the volume of trading before stock splits.
- iii) To compare the stock price after buyback with the stock price before buyback.
- iv) To compare the stock price after stock splits with the stock price on the day of the announcement of stock splits.

#### **1.7.7.9 Percentage Method**

In the present research work, the Percentage method has been used to calculate the percentage of actual returns for the company and on the market portfolio.

#### **1.7.7.10 Alpha Factor**

Alpha factor is a measure of the inherent volatility of a stock. A share with an alpha factor of, say, 0.5 is expected to rise by 50% in a year on its inherent strength regardless of the behavior of the market. In this study, Alpha factor has been adopted for the calculation of the expected returns. The Intercept Method is used for calculation of alpha.

$$\alpha = \text{Intercept } (R_i, R_m)$$

Where

$R_i$  – Returns for Company i

$R_m$  – Returns for Index i (Market Portfolio)

#### **1.7.7.11 Beta Factor**

Beta is a measure of the volatility or systematic risk of a security or a portfolio in comparison with the market as a whole. If a stock has a beta of, say, 1, it means that the rise and fall of the stock price corresponds exactly with the rise and fall of the market. It is

also known as beta co-efficient. Beta factor, in this study has been used for the calculation of the expected returns. Beta is calculated by using the following;

$$\beta = \text{Covariance } (R_i, R_m) / \text{Variance } (R_m)$$

Where

$R_i$  – Returns for Company i

$R_m$  – Returns for Index I (Market Portfolio)

#### 1.7.7.12 Significance Test

The study employs a large sample test statistics for testing the hypotheses at 1% and 5% level of significance. The following steps are followed for working out the large sample test statistics;

1. The standard deviation of abnormal returns for the event window periods is

computed by the following formula;

$$\sigma = \sqrt{\frac{1}{n} \sum (X - \bar{X})^2}$$

Where;

$$\bar{X} = \frac{1}{n} \sum X$$

2. The standardized abnormal returns for each company for the event window

periods is calculated by;

$$SAR_{it} = \frac{AR_d}{\sigma}$$

Where;

$AR_d$  – Abnormal returns for the event window period

3. The t statistics for the day t for the average abnormal returns on securities is calculated as;

$$Z_t = \sum_{i=1}^N \frac{SAR_{it}}{\sqrt{N}}$$

Where;

N – Number of companies in the sample

### **1.7.8 Sampling Techniques and Sample Size**

The sampling techniques are broadly classified in to Judgment sampling, Probability sampling and Mixed sampling. Of the different techniques of sampling, the present study chooses the mixed sampling as it is scientific and provides multiple choices (sub-techniques) to draw the sample.

#### **1.7.8.1 Mixed Sampling**

There are different types of mixed sampling. Some of the widely used in the research studies include simple random sampling, systematic sampling, stratified random sampling and simple cluster sampling. The study selects simple random sampling and systematic sampling techniques to draw the sample for the study.

#### **1.7.8.2 Random Sampling**

Random sampling has been adopted to draw the sample of buyback companies from a group of buyback companies. The random method has been used due to the small size of the year-wise number of buyback companies i.e., population. In addition to this, it also provides the equal chance for each and every buyback company to be selected as a sample buyback company. The sample buyback companies have been selected by using the lot system which is normally followed in the case of simple random sampling.

### **1.7.8.3 Sample Size of Buyback Companies**

As per the SEBI's report on the status of the buyback of shares, 289 buyback programs were announced by the listed companies during 1998-99 to 2012-13. Of which 164 buyback programs were initial buyback programs. The sample of the study consists of 82 initial buyback companies i.e., 50% of the total population of 164 initial buyback companies.

### **1.7.8.4 Systematic Sampling**

Systematic sampling has been employed to select the sample of stock splits from a group of stock splits announced by the listed companies during the period under the study. The random sampling has not been used due to the large size of the population. At the same time, the other methods of mixed sampling cannot be suitably employed due to the nature and type of the data from where the sample will be drawn. The following procedure has been followed to draw the sample of stock splits (companies) under the systematic sampling,

- 1) Stock splits companies are chronologically arranged and serially numbered.
- 2) An interval number '8' has been fixed (dividing the total number of stock splits companies by required number stock splits companies as sample i.e.,  $719 / 90 = 8$ ).
- 3) Every 8th stock splits company from each and every interval has been selected as a sample stock splits company (multiples of 8 i.e., 8, 16, 24, and so on).

### **1.7.8.5 Sample Size of Stock Splits Companies**

The information on the stock splits announced by the listed companies is obtained from the Motilal Oswal data source and cross checked with the Share khan data base. It documents 894 stock splits announced during the period from 1998- 99 to 2012 -13. Of the 894 stock splits, 719 stock splits are initial stock splits. Out of the 719 initial stock

splits, 90 initial stock splits i.e. 12.50% of 719 initial stock splits are drawn as sample stock splits on the basis of the Regular interval selection method.

### **1.7.9 Organization of the Study**

The study has been organized into the following six chapters;

#### **Chapter 1: Introduction;**

The chapter 1 deals with the introduction, nature of the problem, objectives of the study, review of the literature and methodology of the study.

#### **Chapter 2: Review of Literature;**

Chapter 2 reviews the literature on stock buyback and stock splits.

#### **Chapter 3: Trend in Stock Buyback and Stock Splits in India;**

This chapter implies buyback of equity, trend in buyback of equity, stock splits and trend in stock splits in India

#### **Chapter 4: Abnormal Returns from Stock buyback and Stock Splits;**

The abnormal returns from buyback and stock splits announced by the sample buyback and stock splits companies are analyzed and interpreted in the chapter 4.

#### **Chapter 5: Corporate Value Creation through Buyback of Equity and Stock Splits;**

This chapter concentrates on the analyses and interpretation of the earnings per share and stock price of buyback companies in the Section I and the volume of trading and stock price of stock splits companies in the Section II.

#### **Chapter 6: Conclusion;**

The findings, conclusion, suggestions and scope for further research are outlined in the chapter 6.

### **1.7.10 Limitations of the Study**

The following are limitations of the study;

- 1) The study concentrates only on the initial buyback and stock splits announcements. It does not consider subsequent buyback and stock splits announcements and reverse stock splits announcements.
- 2) The sample size of 82 buyback announcements and 90 stock splits announcements have been restricted to 64 announcements for abnormal returns analysis, 71 announcements for earnings per share analysis and 62 announcements for stock price analysis and 86 announcements for abnormal returns, volume of trading and stock price analyses due to the non availability of the requisite data for some companies for the analysis respectively.
- 3) The present study uses basic earnings per share rather than the diluted earnings per share for earnings per share analysis as there was no difference between basic and diluted earnings per share of most of the companies.
- 4) The study ignores the stock price before the stock splits announcement from the stock price analysis of the stock splits companies as the stock price is adjusted according to the stock splits factor after the stock splits announcement. However, it is considered for the abnormal returns analysis as the study considers the percentage of returns for the analysis rather than the price.

## Sample Size of Buyback Companies

| Sr. No. | Name of the Company              | Industry                           | Announcement of Buyback |
|---------|----------------------------------|------------------------------------|-------------------------|
| 1       | Addi Industries Ltd.             | Textiles                           | 14/11/2002              |
| 2       | Alembic Automobile Ltd.          | Auto Ancillary                     | 24/11/2008              |
| 3       | Allcargo Logistics Ltd.          | Miscellaneous                      | 26/06/2012              |
| 4       | Allied Digital Services Ltd.     | Computer Software                  | 11/04/2011              |
| 5       | Amtek Automobile Ltd.            | Auto Ancillary                     | 24/11/2011              |
| 6       | Balrampur Chini Mills Ltd.       | Sugar                              | 01/03/2011              |
| 7       | Bhagyanagar Metals Ltd.          | Cables -Telephone                  | 25/06/1999              |
| 8       | Binani Metals Ltd.               | Miscellaneous                      | 23/12/2008              |
| 9       | Blue Star Ltd.                   | Air Conditioning                   | 15/02/2002              |
| 10      | Bright Bros Ltd.                 | Plastic and Plastic Products       | 29/12/2009              |
| 11      | Britannia Industries Ltd.        | Food Processing                    | 10/09/2001              |
| 12      | Dailchi Karkaria Ltd.            | Chemicals-Specialty- Others        | 25/05/2009              |
| 13      | DLF Ltd.                         | Construction                       | 17/10/2008              |
| 14      | ECE Industries Ltd.              | Electronic Equipments - General    | 24/02/2003              |
| 15      | Eicher Motors Ltd.               | Automobile – LCV & HCV             | 06/02/2009              |
| 16      | EID Parry ( India ) Ltd.         | Sugar                              | 15/12/2008              |
| 17      | Entertainment Network India Ltd. | Entertainment /Multimedia Software | 15/02/2006              |
| 18      | ETC Networks Ltd                 | Entertainment Multimedia           | 16/05/2005              |
| 19      | FDC Ltd.                         | Pharmaceuticals                    | 26/10/2001              |
| 20      | Fine Line Circuits Ltd.          | Electronic- equipments/components  | 02/06/2003              |
| 21      | G C Ventures Ltd.                | Pesticides – Agro Chemicals        | 22/02/2010              |
| 22      | Gandhi Special Tubes Ltd.        | Steel - Tubes                      | 05/09/2000              |
| 23      | Gateway Distriparks Ltd.         | Miscellaneous                      | 11/08/2008              |
| 24      | Gemini Communication Ltd.        | Telecommunication – Equipments     | 11/11/2011              |
| 25      | Geodesic Ltd.                    | Computer Software                  | 19/05/2010              |
| 26      | Godavari Power and Ispat Ltd.    | Steel – Sponge Iron                | 03/11/2008              |
| 27      | Godrej Consumer Products Ltd.    | Personal Care                      | 21/01/2002              |
| 28      | Godrej Industries Ltd.           | Chemicals                          | 25/05/2009              |

|    |                                 |                                    |            |
|----|---------------------------------|------------------------------------|------------|
| 29 | Goldiam International Ltd.      | Diamond Cutting/Precious Metals    | 22/11/1999 |
| 30 | Great Offshore Ltd.             | Shipping                           | 07/05/2008 |
| 31 | GTL Ltd.                        | Telecommunication - equipment      | 10/08/2007 |
| 32 | Gujarat Petrosynthese Ltd.      | Petro Chemicals                    | 26/02/2010 |
| 33 | HEG Ltd.                        | Electrodes - Graphite's            | 25/03/2011 |
| 34 | Heritage Food ( India ) Ltd.    | Food Processing                    | 24/01/2002 |
| 35 | Hindalco Industries Ltd.        | Aluminium Products                 | 08/02/2002 |
| 36 | Hindustan Composites Ltd.       | Automobile                         | 28/01/2011 |
| 37 | Hindustan Unilever Ltd.         | Personal Care                      | 03/10/2007 |
| 38 | Hydro S and S Industries Ltd.   | Plastic and Plastic Products       | 26/02/2009 |
| 39 | ICI India Ltd.                  | Paints – Varnishes                 | 18/07/2006 |
| 40 | India Forge and Stampings Ltd.  | Forgings                           | 02/11/2004 |
| 41 | India Nippon Electricals Ltd.   | Auto Electrical                    | 25/06/2001 |
| 42 | Infinite Computer Sol. (I) Ltd. | Computer Software                  | 19/12/2011 |
| 43 | International Conveyors Ltd.    | Miscellaneous                      | 25/02/2004 |
| 44 | IPCA Laboratories Ltd.          | Pharmaceuticals                    | 26/11/2008 |
| 45 | ITW Signode India Ltd.          | Packaging-Metallic/ Plastic/Others | 15/04/2002 |
| 46 | IVP Ltd.                        | Edible Oil and Solvent Extraction  | 02/04/2002 |
| 47 | J K Lakshmi Cement Ltd.         | Cement                             | 15/02/2012 |
| 48 | Kale Consultants Ltd (Accelya)  | Computer software                  | 06/02/2012 |
| 49 | KRBL Ltd.                       | Commodities – Trading Rice         | 18/02/2013 |
| 50 | LKP Finance Ltd.                | Finance and Investment             | 24/02/2009 |
| 51 | Maestros Medline Systems Ltd.   | Medical Equipment and Accessories  | 11/11/2008 |
| 52 | Manugraph Industries Ltd.       | Engineering – General              | 15/10/2001 |
| 53 | Mastek Ltd.                     | Computer Software                  | 27/05/2004 |
| 54 | Mazda India Ltd.                | Engineering – General              | 24/07/2003 |
| 55 | Merck Ltd.                      | Pharmaceuticals                    | 01/06/2009 |
| 56 | Monnet Ispat and Energy Ltd.    | Steel – Sponge Iron                | 21/11/2008 |
| 57 | Natco Pharma Ltd.               | Pharmaceuticals                    | 06/09/2006 |
| 58 | OCL India Ltd.                  | Cement                             | 08/10/2001 |
| 59 | Onmobile Global Ltd.            | Telecom – Service Provider         | 05/09/2011 |

|    |                                   |                                      |            |
|----|-----------------------------------|--------------------------------------|------------|
| 60 | Panama Petrochem Ltd.             | Chemicals Speciality /Others         | 07/03/2013 |
| 61 | Pennar Industries Ltd.            | Steel - CR/HR Strips                 | 14/09/2009 |
| 62 | Phillips India Ltd.               | Consumer Goods - Electronic          | 10/10/2000 |
| 63 | Piramal Health Care Ltd.          | Pharmaceuticals                      | 10/12/2010 |
| 64 | Poddar Pigm Ltd.                  | Dyes and Pigments                    | 16/10/2009 |
| 65 | Polaris Software Lab. Ltd.        | Computer Software – Large            | 24/05/2005 |
| 66 | Prime Securities Ltd.             | Finance and Investment               | 30/06/2005 |
| 67 | Rain Commodities Ltd.             | Cement                               | 25/09/2008 |
| 68 | Reliance Energy Ltd.              | Power Generation and Supply          | 21/09/2004 |
| 69 | Reliance Industries Ltd.          | Diversified – Refineries             | 02/08/2000 |
| 70 | Reliance Infrastructure Ltd.      | Power Generation and Supply          | 25/02/2009 |
| 71 | Sandesh Ltd.                      | Printing, Publication and Stationery | 16/04/2009 |
| 72 | Sasken Com. Technology Ltd.       | Computer Software                    | 22/04/2008 |
| 73 | Selan Exploration Techno. Ltd.    | Oil Drilling and Exploration         | 08/03/2000 |
| 74 | Sirpur Paper Ltd.                 | Paper and Paper Products             | 09/08/2002 |
| 75 | SRF Polymers Ltd.                 | Textiles – Manmade                   | 13/12/2005 |
| 76 | Tips Industries Ltd.              | Entertainment and Multi Media        | 30/08/2010 |
| 77 | TTK Health Care Ltd.              | Pharmaceuticals                      | 25/02/2009 |
| 78 | Tube Investment of India Ltd.     | Cycles and Accessories               | 09/12/2002 |
| 79 | United Phosphorus Ltd.            | Pesticides and Agro Chemicals        | 11/05/2012 |
| 80 | Venky's (India) Ltd.              | Livestock, Hatcheries and Poultry    | 19/09/2002 |
| 81 | Winsome Yarns Ltd.                | Textiles – Spinning                  | 20/08/2001 |
| 82 | Zee Entertainment Enterprise Ltd. | Entertainment –Multimedia software   | 13/04/2012 |

## Sample Size of Stock Splits Companies

| Sr.No. | Name of Company                       | Industry                     | Announcement of Stock Splits |
|--------|---------------------------------------|------------------------------|------------------------------|
| 1      | Aarya Global Shares & Securities Ltd. | Textile -General             | 23/09/2010                   |
| 2      | Anant Raj Ltd.                        | Construction & contracting   | 08/10/2007                   |
| 3      | Anukaran Commercial Enterprises Ltd.  | Trading                      | 27/12/2012                   |
| 4      | Asahi Infrastructure & Projects Ltd.  | Construction & contracting   | 04/07/2005                   |
| 5      | Astrazeneca Pharma India Ltd.         | Pharmaceuticals              | 15/06/2006                   |
| 6      | Bajaj Electricals Ltd.                | Domestic Appliances          | 28/01/2010                   |
| 7      | Bajaj Hindustan Ltd.                  | Sugar                        | 28/04/2004                   |
| 8      | Banco Products (India) Ltd.           | Auto Ancillary               | 23/11/2007                   |
| 9      | Bayer Crop science Ltd.               | Pesticides - Agro Chemicals  | 24/11/2003                   |
| 10     | Bharat Heavy Electricals Ltd.         | Engineering-Heavy            | 03/10/2011                   |
| 11     | Bharti Airtel Ltd.                    | Telecommunications - Service | 24/07/2009                   |
| 12     | BLS InfoTech Ltd.                     | Computer Software            | 28/09/2005                   |
| 13     | Bombay Burmah Trading Corp. Ltd.      | Plantations-Tea & Coffee     | 08/11/2012                   |
| 14     | Carborundum Universal Ltd.            | Abrasives & Grinding wheels  | 16/08/2004                   |
| 15     | Century Ply boards (India) Ltd.       | Decorative –wood based       | 24/04/2008                   |
| 16     | CHD Developers Ltd.                   | Construction & contracting   | 26/10/2005                   |
| 17     | Chemfab Alkalis Ltd.                  | Chemicals-Inorganic          | 20/09/2005                   |
| 18     | Core Education & Technologies Ltd.    | Computer Software training   | 06/06/2007                   |
| 19     | Dhenu Buildcon India Ltd.             | Finance & Investment         | 25/06/2001                   |
| 20     | Diamant Infrastructre Ltd.            | Construction & contracting   | 07/10/2010                   |
| 21     | Diana Tea Company Ltd.                | Plantations-Tea& Coffee      | 13/06/2005                   |
| 22     | Divis Laboratories Ltd.               | Pharmaceuticals              | 03/08/2007                   |
| 23     | DJS Stock and Shares Ltd.             | Finance & Investment         | 23/10/2012                   |
| 24     | DSJ Communication Ltd.                | Printing & Stationary        | 10/09/2001                   |
| 25     | Dynacons Systems & Solutions Ltd.     | Computer - Software          | 19/09/2002                   |
| 26     | Eastern Silk Industries Ltd.          | Textiles-Synthetic/Silk      | 27/06/2008                   |
| 27     | Electro steel Castings Ltd.           | Castings/Foundry             | 17/09/2007                   |
| 28     | Emami Ltd.                            | Personal care                | 16/02/2004                   |

|    |                                      |                                  |            |
|----|--------------------------------------|----------------------------------|------------|
| 29 | Emco Ltd.                            | Electric Equip. - Transformer    | 14/03/2008 |
| 30 | Exelom Infrastructure Ltd.           | Construction & contracting       | 24/03/2011 |
| 31 | Frontline Business Solutions Ltd.    | IT enabled services              | 31/01/2013 |
| 32 | Gabriel India Ltd.                   | Auto Ancillary-shock absorbers   | 30/12/2005 |
| 33 | Gammon India Ltd.                    | Construction & contracting       | 15/03/2005 |
| 34 | Gammon Infrastructure Projects Ltd.  | Infrastructure-General           | 26/10/2009 |
| 35 | Gangotri Iron & Steel Ltd.           | Steel -Rolling                   | 29/10/2010 |
| 36 | Gati Ltd.                            | Couriers                         | 21/03/2006 |
| 37 | Graphite India Ltd.                  | Electrodes- Graphite             | 11/12/2006 |
| 38 | GRUH Finance Ltd.                    | Finance/ Housing                 | 24/07/2012 |
| 39 | HDFC Bank Ltd.                       | Finance - Bank                   | 14/07/2011 |
| 40 | Hero Motor corp Ltd.                 | Automobile                       | 12/03/2001 |
| 41 | Hexaware Technologies Ltd.           | Computer/ Software               | 28/04/2005 |
| 42 | Hindustan National Glass & Ind. Ltd. | Glass & Glass products           | 12/11/2009 |
| 43 | Hotel Leela Venture Ltd.             | Hotels, Resorts & Restaurants    | 08/09/2006 |
| 44 | ICSA (India) Ltd.                    | Computer Software                | 23/10/2007 |
| 45 | Indoco Remedies Ltd.                 | Pharmaceutical                   | 17/05/2012 |
| 46 | Jaipan Industries Ltd.               | Domestic Appliances              | 02/11/2005 |
| 47 | Jenson & Nicholson Ltd.              | Paints - Varnishes               | 04/12/2000 |
| 48 | Jindal Saw Ltd.                      | Steel- Tubes & Pipes             | 10/12/2009 |
| 49 | JMDE Packaging Realities Ltd.        | Packaging-metallic/Plastic/other | 26/02/2010 |
| 50 | JVL Agro Industries Ltd.             | Edible oils & solvent extraction | 09/11/2010 |
| 51 | KCP Ltd.                             | Cement                           | 02/09/2010 |
| 52 | KEC International Ltd.               | Power/ transmission              | 30/12/2010 |
| 53 | Kedia Infotech Ltd.                  | Computer software                | 26/08/2005 |
| 54 | KENNAMETAL                           | Engineering -General             | 18/09/2000 |
| 55 | Koffee Break Pictures Ltd.           | Entertainment/ Multimedia        | 08/12/2008 |
| 56 | Kokuyo Camlin Ltd.                   | Diversified                      | 22/08/2008 |
| 57 | Kolar Biotech Ltd.                   | Computer software                | 13/02/2002 |
| 58 | KPIT Technologies Ltd.               | Computer - Software              | 03/03/2005 |
| 59 | Kulkarni Power Tools Ltd.            | Engineering -General             | 14/02/2008 |

|    |                                     |                             |            |
|----|-------------------------------------|-----------------------------|------------|
| 60 | Lahoti Overseas Ltd.                | Trading                     | 12/08/2005 |
| 61 | Maharashtra Polybutenes Ltd.        | Chemicals-Organic/Others    | 14/11/2011 |
| 62 | Mercator Ltd.                       | Diversified                 | 24/01/2005 |
| 63 | Minal Industries Ltd.               | Trading                     | 02/06/2011 |
| 64 | Minaxi Textiles Ltd.                | Textiles/processing         | 21/03/2007 |
| 65 | Mindvision Capital Ltd.             | Finance & Investment        | 21/07/2005 |
| 66 | Mobile Telecommunications Ltd.      | Telecomm.- Equipment        | 31/10/2008 |
| 67 | Motherson Sumi Systems Ltd.         | Auto Ancillary-electrical   | 21/10/2002 |
| 68 | National Peroxide Ltd.              | Chemicals - Inorganic       | 26/05/2006 |
| 69 | Oil & Natural Gas Corporation Ltd.  | Oil drilling & exploration  | 08/02/2011 |
| 70 | Paramount Communications Ltd.       | Cables-Telephone            | 25/01/2007 |
| 71 | Phoenix Mills Ltd.                  | Textiles - Mills            | 09/12/2005 |
| 72 | Rainbow Papers Ltd.                 | Paper & Paper products      | 11/08/2010 |
| 73 | Ramco Cements Ltd.                  | Cement                      | 01/10/2008 |
| 74 | Religare Technova Global Sol. Ltd.  | Computers/Software          | 15/02/2006 |
| 75 | Sarang Chemicals Ltd.               | Chemicals - Inorganic       | 17/03/2009 |
| 76 | Shalimar Productions Ltd.           | Trading                     | 03/07/2003 |
| 77 | Suzlon Energy Ltd.                  | Engineering-Heavy           | 21/01/2008 |
| 78 | Swan Energy Ltd.                    | Construction & contracting  | 13/10/2006 |
| 79 | Swasti Vinayaka Art & Heritage Ltd. | Finance & Investment        | 21/10/2005 |
| 80 | Symphony Ltd.                       | Domestic appliances         | 15/02/2012 |
| 81 | Tata Global beverages Ltd.          | Plantation - Tea & Coffee   | 30/06/2010 |
| 82 | TVS Motor Company Ltd.              | Auto-2 and 3 Wheeler        | 18/12/2003 |
| 83 | Ultramarine & Pigments Ltd.         | Dyes & Pigments             | 10/10/2005 |
| 84 | Unity Infraprojects Ltd.            | Infrastructure-General      | 07/04/2010 |
| 85 | Venus Universal Ltd.                | Computer - Software         | 23/01/2003 |
| 86 | Walchand Peoplefirst Ltd.           | Finance & Investment        | 30/08/2011 |
| 87 | Winsome Textile Industries Ltd.     | Textiles-spinning synthetic | 24/09/2009 |
| 88 | Wipro                               | Computer Software           | 27/09/1999 |
| 89 | Zenith Healthcare Ltd.              | Pharmaceutical              | 28/10/2005 |
| 90 | Zyden Gentec Ltd.                   | Pharmaceutical              | 27/08/2009 |

CHAPTER 2  
**REVIEW OF LITERATURE**

## REVIEW OF LITERATURE

The stock buyback and stock splits are major financial strategies generally adopted for creating the value for the shareholders. They are inversely related but both of them create the value for the shareholders. The buyback of shares creates the value through abnormal returns and increase in the earnings per share and the stock price while the stock splits enhance the value of the shareholders by abnormal returns and increase in the volume trading and the stock price. Therefore, the stock buyback and the stock splits have become significant areas of research. Hence, a large number of research studies have been carried out on buyback of equity and stock splits in India and around the world.

Most of the research scholars have employed the event study methodology and market model in order to ascertain and establish the relationship between stock buyback and stock splits events and the corporate value creation. Some scholars have worked on the market reaction to the buyback of shares and stock splits ( Masulis, R.,1980, vermaelen, 1981) while the others have examined the impact of buyback on earnings per share (Mishra, A. K, 2005) and stock splits on volume of trading ( Isil Sevilay Yilmaz, **2003**).

Similarly, the present study focuses its attention on the corporate value creation through abnormal returns and increase in the earnings per share, volume of trading and stock price. Therefore, this study, in this chapter, makes an attempt to review the existing literature on buyback of shares and stock splits in India and around the world. However, on the basis of the objectives of the study, the segregation of the existing literature is not possible as most of the scholars have worked on more than one hypothesis. The existing literature on stock buyback and stock splits related to the objectives of the study is reviewed in the following pages;

## **2.1 Review of Literature on Buyback of Shares**

The literature on the buyback of shares has been reviewed chronologically in the following;

**Young (1967)** analyzed 152 tender offers of companies listed on US stock exchanges during 1944 to 1965. He compared the mean of common stock experiencing tender offer with that of S & P's 500 companies stock index four times i.e., on the day of announcement, after three months, after six months and one year after the announcement. He found that the subsequent price action of the common stocks for which tender offers have been issued were significantly less favorable than the general market for equity securities during this time.

**Stewart, Jr. (1976)** examined the effectiveness of repurchase decisions by comparing the price performing index of 5591 repurchasing firms during the period 1954 to 1973 and found that the stock market performance of repurchasing firms is generally superior to that of non-purchasing firms but clear superiority does not emerge until several years after repurchase.

**Dielman, Nantell and Wright (1980)** studied the stock behavior of 174 repurchases of 139 firms during 1957 to 1974 by way of open market and through tender offer. They employed regression model and found that i) open market repurchases have no economic significance i.e., repurchase effects on rates of return are uniformly negligible and in respect of tender offer, repurchase is associated with significant increase in return in the month of announcement and ii) announcing a buyback is announcing to the market that the firm has run out of profitable investment opportunities. This implies a negative relationship between buyback and stock price.

**Masulis R (1980)** analyzed 199 tender offers for stocks listed on the NYSE and ASE for the period between 1963 to 1978 by employing comparison period research approach and found that i) announcement period generates 17% return much higher than pre-announcement period of 40 days and ii) there is no announcement day price effect.

**Dann (1981)** found that the share buyback led to shareholders experiencing positive share returns approximately 15%. These positive returns were mostly permanent in the share price. They did not return to their pre-buyback date levels.

**Vermaelen (1981)** studied 131 tender offer announcements during the years 1962 to 1977. He found that i) on an average, the studies in the US and other nations document event returns of 2.5% to 3%, ii) the abnormal returns increase when the managers have greater stake in the announced portion of the outstanding equity shares to be purchased, iii) repurchases are used as mechanism to correct market mispricing, iv) unless the percentage of shares tendered by the share holders is exactly equal to the percentage of shares purchased by the company, the expected price to prevail after the buyback will always be lower than the offer price, v) it will be incorrect to use share price increase after the announcement as a measure of the value change per share resulting from the tender offer, vi) signaling effect can explain most of the value increase due to buyback in the US i.e., evidence of about 16% value increase after share buyback in the US and vii) debt financed buybacks have got a higher impact on the stock price (24%) as compared to cash financed buybacks(18%) in the US.

**Lakonishok and Vermaelen (1990)** analyzed 258 repurchase tender offers during 1962 to 1986 by firms traded on NYSE, AMEX and OTC and indicated that i) it was possible to generate abnormal returns of more than 9% in a period of less than one week

by following a trading strategy of buying shares after the repurchase announcement and tendering it to the firms before the expiration date, ii) repurchasing companies experience statistically significant abnormal returns in two years after the buyback and iii) signaling effect is generally believed to be stronger for small companies due to the fact that they are more likely to receive less attention from market analysts and therefore the chances are that they are more likely to remain under priced.

**Persons (1994)** developed a model of managerial choice between fixed price tender offer and Dutch auction repurchases. He tested the model empirically for the companies making fixed price offer and Dutch auctions between the years 1980-92 and found that the fixed price offers increased the market value of the firm because they signal high firm value and Dutch auctions are better takeover deterrents.

**Neena Puri (2001)** analyzed 14 buyback programs announced by the listed companies in India from 1999 to 2001. She found that only 2 out of the 14 companies which came up with buyback offers have been successful in having the desired effect of achieving superior share price performance and returns for the shareholders. She concludes that the result of the study goes against the commonly held belief that the buyback of shares is accompanied by an increase in the share price.

**Pettit (2001)** says that the buyback creates value in two ways. Firstly, the buyback announcement, its terms and the way it is implemented, all convey signals about the company's prospects and plans. Secondly, if financed through debt, it changes the capital structure and gives leverage effect.

**Madan Mohan Maji and Dhananjay Rakshit (2002)** studied buybacks of 14 companies during the year 2001-2002. They demonstrated that 9 out of 14 buybacks were for the consolidation of holdings by the existing promoters. They further stated that by adopting repeated deals of share repurchase programs the reputed companies, either after completion of the buyback of the entire non-promoters holdings or after raising the promoters holdings above 90% are moving towards delisting the shares from the stock exchanges.

**Pitabas Mohanty (2002)** analyzed share buyback of 12 companies during the period from 1999 to 2001. He used Event Study Methodology, 61 days window period and 24 months sample period to find out the market reaction to the buyback announcement. He finds i) cumulative abnormal returns of 11.25% for a 61 days window period, ii) cumulative abnormal returns of 3.86% on announcement day and iii) gain at about 24%, on an average, (non-annualized) for an ordinary investor. The study concludes that i) stock prices do move up because of the high offer premium only to fall back to their original level, ii) buyback does not result in any perceptible long run increase in the value and iii) evidence of insider trading before the share buyback is announced.

**Kai Li and William McNally (2003)** analyzed 329 repurchases during the period 1989 to 1992. They used conditional event study methodology to examine whether role of insider holdings affects the decision to announce repurchase and associated announcement period stock returns. They find that i) repurchases are more likely from firms where insiders have large share holdings, ii) repurchasing firms have greater free cash flow and tend to have experienced a stock price decline prior to the announcement and iii) announcement returns are larger for firms where insiders have greater insider holdings, larger for small firms and larger for firms with greater free cash flow.

**Karamjeet Kaur and Balwinder Singh (2003)** analyzed 77 buyback programs announced by 60 companies during 1999-2003. They used comparison period returns approach to study the response of the stock market to the announcement of buyback programs. They found that the buyback announcements are associated with positive returns considering the stock markets to be fairly efficient. This can be attributed to informational asymmetries between managers and investors. The study concludes that the companies are able to successfully achieve their motive of correcting the undervaluation of stock and signaling their future prospects.

**A.K. Mishra (2005)** studied 25 buyback programs by different companies over the period from 1999-2001. He finds a favorable reaction around the announcement date. He concludes that i) stock price reaction to buyback is temporary and buybacks could not ensure a sustained rise in the price of the scrip, ii) there is no favorable effect of buyback on EPS as out of total 25 companies only 11 companies registered enhancement in the EPS and iii) buyback price has no correlation with the fair valuation of the share.

**Amitabh Gupta (2006)** examined 46 buyback of shares made by listed companies during the period 1999-2004. He employed the Standard Event Study Methodology to calculate AARs and CARs around the buyback announcements and z statistics for testing cumulative excess returns. He finds an announcement day AARs of 1.67% and AARs of 11.82% and CARs of 12.69% for 61 days window period. He concluded that i) announcement of share buyback significantly increases the share price around the time of the announcement, ii) AARs of companies which have come out with a subsequent repurchase program is smaller than the AARs of their previous buyback program, iii) large companies generate lower abnormal returns than small companies because of low information asymmetry between the management and the investors of large companies

and iv) AARs do not increase with the increase in proportion of shares to be bought back as investors do not perceive an increase in proportion of shares as a positive signal.

**Tanupa Chakraborty (2008)** analyzed buyback of shares by 6 listed public limited Indian companies between the period from 1998 to 2001. She has tested seven hypotheses and found that i) tendering shareholders have gained more than non-tendering shareholders, ii) buyback does not favorably influence the share price and iii) buyback does not enhance shareholder value. The study concluded that the market reaction to news is not always completed over a short period of time but the full impact of corporate announcements can extend over several years.

**R.L. Hyderabad (2009)** studied 70 buyback announcements for the period from 1999 to 2007. He employed market model to examine the excess returns on the announcement of share buyback and t-test and z-test values for judging the significance of daily average returns. Besides the over-all analysis of returns from buyback announcements, he also studied method-wise announcement returns. The study finds that i) significant announcement day AARs of 2.77% and CARs of 7.91% and ii) over-all CARs of 7.24% for a 41 day window period. He concluded that i) result of the study contradicts the prediction of signaling hypothesis and ii) Fixed price tender offer yields higher announcement returns than the open market repurchase in the Indian context.

**Lars Manor Paulsen (2011)** analyzed 113 open market repurchases by Danish companies between 2000 and 2010. He used absolute and relative returns approach. His analysis showed that more than half of the buyback in the sample had a negative absolute returns of -1.5%, -0.8%, -7.8% and -21.6 in the 1st, 2nd, 3rd, and 4th years respectively. Similarly, more than half of the buyback had negative relative returns in all the periods.

He further stated that the relative returns was in general lower than the absolute returns indicating that the negative absolute returns was not due to a general development in the market. The study concluded that the share buyback in general does not create value for shareholders as both the absolute and relative returns are negative.

**Pournima Jariwala (2011)** examined buyback of 82 companies through open market repurchase in India over the period from 2000 to 2009.. She employed Mean price to study the movement of the stock price and Ratio analysis to measure the operating performance before and after the announcement of buyback. She found that i) share price, generally, on an average, react positively to buyback announcement, ii) share buyback signals increase in the operating efficiency in the future and iii) stock buyback creates value for shareholders. She concluded that there should be strict regulations disallowing the companies to make the fresh issue of shares at least for one year after buyback and thereby to avoid manipulation in the share price.

## **2.2 Review of Literature on Stock Splits**

The literature on the stock splits has been enumerated one by one in the following;

**Maureen McNichols and Ajay Dravid (1990)** analyzed stock splits and dividends which occurred from 1976-1983. They examined the effect of split factor on the amount of returns around the announcement date. They employed event study methodology and tested the signaling hypothesis. The study found that the investors' presumptions about firms future earnings corresponded with the managers split factor choice.

**Robert Conroy and Robert Harris (1999)** investigated 5264 stock splits by over 200 NYSE firms from 1925 to 1996. They studied a three day cumulative abnormal returns centered on the splits announcement day and also conducted a supplementary test of splits effect by looking at changes in analysts forecast of earnings per share before and after the announcement date. They found that the market values of the stocks increased significantly around splits announcement dates and also analyst earnings forecast increase significantly when the split factor was higher than anticipated.

**Anttinini (2000)** examined 18 stock splits announcements for Finnish companies and 90 stock splits announcements for Swedish companies to investigate whether shareholder wealth effect exists around the announcement and execution dates of stock splits at the Helsinki and Stockholm stock exchanges from 1985 to 1997. He concluded that there exists statistically significant abnormal returns surrounding the announcement day on both the Finnish and Swedish markets and the statistically significant abnormal returns were also found around the execution date of the stock splits at the Stockholm Stock Exchange but not at Helsinki Stock Exchange.

**Wulff (2002)** analyzed 78 stock splits for examining the announcement day effect and 83 stock splits for assessing the execution date effect by firms listed on the Frankfurt stock exchange from 1994 to 1996. He used the event study methodology with the estimation period of over 200 days and the event window of 61 days. He found statistically significant abnormal returns around both the announcement and execution days for German stock splits. However, the abnormal returns found in the study were consistently much lower than studies conducted on the American data. He stated that the difference is due to the legal restrictions on German companies to use stock splits for signaling.

**Isil Sevilay Yilmaz (2003)** examined 167 stock splits events executed by 60 financial firms and 573 stock splits events executed by 203 non financial firms during the period from 1992 to 2002. He tested the trading range liquidity hypothesis. The empirical findings about the level of liquidity indicated that the trading volume of a stock and its liquidity is slightly lower following the stock splits. The liquidity is found to decrease by a small amount after the splits. The study also found that the firm's size has positive effect on the share price.

**Chhavi Mehta (2007)** surveyed 539 stock splits by 517 companies over a period from 1999 to 2007. He used survey questionnaire method to investigate Indian managers' opinion about stock splits and their motives for issuing them. The empirical findings of the survey reveal that the management views stock splits as a tool that enhances liquidity and major motive for issuing stock splits in India is to improve liquidity of a firm's shares to bring down the share price to a popular trading range and to attract the new investors.

**Satyajit Dhar and Sweta Chhaochharia (2007)** analyzed 90 stock splits and 82 bonus issues announced by companies listed on the BSE from 2001 to 2007. The study used the event study methodology to examine the market reaction to stock splits and bonus issues by considering event window of -40 to +40 days relative to the event day. They found positive AARs of 1.8% in respect of bonus issues and 0.8% in the case of stock splits. They concluded that bonus issues result in sharp spike on the announcement date while stock splits announcements are resulting in positive returns during the entire event window although effect on announcement date is not that sharp.

**George Roji (2009)** studied the average dividend rate and payout ratio of pre share splits and post share splits of 146 companies from 2000 to 2005. The findings of the study reveal that there is significant difference between the pre dividend and the post dividend percentage and there is no significant difference between the pre payout ratio and the post payout ratio. It also found that the profitability of the firms improved after stock splits which support the signaling theory on information asymmetry. The study concluded that share splits enhance the wealth of shareholders by way of enhanced dividends.

**Leledakis, Pa-pioannou, Trav-los, and Tsangarakis (2009)** examined 89 stock splits issued in the Athens Stock Exchange. The study used standard event study methodology with the estimation period of 100 days and the event period of 21 days i.e., -10 through +10 to study the effect of stock splits announcement on the abnormal returns. The study found that there is a positive abnormal returns (positive price reaction) around the announcement date.

**Yague, Gomez-Sala and Poveda-Funtas (2009)** investigated 45 stock splits issued by Spanish companies from 1997 to 2005. In addition to the usual reaction of investors to the stock splits, they studied whether the financial analysts consider the stock splits to be a positive signal from the management. The results of the study indicated that professional analysts considered stock splits as a signal of favorable information to the market.

**Josiah Omollo Aduda and Chemarum Caroline S.C. (2010)** analyzed stock splits from 9 companies during the period 2002 to 2008. They used the trading activity ratio and the event window of 101 days consisting of 50 days before and 50 days after the stock splits. The event study methodology was employed to determine the effect of stock

splits. The abnormal returns were calculated by using the market model and t-tests were conducted to test the significance. The study found that the Kenyan Stock Market reacts positively to stock splits as shown by a general increase in the volumes of shares traded around the stock splits. The study equally found that there were positive average abnormal returns and cumulative abnormal returns across the different event windows on the stock splits date and on days around the stock splits.

**Mikko Reinikainen (2010)** examined 38 stock splits by 31 Finnish listed companies during the time period from 1996 to 2007. He employed Standard event study methodology to examine whether the announcements of stock splits have caused abnormal behavior in the stock returns on the announcement dates. He found that the pure stock splits announcements do not cause any statistically significant abnormal behavior on the stocks around the announcement day and the event does not seem to induce pre or post announcement drifts. He concluded that the study did not find any evidence of the signaling effect of stock splits present in the Finnish stock markets during the period from 1996 to 2007.

**Koustubh Kanti Ray (2011)** studied 351 stock splits and 177 rights issues announced by the companies listed on the NSE from 1996 to 2008. He employed market model (Brown & Warner) to compute the abnormal returns. He considered the event window of 61 days consisting of – 30 to + 30 relative to the event day. He found positive AARs of 2.4% for stock splits and 1% for rights issues on event announcement date. In addition, in the case of liquidity, he also found that the announcement of stock splits increased the liquidity as the affordability level of Indian investors increase due to stock splits but for rights issues there is no evidence for change in the liquidity in pre and post event period.

## 2.3 Research Gap

The literature on stock buyback and stock splits indicates that a majority of the research scholars have conducted the event studies and examined a number of hypotheses to obtain empirical evidences to establish their opinion on the effects of buyback and stock splits announcements on the stock price. The hypotheses tested so far on buyback and stock splits include ‘signaling’, ‘leverage effect’, ‘consolidation of holdings’ and ‘liquidity’. Of these, signaling and liquidity hypotheses are widely tested hypotheses by the research scholars both in India and around the world.

The empirical studies in the past have examined signaling and liquidity hypotheses to identify the effects of stock buyback and stock splits on the stock price for a maximum window period of 61 days, i.e., 30 days before and 30 days after the event day except Young (1967) who compared the mean of common stock experiencing tender offer with that of S & P’s 500 companies stock index four times i. e., on the day of announcement, after three months, after six months and one year after the announcement. These studies found a positive price reaction on and around the announcement day of buyback and stock splits and increase in the volume of trading after the stock splits as the affordability level of investors goes up after the stock splits.

From the above discussion, it is clear that the signaling and liquidity hypotheses have been widely tested to identify the signaling and liquidity effects of stock buyback and stock splits for a maximum period of 61 days approximately for a short duration of 30 trading days. However, a very few empirical studies have been conducted to identify the effects of stock buyback and stock splits on the stock price and volume of trading in the long run. Moreover, there are in fact a few studies carried out to ascertain the effects of buyback on

earnings per share and the effects of stock buyback and stock splits on the share holder value creation.

The present study therefore adopts signaling and liquidity hypotheses under the investigation. It makes an attempt to ascertain the effects of stock buyback and stock splits announcements on the stock price both in short run and long run in the Indian context. It further examines the impact of stock buyback and stock splits announcements on the shareholder value creation to contribute and fill up the research gap in the literature on the subject.

CHAPTER – 3

**TREND IN STOCK BUYBACK AND  
STOCK SPLITS IN INDIA**

# **TREND IN STOCK BUYBACK AND STOCK SPLITS IN INDIA**

## **3.1 Buyback of Shares in India**

Buyback of equity shares was prohibited in India by the Companies Act, 1956. The reason was it may give rise to the possibilities of insider trading and might act as a deterrent to competitive and healthy growth of the stock market. But, there was a procedure for stock buyback requiring the court approval and the hearing of creditors' objections or a reduction as ordered by the Company Law Board under the provisions of the Companies Act, 1956. However, with a severe downturn being noticed in the capital market operations in the early 90's and in order to help revive the sagging capital market in India, the regulators, capital market operators and industrialists collectively agreed to introduce the buyback of shares or other specified securities in India. The Government of India, accordingly, promulgated the Companies (Amendment) Ordinance, 1998 approving the buyback of shares or other specified securities for the first time in India.

## **3.2 Reasons for the Introduction of Buyback in India**

The reasons for the introduction of buyback of shares in India were to cope up with the developments in the capital market operations and to develop the Indian capital market as per the international standards. The introduction of buyback of shares in India, in general, is expected to serve the following purposes,

- 1) To revive the sagging capital market.
- 2) To signal the undervaluation of stock.
- 3) To distribute the surplus cash.
- 4) To restructure the debt equity ratio.

- 5) To counter the hostile takeover.
- 6) To signal better prospects for the company in the future.

### **3.3 Provisions of the Companies Act on Buyback of Shares**

The provisions of the Companies Act, 1956 on buyback of shares are as follows;

The Companies (Amendment) Act, 1999 vide sections 77A, 77AA and 77B allowed the buyback of shares in India with effect from October 31, 1998. The section 77A empowers the company to purchase its own shares (equity or preference shares) or other specified securities. The section 77AA prescribes a sum equal to the nominal value of the share so bought shall be transferred to the capital redemption reserve account and the details of such transfer shall be disclosed in the balance sheet of the company. And, the section 77B enlists the circumstances under which buyback of shares is prohibited.

#### **3.3.1 Provisions of the Section 77A of the Companies Act**

The following are provisions of the Section 77A of the Companies Act in brief regarding the buyback of shares;

- 1) A company may purchase its own equity shares or other specified securities out of;
  - a) its free reserves and surplus, or
  - b) the securities premium account, or
  - c) the proceeds of any shares or other specified securities.

However, the buyback of any kind of shares or other specified securities shall not be made by the company out of the proceeds of an earlier issue of the same kind of shares or other specified securities.

- 2) A company shall not buy its own shares or other specified securities unless;
  - a) the buyback is authorized by its Articles of association,
  - b) a special resolution has been passed in the annual general meeting of the company

- authorizing the buyback,
- c) the buyback is or less than 25% of the paid-capital and free reserves of the company and
  - d) the ratio of the debt owed by the company is not more than twice the capital and its free reserves i.e., 2:1 after the share buyback.
- 3) The buyback of equity shares in any financial year shall not be more than 25% of the company's total paid-up equity capital in that financial year. However, the companies can buy back less than 10% of their equity capital with the approval of the Board of directors meeting. In other words, the buyback of less than 10% of equity in any financial year does not require the approval of the shareholders. At the same time, no offer of buyback for 15% or more of the paid-capital and free reserves of the company shall be made from the open market operation method.
- 4) The notice of the meeting at which special resolution is to be passed shall be accompanied by an explanatory statement stating;
- a) a full and complete disclosure of all the material facts,
  - b) the necessity for the buyback,
  - c) the class of security intended to be bought under the buyback,
  - d) the amount to be invested in the buyback program, and
  - e) the time limit for the completion of the buyback.
- 5) The buyback offer shall open not later than seven working days from the date of the public announcement and shall close within six months from the date of opening up of the offer.
- 6) The buyback may be made;
- a) from the existing security holders on a proportionate basis, or
  - b) from the open market, or

- c) from the employees of the company
- 7) The company before making a buyback shall file a declaration of solvency in the form as may be prescribed by the regulation with the Registrar of Companies and Securities and Exchange Board of India.
- 8) Where a company purchases its own shares or specified securities, it shall extinguish and physically destroy the shares or specified securities so repurchased within seven days from the last date of the completion of the repurchase.
- 9) Where a company buys back its own securities, it shall maintain a register of;
- a) the securities bought back,
  - b) the consideration paid for the securities bought back,
  - c) the date of cancellation of securities,
  - d) the date of physically destroying of securities, and
  - e) such other information as may be prescribed.
- 10) A company shall not make any offer of buyback within a period of one year from the date of closure of the preceding offer of buyback, if any. There can be only one buyback during a year.
- 11) Where a company completes buyback of shares or other specified securities, it shall not make further issue of the same kind of shares or other specified securities within a period of one year except in discharge of the subsisting obligations.
- 12) The company shall ensure that at least 50% of the amount earmarked for buyback of specified securities in resolution is utilized for buying back of specified securities.
- 13) If a company makes any default in complying with the provisions of regulations made, the company or every officer of the company who is in default shall be punishable with an imprisonment for a period which may extend up to two years or with a fine which may extend up to fifty thousand rupees or with both.

### **3.3.2 Provisions of the Section 77AA of the Companies Act**

Where a company purchases its own equity shares out of free reserves, a sum equal to the nominal value of the share so bought back shall be transferred to the capital redemption reserve account and the details of such transfer shall be disclosed in the balance sheet of the company.

### **3.3.3 Provisions of the Section 77B of the Companies Act**

The provisions of the section 77B of the Companies Act are as follows;

- 1) The company shall not purchase its own shares or other specified securities directly or indirectly;
  - a) through any subsidiary company including its own subsidiary companies, or
  - b) through any investment company or group of investment companies, or
  - c) if there is any default which is subsisting with regard to the repayment of deposit or interest payable thereon, redemption of debentures or preference shares, payment of the interest to any debenture holder or dividend to any shareholder and repayment of any term loan or interest payable thereon to any financial institution or bank.
- 2) No company shall buy its own shares or other specified securities directly or indirectly in case such company has not complied with the provisions of sections 159 (1), 207 (12) and 211 (13).

### **3.4 SEBI Guidelines on Buyback of Shares**

The Securities and Exchange Board of India (SEBI) promulgated the guidelines relating to the buyback of securities of listed companies for the first time in 1998. All the Indian companies, whose equity shares are listed on any recognized stock exchanges, must adhere to the SEBI's buyback of securities regulations as amended till the date of buyback.

The Securities and Exchange Board of India (Buyback of securities) Regulations, 1998 was subsequently amended by the Securities and Exchange Board of India (Buyback of Securities) (Amendment) Regulations, 1999. These regulations contain substantive procedural requirements for carrying out the buyback of equity shares of listed companies. The procedural requirements as laid down by the regulations include Seven Chapters and Four Schedules prescribing in detail the methodology of conducting the buyback operations and the contents of the various documents connected therewith.

The Chapter I contains the definitions of the various terms used in the regulations. The conditions of buyback are detailed out in the Chapter II. The Chapter III consists of the procedure for buyback through tender offer. The procedure for buyback from the open market operation both through stock exchange and through book building process is outlined in the Chapter IV. The Chapter V enumerates the general obligations of the company and the merchant banker in relation to the buyback and prescribes the action that may be taken against the intermediaries on failing to comply with such obligations. The penalties and procedure on alleged contravention of the provisions of buyback are listed down in the Chapter VI. And, the chapter VII, under the miscellaneous head, vests the power with the Board to remove any difficulties in the interpretation or application of the provisions of the regulations by issuing directions through guidance notes or circulars.

The Schedule I deals with the contents of explanatory statements to be annexed to the notice convening the general meeting of the shareholders at which special resolution for buyback is to be passed. The contents of the public announcement of buyback are outlined in the Schedule II. The Schedule III lays down the disclosures to be made in the offer. And, the fees payable by the company's merchant banker while submitting the offer

document or a copy of the public announcement to the Board are laid down in the Schedule IV.

### **SEBI Regulations in brief on the Buyback of Shares**

- 1) A company may buy back its own specified securities either from the existing shareholders on a proportionate basis through tender offer or from the open market operation through stock exchange or book building process. However, a buyback through negotiated deals or through spot transactions or through any private placement shall not be permitted. Moreover, any person or insider shall not deal in securities of the company on the basis of the unpublished information relating to the buyback of specified securities of the company.
- 2) Regardless of the method used for buyback, the special or board resolution shall specify the maximum price at which the buyback shall be made. Moreover, in the case of tender offer, the resolution must state whether the Board of Directors of the company are being authorized to determine subsequently the specific price at which buyback may be made.
- 3) If the promoters or persons in control of the company intend to offer their specified securities in a tender offer, the resolution must disclose the quantum of specified securities proposed to be tendered by them, the details of their transactions and their holdings for the last six months prior to the passing of the resolution for the buyback and the number of specified securities purchased and the price and the date of the securities purchased. The buyback of securities however shall not be made from the promoters or persons in control of the company in case of the buyback from the open market operation through the stock exchange.
- 4) A public announcement of the buyback offer shall be made by the company at least seven days prior to the commencement of the buyback of the specified securities in at

least one English National Daily, one Hindi National Daily and one regional Language Daily all with wide circulation at the place where the registered office of the company is situated.

- 5) The public announcement shall specify the specified date for determining the names of the security holders to whom the letter of offer shall be sent. The specified date shall not be earlier than 30 days and not later than 42 days from the date of the public announcement.
- 6) The public announcement shall also disclose the details of the brokers and stock exchanges through which buyback shall be made in the case of buyback through stock exchange and the detailed methodology, the format and the manner in which the acceptance to be sent by the security holders and the particulars of bidding centers in the case of book building method.
- 7) The company shall, before opening of the tender offer, create an escrow account towards specified security for performance of its obligations and deposit 25% of the amount earmarked for the buyback as specified in the resolution in the escrow account.
- 8) The date of opening of the tender offer shall not be earlier than 7 days and not later than 30 days after the specified date. The letter of the offer shall reach the security holders before the opening of the offer. The buyback offer in case of both tender offer method and book building process method shall remain open to the shareholders for a period of not less than 15 days and exceeding 30 days
- 9) In case of open market buyback through the stock exchange, the buyback of securities shall be made through order matching mechanism only on such stock exchanges which have electronic trading facility so that the identity of the company as a buyer appears on the electronic screen whenever the order is placed. However, the company and the merchant banker shall give the information on the securities bought back to the stock

exchange on a daily basis and publish it in a national daily.

- 10) The company shall complete the verification of the offers received under the tender offer method and book building process method within 15 days of the closure of the offer and the specified securities lodged shall be deemed to be accepted unless a communication of rejection is made within said period. The company shall, within 7 days from the completion of the verification of acceptances, make the payment of the consideration in cash to those security holders whose offers have been accepted or return the security certificates to the holders if rejected.
- 11) The company shall, in all the three methods, extinguish and destroy the securities in the manner as specified in the Securities and Exchange Board of India (Depositories and Participants) Regulations, 1996 and the byelaws made there under.
- 12) In case of non- fulfillment of the obligations by the company, the Board may forfeit the escrow account either in part or in full and deposit the amount so forfeited in the investor protection and education fund of Securities and Exchange Board of India. Similarly, on failure of the merchant banker or the registrar or the broker to fulfill the obligations or failing to observe the due diligence, the Board may initiate action against such merchant banker or the registrar or the broker in terms of the regulations applicable to such intermediaries.

### **3.5 Trend in Buyback of Equity**

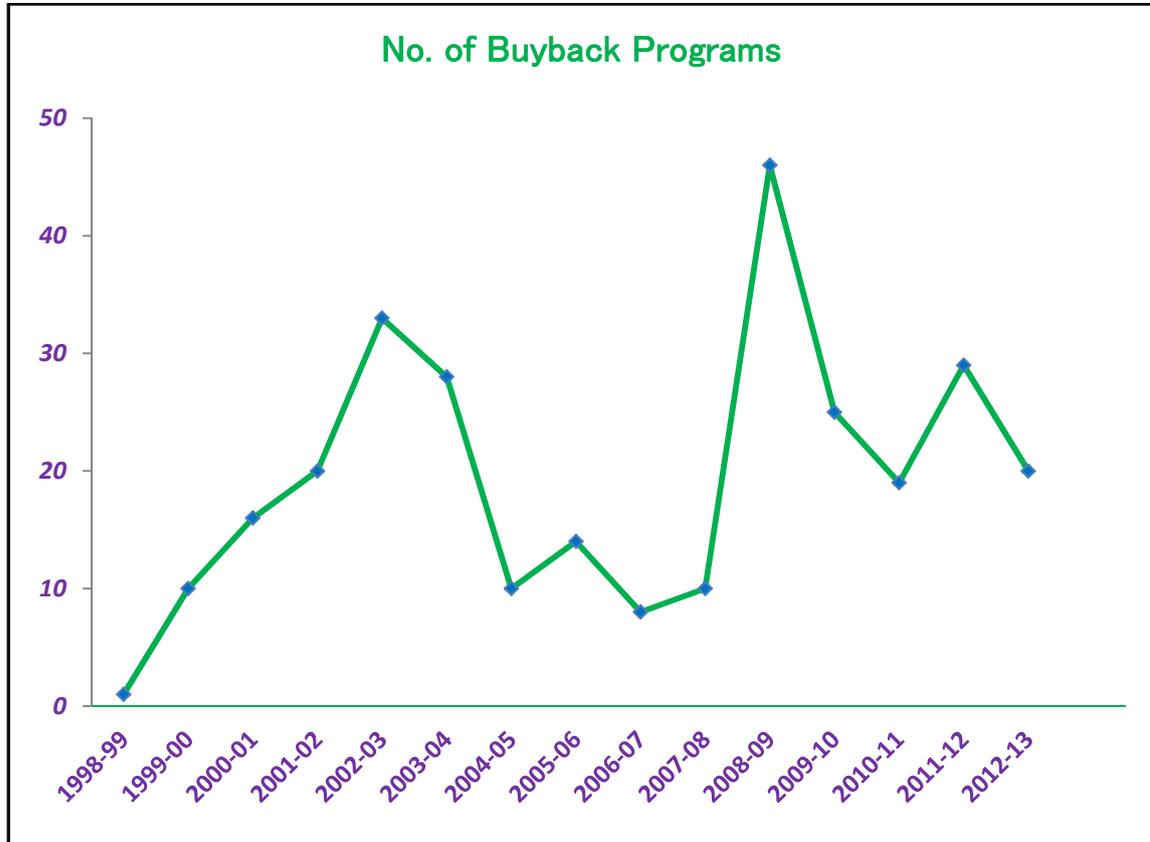
Buyback of shares by companies was allowed in India in 1998. Since then, a number of companies bought back their shares either through open market operation or by fixed price tender method. The share certificates of the shares so bought back are to be extinguished and physically destroyed by the company. The following table shows number of buyback programs and buyback size from 1998 to 20 13;

**Table No. 3. 1**  
**Number and Size of Buyback Announcements**  
**from 1998-99 to 2012-13**

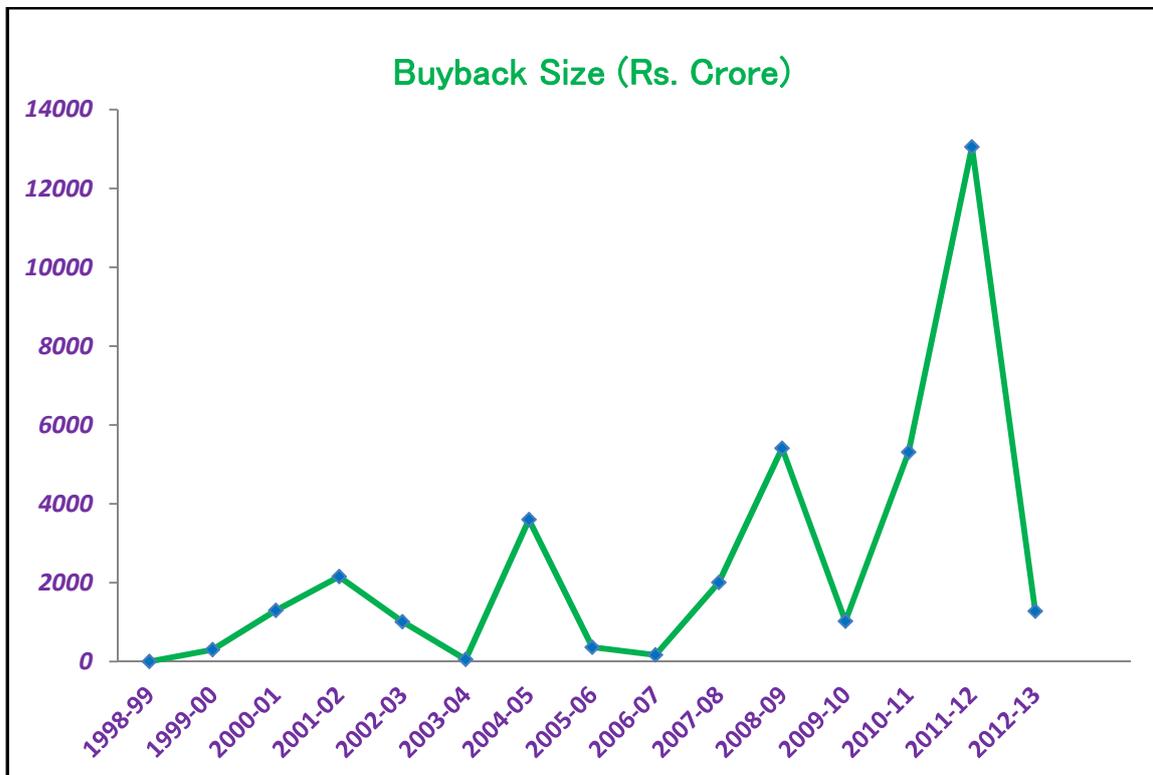
| Year         | No. of Buyback | Buyback Size (Rs. Crore) |
|--------------|----------------|--------------------------|
| 1998-99      | 01             | 01                       |
| 1999-00      | 10             | 300                      |
| 2000-01      | 16             | 1297                     |
| 2001-02      | 20             | 2154                     |
| 2002-03      | 33             | 1011                     |
| 2003-04      | 28             | 52                       |
| 2004-05      | 10             | 3600                     |
| 2005-06      | 14             | 363                      |
| 2006-07      | 08             | 166                      |
| 2007-08      | 10             | 2004                     |
| 2008-09      | 46             | 5412                     |
| 2009-10      | 25             | 1020                     |
| 2010-11      | 19             | 5315                     |
| 2011-12      | 29             | 13058                    |
| 2012-13      | 20             | 1277                     |
| <b>TOTAL</b> | <b>289</b>     | <b>37030</b>             |

**Source: SEBI Status Report on Buyback**

**Chart No. 3.1**  
**Number of Buyback Programs**



**Chart No. 3.2**  
**Buyback Size**



From the above table and charts, it is clear that in the financial year 1998 – 99, when buyback was allowed in India, only one company announced the buyback of shares with a buyback size of Rs. 1 crore. The number of buyback of shares then increased to 33 announcements with a buyback corpus of Rs.1011 crores in 2002 -03 and 46 announcements with a buyback size of Rs.5412 crores in 2008 – 09. However, the buyback size of Rs.13058 crores in 2011 – 12 was the highest buyback size as compared to the buyback size of each of the year during the period from 1998 to 2013. Thus, the buyback announcements by listed companies grew from 1 announcement with a buyback size of Rs. 1 crore in 1998-99 to 289 announcements with a buyback corpus of Rs. 37030 crores in 2012-13.

### **3.6 Stock Splits in India**

The Ministry of Finance vide circular no. 1/7/SE/81 dated January 22, 1983 had restricted to change the face value at a denomination lower than Rs. 10 keeping them fixed at Rs. 10 or Rs. 100. However, the Companies Act, 1956 empowered a limited company to alter its share capital by using stock splits but the stock splits were not very common in the Indian stock market as the listed shares had a fixed face value of Rs.10 or Rs.100. The usage of stock splits increased after the approval for the stock splits from the SEBI vide circular no. SMDRP/POLICY/CIR-16/99 dated June 14, 1999. This circular from the SEBI on stock splits allowed the companies to choose any face value for their equity shares provided it is not issued in a decimal of a rupee.

After the introduction of stock splits in India in 1999, it was observed that the several companies were resorting to frequent splitting of their stocks within a short period of time. The Securities and Exchange Board of India set up the Secondary Market Advisory Committee (SMAC) as a standing committee to advice on the matters related to the Secondary Market including the existing loop holes in splitting a stock by the company. The committee was reconstituted under the chairmanship of Dr. R. H. Patil. The SMAC deliberated on the aforesaid issue and recommended that the provisions of the SEBI circular no. SMDRP/POLICY/CIR-16/99 dated June 14, 1999 may be modified to include the following;

- 1) The existing companies which have issued Rs.10 or Rs.100 may change the standard denomination into any denomination other than decimal of a rupee by splitting the existing shares after amending their memorandum of association and articles of association.

- 2) No listed company whose market price in the previous six months is less than Rs. 500 per share can split the face value of its equity share.
- 3) If the company had gone in for splits, it would not be permitted to do it again for a period of three years from the date of the last splits.
- 4) A change in the par value will have to be disseminated through the websites of the stock exchanges and through EDIFAR for a continuous period of one year from the date of the last splits.

### **3.7 Trend in Stock Splits**

The splitting of the face value of a stock in any denomination except in decimals was allowed in 1998. Since 1998, a number of companies, large or small, split their stocks from a higher denomination into a lower. The table given below depicts the stock splits announcements by listed companies from 1998 to 2013,

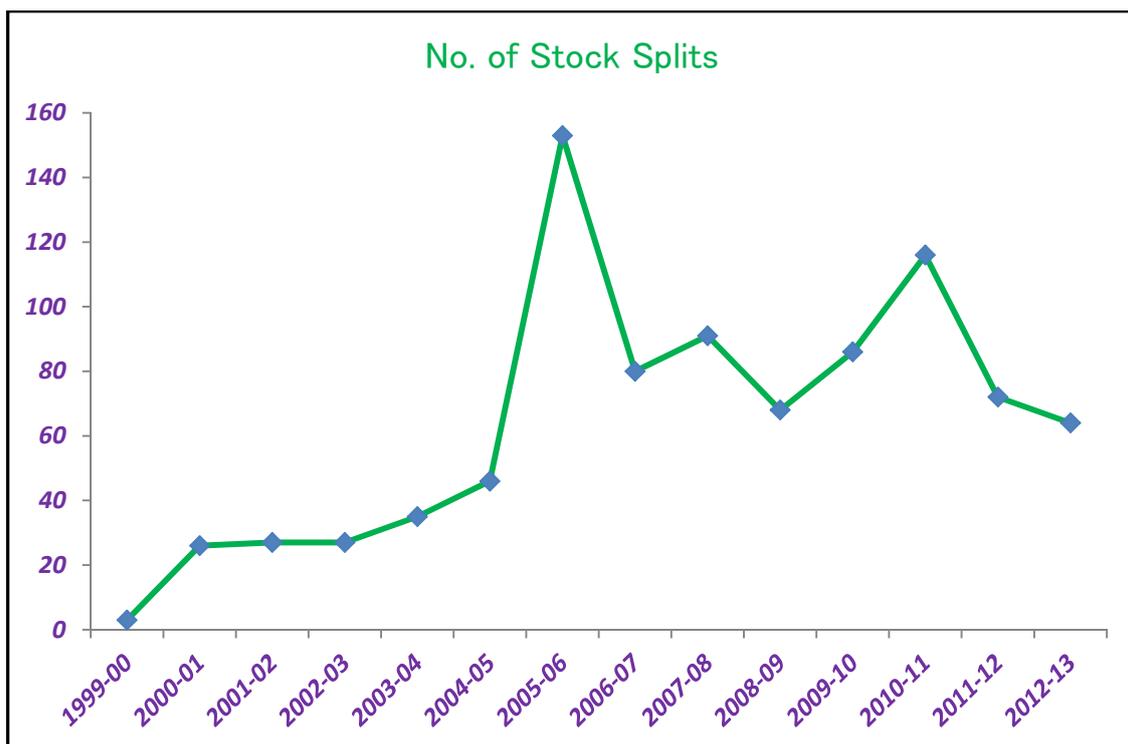
**Table no. 3. 2**  
**Stock Splits Announcements by Listed Companies**  
**from 1998-99 to 2012-13**

| Year    | No. of Stock Splits |
|---------|---------------------|
| 1998-99 | ---                 |
| 1999-00 | 3                   |
| 2000-01 | 26                  |
| 2001-02 | 27                  |
| 2002-03 | 27                  |
| 2003-04 | 35                  |
| 2004-05 | 46                  |
| 2005-06 | 153                 |

|         |     |
|---------|-----|
| 2006-07 | 80  |
| 2007-08 | 91  |
| 2008-09 | 68  |
| 2009-10 | 86  |
| 2010-11 | 116 |
| 2011-12 | 72  |
| 2012-13 | 64  |
| TOTAL   | 894 |

Source: Motilal Oswal Data Base

**Chart No. 3.3**  
**Number of Stock Splits**



The above table and chart indicate that the number of stock splits increased from 03 announcements in 1999- 2000 to 153 announcements in 2005- 06. It increased consecutively year by year since the announcement of stock splits till 2005- 06. However, the number of stock splits announcements by the companies from 2006-07 to 2012-13 was

within a range of above 60 announcements and below 120 announcements. Thus, the stock splits announcements by the companies rose from 3 announcements in 1999-2000 to 894 announcements in 2012-13.

### **3.8 Conclusion**

The buyback announcements grew from 1 announcement with a buyback size of Rs.1 crore in 1998-99 to 289 announcements with a buyback corpus of Rs. 37030 crores in 2012-13 while the stock splits announcements rose from 3 announcements in 1999 – 2000 to 894 announcements in 2012 – 13. **This indicates that the stock splits announcements were more than the buyback announcements by three folds during the period under the study. The reason may be that the companies go in for stock splits rather than stock buyback as it does not require funds for the announcement.**

## CHAPTER - 4

# **ABNORMAL RETURNS FROM STOCK BUYBACK AND STOCK SPLITS**

## **(ABNORMAL RETURNS ANALYSIS)**

# **ABNORMAL RETURNS ANALYSIS**

## **4.1 Introduction**

When a company announces stock buyback or stock splits, it signals to the market that it is financially and fundamentally strong and it has better and bright prospects in the future. The market normally reacts to the positive information of the announcement of buyback or stock splits positively. As a result, the stock price of the company moves upward. If the stock price of the company out performs the market, the actual returns from the stock will be more than the expected returns. The difference between the actual returns and the expected returns results into abnormal returns. The study, therefore, in this chapter, calculates and analyzes the abnormal returns from the announcement of buyback and stock splits both before and after the announcement in order to assess and ascertain whether stock buyback and stock splits announcements signal the abnormal returns.

## **4.2 Objective**

The second objective of the present research work is to study and analyze the impact of buyback of equity and stock splits announcements on the market price. The aforesaid objective is achieved by calculating and analyzing the abnormal returns from the buyback and stock splits announcements.

## **4.3 Methodology**

The methodology used in this chapter includes the following;

### **4.3.1 Hypotheses**

#### **Stock Buyback**

H0: AR from BB = 0

H1: AR from BB  $\neq$  0

#### **Stock Splits**

H0: AR from SS = 0

H1: AR from SS  $\neq$  0

### **4.3.2 Data Analysis**

The abnormal returns from the stock buyback and stock splits are calculated for the different plus and minus window periods for each sample company and averaged for the number of sample companies in order to prevent the influence of any one company or a group of companies. The cumulative average abnormal returns are also calculated with a view to know the cumulative effect of the average abnormal returns.

### **4.3.3 Sample Size**

The sample size for the abnormal returns analysis consists of 64 buyback programs out of 82 buyback programs in the case of buyback of shares and 86 stock splits out of 90 stock splits in respect of the stock splits. The 18 buy back and 4 stock splits announcements have been excluded due to the non availability of the data for the analysis.

### **4.3.4 Test Statistics**

A large sample test statistics has been conducted at 5% and 1% level of significance to find out whether abnormal returns for the different window periods are statistically significant.

### 4.3.5 Classification of the Window Period

The window period of – 45 days to +45 days i.e. 91 days has been classified into the following five categories;

- i) Announcement Day
- ii) Pre announcement Period (– 1 to -45 days)
- iii) Post announcement Period (+ 1 to + 45 days)
- iv) Pre vis-à-vis Post announcement Period (- 1 to – 45 days to + 1 to + 45 days)
- v) 91 days Window Period ( -45 days to + 45 days).

### 4.4 AARs, CAARs and Companies with Positive AARs of Buyback Companies

The average abnormal returns, cumulative average abnormal returns and companies with positive average abnormal returns of stock buyback companies for -45 days to + 45 days i.e., 91 days window period are shown in the following table;

**Table No. 4.1**  
**AARs, CAARs and Companies with Positive AARs of Buyback Companies**  
**for – 45 days to + 45 days i.e., 91 days Window Period**

| Days | AARs    | CAARs   | No. of companies With +AARs |
|------|---------|---------|-----------------------------|
| -45  | -0.084  | -0.084  | 24                          |
| -44  | -0.2255 | -0.3094 | 34                          |
| -43  | 0.1003  | -0.2091 | 31                          |
| -42  | 0.0634  | -0.1457 | 28                          |
| -41  | -0.4065 | -0.5522 | 26                          |
| -40  | -0.117  | -0.6692 | 29                          |
| -39  | -0.3718 | -1.041  | 27                          |

|            |         |         |    |
|------------|---------|---------|----|
| <b>-38</b> | -0.0973 | -1.1383 | 31 |
| <b>-37</b> | -0.0745 | -1.2128 | 33 |
| <b>-36</b> | -0.2938 | -1.5067 | 24 |
| <b>-35</b> | -0.0871 | -1.5937 | 32 |
| <b>-34</b> | 0.0679  | -1.5258 | 32 |
| <b>-33</b> | 0.2529  | -1.2729 | 33 |
| <b>-32</b> | -0.3854 | -1.6583 | 32 |
| <b>-31</b> | 0.0696  | -1.5887 | 33 |
| <b>-30</b> | -0.2641 | -1.8528 | 22 |
| <b>-29</b> | -0.232  | -2.0848 | 29 |
| <b>-28</b> | 0.0354  | -2.0494 | 33 |
| <b>-27</b> | 0.0586  | -1.9908 | 28 |
| <b>-26</b> | 0.0547  | -1.9361 | 35 |
| <b>-25</b> | -0.0701 | -2.0062 | 26 |
| <b>-24</b> | -0.032  | -2.0382 | 32 |
| <b>-23</b> | -0.1481 | -2.1864 | 32 |
| <b>-22</b> | -0.0609 | -2.2472 | 32 |
| <b>-21</b> | 0.0407  | -2.2065 | 27 |
| <b>-20</b> | -0.0613 | -2.2678 | 27 |
| <b>-19</b> | -0.3441 | -2.6119 | 27 |
| <b>-18</b> | -0.0963 | -2.7082 | 24 |
| <b>-17</b> | 0.3305  | -2.3777 | 37 |
| <b>-16</b> | -0.104  | -2.4817 | 30 |
| <b>-15</b> | -0.1826 | -2.6642 | 31 |
| <b>-14</b> | -0.0704 | -2.7347 | 30 |
| <b>-13</b> | -0.1795 | -2.9142 | 23 |
| <b>-12</b> | -0.1445 | -3.0587 | 28 |
| <b>-11</b> | 0.3357  | -2.723  | 41 |
| <b>-10</b> | 0.2188  | -2.5042 | 35 |
| <b>-9</b>  | -0.1179 | -2.6221 | 28 |
| <b>-8</b>  | -0.19   | -2.8121 | 36 |

|           |                |                |           |
|-----------|----------------|----------------|-----------|
| -7        | -0.0596        | -2.8717        | 26        |
| -6        | -0.2173        | -3.089         | 27        |
| -5        | -0.0989        | -3.1879        | 22        |
| -4        | -0.0607        | -3.2486        | 33        |
| -3        | 0.0485         | -3.2           | 28        |
| -2        | -0.0581        | -3.2581        | 35        |
| -1        | -0.0211        | -3.2793        | 31        |
| <b>0</b>  | <b>-0.1855</b> | <b>-3.4648</b> | <b>30</b> |
| <b>1</b>  | 0.0936         | -3.3712        | 30        |
| <b>2</b>  | 0.2202         | -3.1509        | 38        |
| <b>3</b>  | -0.2404        | -3.3913        | 28        |
| <b>4</b>  | -0.0699        | -3.4612        | 31        |
| <b>5</b>  | -0.167         | -3.6281        | 35        |
| <b>6</b>  | 0.1367         | -3.4914        | 38        |
| <b>7</b>  | 0.1061         | -3.3853        | 36        |
| <b>8</b>  | -0.0472        | -3.4325        | 35        |
| <b>9</b>  | 0.4961         | -2.9365        | 36        |
| <b>10</b> | 0.235          | -2.7014        | 35        |
| <b>11</b> | -0.0578        | -2.7592        | 29        |
| <b>12</b> | 0.5246         | -2.2346        | 36        |
| <b>13</b> | 0.4523         | -1.7823        | 36        |
| <b>14</b> | -0.2214        | -2.0037        | 27        |
| <b>15</b> | 0.0351         | -1.9686        | 32        |
| <b>16</b> | -0.1549        | -2.1235        | 35        |
| <b>17</b> | -0.3038        | -2.4274        | 22        |
| <b>18</b> | 0.5353         | -1.8921        | 39        |
| <b>19</b> | -0.1192        | -2.0112        | 25        |
| <b>20</b> | -0.166         | -2.1772        | 30        |
| <b>21</b> | -0.2171        | -2.3943        | 25        |
| <b>22</b> | 0.0883         | -2.3059        | 35        |
| <b>23</b> | -0.1726        | -2.4786        | 26        |

|           |         |         |    |
|-----------|---------|---------|----|
| <b>24</b> | -0.0995 | -2.578  | 31 |
| <b>25</b> | 0.0416  | -2.5364 | 37 |
| <b>26</b> | -0.0942 | -2.6306 | 30 |
| <b>27</b> | 0.2311  | -2.3995 | 36 |
| <b>28</b> | -0.0885 | -2.488  | 39 |
| <b>29</b> | -0.2439 | -2.7319 | 36 |
| <b>30</b> | 0.0821  | -2.6498 | 29 |
| <b>31</b> | -0.2476 | -2.8974 | 29 |
| <b>32</b> | -0.0044 | -2.9017 | 29 |
| <b>33</b> | -0.0616 | -2.9634 | 27 |
| <b>34</b> | 0.2758  | -2.6876 | 32 |
| <b>35</b> | -0.2208 | -2.9084 | 31 |
| <b>36</b> | -0.6784 | -3.5868 | 26 |
| <b>37</b> | 0.1454  | -3.4414 | 30 |
| <b>38</b> | -0.2727 | -3.7141 | 26 |
| <b>39</b> | 0.0784  | -3.6356 | 34 |
| <b>40</b> | 0.1599  | -3.4757 | 31 |
| <b>41</b> | -0.0342 | -3.5099 | 33 |
| <b>42</b> | 0.0208  | -3.489  | 34 |
| <b>43</b> | 0.0417  | -3.4473 | 25 |
| <b>44</b> | -0.6882 | -4.1355 | 26 |
| <b>45</b> | 0.7959  | -3.3396 | 24 |

## 4.5 AARs, CAARs and Companies with Positive AARs of Stock Splits Companies

The following table depicts the average abnormal returns, cumulative average abnormal returns and companies with positive average abnormal returns of stock splits companies for – 45 days to + 45 days i.e., 91 days window period;

**Table No. 4.2**  
**AARs, CAARs and Companies with Positive AARs of Stock Splits Companies**  
**for – 45 days to + 45 days i.e., 91 days Window Period**

| Days | AARs    | CAARs   | No. of companies with +AARs |
|------|---------|---------|-----------------------------|
| -45  | -0.2716 | -0.2716 | 35                          |
| -44  | 0.178   | -0.0936 | 37                          |
| -43  | 0.144   | 0.0505  | 35                          |
| -42  | -0.1307 | -0.0802 | 33                          |
| -41  | -0.239  | -0.3192 | 34                          |
| -40  | -0.4423 | -0.7615 | 33                          |
| -39  | -0.6168 | -1.3783 | 34                          |
| -38  | -0.686  | -2.0642 | 23                          |
| -37  | -0.5636 | -2.6279 | 23                          |
| -36  | -0.1777 | -2.8055 | 35                          |
| -35  | -0.2994 | -3.1049 | 37                          |
| -34  | 0.1215  | -2.9835 | 35                          |
| -33  | -0.428  | -3.4114 | 30                          |
| -32  | 0.0648  | -3.3466 | 37                          |
| -31  | -0.0483 | -3.3949 | 36                          |
| -30  | -0.3947 | -3.7897 | 30                          |
| -29  | -0.2996 | -4.0892 | 28                          |
| -28  | -0.3273 | -4.4165 | 28                          |
| -27  | -1.1511 | -5.5676 | 24                          |

|          |                 |                 |           |
|----------|-----------------|-----------------|-----------|
| -26      | -0.388          | -5.9556         | 28        |
| -25      | -0.4245         | -6.3801         | 28        |
| -24      | -0.3998         | -6.7799         | 28        |
| -23      | -0.1067         | -6.8865         | 29        |
| -22      | -0.1374         | -7.024          | 37        |
| -21      | -0.2638         | -7.2878         | 37        |
| -20      | -0.4931         | -7.7809         | 32        |
| -19      | -0.229          | -8.0099         | 40        |
| -18      | -0.3496         | -8.3595         | 32        |
| -17      | -0.0679         | -8.4274         | 27        |
| -16      | -0.0627         | -8.4901         | 29        |
| -15      | 0.0952          | -8.3949         | 39        |
| -14      | 0.0692          | -8.3257         | 38        |
| -13      | -0.1381         | -8.4638         | 34        |
| -12      | -0.4356         | -8.8994         | 35        |
| -11      | -0.4483         | -9.3476         | 29        |
| -10      | -0.4706         | -9.8183         | 22        |
| -9       | -0.3161         | -10.1344        | 33        |
| -8       | -0.4852         | -10.6196        | 34        |
| -7       | -1.1361         | -11.7556        | 23        |
| -6       | -0.4925         | -12.2481        | 31        |
| -5       | -0.2616         | -12.5097        | 33        |
| -4       | -0.7414         | -13.2511        | 28        |
| -3       | -0.375          | -13.626         | 31        |
| -2       | -1.4545         | -15.0805        | 37        |
| -1       | -0.1476         | -15.2281        | 46        |
| <b>0</b> | <b>-30.1267</b> | <b>-45.3548</b> | <b>15</b> |
| <b>1</b> | -0.1669         | -45.5217        | 32        |
| <b>2</b> | -0.1904         | -45.7121        | 35        |
| <b>3</b> | -0.497          | -46.2091        | 34        |
| <b>4</b> | 0.1785          | -46.0306        | 41        |

|    |         |          |    |
|----|---------|----------|----|
| 5  | 0.2807  | -45.7499 | 46 |
| 6  | 0.4317  | -45.3183 | 40 |
| 7  | 0.0115  | -45.3068 | 39 |
| 8  | -0.286  | -45.5927 | 38 |
| 9  | -0.1738 | -45.7665 | 37 |
| 10 | -0.2756 | -46.0421 | 31 |
| 11 | -0.4028 | -46.4449 | 29 |
| 12 | -0.2219 | -46.6668 | 37 |
| 13 | -1.0751 | -47.7419 | 35 |
| 14 | -0.2072 | -47.9491 | 32 |
| 15 | 0.0188  | -47.9303 | 34 |
| 16 | -0.019  | -47.9493 | 38 |
| 17 | 0.2852  | -47.6642 | 44 |
| 18 | 0.0779  | -47.5863 | 41 |
| 19 | 0.3241  | -47.2622 | 41 |
| 20 | -0.0228 | -47.285  | 35 |
| 21 | 0.0814  | -47.2036 | 35 |
| 22 | 0.1393  | -47.0643 | 40 |
| 23 | -0.0692 | -47.1334 | 33 |
| 24 | -0.4485 | -47.5819 | 31 |
| 25 | -0.412  | -47.9939 | 29 |
| 26 | -0.0556 | -48.0495 | 35 |
| 27 | -0.2008 | -48.2502 | 33 |
| 28 | 0.0909  | -48.1593 | 32 |
| 29 | 0.0457  | -48.1136 | 39 |
| 30 | -0.3805 | -48.4941 | 32 |
| 31 | -0.6455 | -49.1395 | 30 |
| 32 | -0.4278 | -49.5673 | 29 |
| 33 | -0.158  | -49.7253 | 31 |
| 34 | 0.217   | -49.5082 | 37 |
| 35 | 0.027   | -49.4813 | 37 |

|    |         |          |    |
|----|---------|----------|----|
| 36 | -0.3931 | -49.8743 | 33 |
| 37 | -0.5413 | -50.4157 | 33 |
| 38 | 0.0079  | -50.4078 | 35 |
| 39 | -0.1164 | -50.5242 | 35 |
| 40 | -0.4983 | -51.0224 | 31 |
| 41 | 0.1204  | -50.902  | 45 |
| 42 | -0.5161 | -51.4181 | 31 |
| 43 | -0.3661 | -51.7842 | 32 |
| 44 | -0.3189 | -52.1031 | 37 |
| 45 | 0.4168  | -51.6863 | 38 |

#### **4.6 AARs from Buyback and Stock Splits for 91 days Window Period;**

The average abnormal returns for - 45 days and + 1day window periods are compared with the average abnormal returns for -1 day and +45 days window periods respectively to assess whether there is any change in the average abnormal returns during those window periods. Similarly, the average abnormal returns for + 1 day to + 45 days window period are compared with the average abnormal returns for - 1 day to - 45 days window period to ascertain whether average abnormal returns for plus window period differ from the minus window period. Moreover, the average abnormal returns for - 45 days to + 45 days i.e., 91 days window period are assessed to know whether there are abnormal returns during the entire period of 91 days.

##### **4.6.1 Analysis and Interpretation of AARs for 91 days Window Period from Buyback**

The average abnormal returns for - 45 days to + 45 days i.e., 91 days window period from the announcement of buyback of equity shares have been analyzed and interpreted with the following tables;

### 1) Announcement Day Returns

The average abnormal returns from the stock buyback on the announcement day are **-0.1855**.

### 2) Pre announcement Period (-45 to -1 days Window Period)

**Table No. 4. 3**  
**Pre announcement Period (-45 to -1 days Window Period)**  
**(Test Statistics)**

| Window Period | N  | Mean   | Std. Deviation | Test statistics | Sig. (2-tailed) |
|---------------|----|--------|----------------|-----------------|-----------------|
| -45 to -1     | 45 | 0.0729 | 0.1699         | 2.878**         | 0.0062          |

**Note:** \*\* indicates significant at 1%

The Table No.4.3 indicates that the average abnormal returns before the announcement of buyback for -45 to -1 day window period are negative (Mean < 0). Null hypothesis is rejected at 1% level of significance. **The average abnormal returns from the buyback before the announcement are less than zero (AARs  $\neq$  0). Therefore, there are negative abnormal returns from the buyback of equity in the pre announcement period.**

### 3) Post announcement Period (+1 to +45 days Window Period)

**Table No. 4. 4**  
**Post announcement Period (+1 to +45 days Window Period)**  
**(Test Statistics)**

| Window Period | N  | Mean   | Std. Deviation | Test statistics | Sig. (2-tailed) |
|---------------|----|--------|----------------|-----------------|-----------------|
| +1 to +45     | 45 | 0.0028 | 0.2852         | 0.065           | 0.9481          |

From the Table No.4.4, it is clear that the average abnormal returns after the announcement of buyback for +1 to +45 days window period are zero (Mean = 0). Null

hypothesis is accepted at 1% level of significance. **The average abnormal returns from the stock buyback in the post announcement period are zero (AARs = 0). Hence, there are no abnormal returns from the stock buyback after the announcement.**

**.4) Pre vis-à-vis Post announcement Period (- 45 to -1 and +1 to +45 days Window Periods)**

**Table No. 4. 5**  
**Pre vis-à-vis Post announcement Period**  
**(- 45 to -1 and +1 to +45 days Window Periods)**  
**(Test Statistics)**

| Group     | N  | Mean    | Std. Deviation | Test statistics | Sig. (2-tailed) |
|-----------|----|---------|----------------|-----------------|-----------------|
| -45 to -1 | 45 | -0.0729 | 0.1699         | -1.529          | 0.1299          |
| +1 to +45 | 45 | 0.0028  | 0.2852         |                 |                 |

The above table shows that the average abnormal returns before the announcement of buyback for -45 to -1 days window period are equal to the average abnormal returns after the announcement of buyback for +1 to +45 days window period (Mean = 0). Null hypothesis is accepted at 1% level of significance. **The average abnormal returns from the buyback in both the periods do not differ or equal to zero (AARs = 0). The abnormal returns from the buyback therefore neither increase nor decrease but remains the same in the post announcement period as compared to the pre announcement period..**

**5) 91 days Window Period (-45 to +45 days Window Period)**

**Table No. 4. 6**  
**91 days Window Period (-45 to +45 days Window Period)**  
**(Test Statistics)**

| Window Period | N  | Mean    | Std. Deviation | Test statistics | Sig. (2-ailed) |
|---------------|----|---------|----------------|-----------------|----------------|
| -45 to+45     | 91 | -0.0350 | 0.2365         | 1.406           | 0.1633         |

The Table No.4.6 exhibits that the average abnormal returns from the buyback for -45 to +45 days i.e. 91 days window period are zero (Mean = 0). Null hypothesis is accepted at 1% level of significance. **The average abnormal returns from the buyback of equity for 91 days window period are zero (AARs = 0). Therefore, there are no abnormal returns from the stock buyback for the entire window period of 91days.**

## 6) Findings

The study makes the following statements on the findings of abnormal returns from the announcement of buyback on the announcement day and for 91 days window period;

- I) The **average abnormal returns (AARs)** from the announcement of buyback on the **announcement day are -0.1855.**
- ii) The **cumulative average abnormal returns (CAARs)** from the announcement of buyback for **91days window period are - 3.3396**
- iii) There are **no abnormal returns and cumulative abnormal returns** from the stock buyback announcement for **91 days window period**

### 4.6.2 Analysis and Interpretation of AARs for 91 days Window Period from Stock Splits

The analysis and interpretation of the average abnormal returns for - 45 days to + 45 days i. e. 91 days from the announcement of stock splits have been made as in the following;

#### 1) Pre announcement Period (-45 to -1 days window Period)

**Table No. 4. 7**  
**Pre announcement Period (-45 to -1 days Window Period)**  
**(Test Statistics)**

| Window Period | N  | Mean    | Std. Deviation | Test statistics | Sig. (2-tailed) |
|---------------|----|---------|----------------|-----------------|-----------------|
| -45 to -1     | 45 | -0.3384 | 0.3317         | 6.844**         | 0.0000          |

**Note: \*\* indicates significant at 1%**

The above table depicts that the average abnormal returns in the pre stock splits announcement period for -45 to -1 days window period are negative (Mean < 0). Null hypothesis is rejected at 1% level of significance. **The average abnormal returns from the stock splits are less than zero in the pre announcement period (AARs < 0). Therefore, there are negative abnormal returns from the stock splits before the announcement.**

**2) Post announcement Period (+1 to +45 days Window Periods)**

**Table No. 4. 8**  
**Post announcement Period (+1 to +45 days Window Periods)**  
**(Test Statistics)**

| Window Period | N  | Mean    | Std. Deviation | Test statistics | Sig. (2-tailed) |
|---------------|----|---------|----------------|-----------------|-----------------|
| +1 to +45     | 45 | -0.1407 | 0.3083         | 3.062**         | 0.0037          |

**Note: \*\* indicates significant at 1%**

The Table No.4.8 indicates that the average abnormal returns after the announcement of stock splits for +1 to +45 days window period are negative (Mean < 0). Null hypothesis is rejected at 1% level of significance. **The average abnormal returns from the stock splits after the announcement are less than zero (AARs < 0). Hence, there are negative abnormal returns from the stock splits in the post announcement period.**

**3) Pre vis-à-vis Post announcement Period (-45 to -1 and +1 to +45 days Window Periods)**

**Table No. 4. 9**

**Pre vis-à-vis Post announcement Period  
(-45 to -1 and +1 to +45 days Window Periods)  
(Test Statistics)**

| Group     | N  | Mean    | Std. Deviation | Test statistics | Sig. (2-tailed) |
|-----------|----|---------|----------------|-----------------|-----------------|
| -45 to -1 | 45 | -0.3384 | 0.3317         | 2.929**         | 0.0043          |
| +1 to +45 | 45 | -0.1407 | 0.3083         |                 |                 |

**Note: \*\* indicates significant at 1%**

From the above table, it is clear that the average abnormal returns before the announcement of stock splits for -45 to -1 days window period are negative and do not differ from the average abnormal returns for +1 to +45 days window period after the announcement of stock splits (Mean = 0). Null hypothesis is accepted at 1% level of significance. **The average abnormal returns in the pre stock splits announcement period are equal to the average abnormal returns in the post stock splits announcement period (AARs = 0). Therefore, the abnormal returns in the post stock splits announcements period do not differ from the pre stock splits announcement period.**

**4) 91 days window Period (-45 days to +45 days window period)**

**Table No. 4. 10**

**91 days window Period (-45 days to +45 days Window Period)  
(Test Statistics)**

| Window Period | N  | Mean    | Std. Deviation | Test statistics | Sig. (2-tailed) |
|---------------|----|---------|----------------|-----------------|-----------------|
| -45 to +45    | 90 | -0.2396 | 0.3336         | 6.813**         | 0.0000          |

**Note: \*\* indicates significant at 1%**

The Table No.4.10 shows that the average abnormal returns for -45 to +45 days i.e. 91 days window period are negative (Mean < 0). Null hypothesis is rejected at 1% level of significance. **The average abnormal returns from the stock splits for 91 days window period are less than zero (AARs < 0). Therefore, the abnormal returns from the stock splits announcement for the entire window period of 91 days are negative.**

## **5) Findings**

The findings of the present research work on the abnormal returns from the announcement of stock splits for 91 days window period include the following;

- i) The **cumulative average abnormal returns (CAARs)** from the announcement of stock splits for **91 days window period are - 21.5596**
- ii) The **abnormal returns and cumulative abnormal returns** from the stock splits announcement for **91 days window period are negative.**

## **4.7 AARs for Different Window Periods from Buyback and Stock Splits**

The average abnormal returns for -5 days window period to -45 days window periods and +5 days window period to +45 days window periods are compared with the average abnormal returns for -1 day window period and +1 day window period respectively to assess the trend in the average abnormal returns over different window periods. The average abnormal returns, similarly, for different plus window periods are compared with the average abnormal returns for different corresponding minus window periods to ascertain whether average abnormal returns for different plus window periods differ from the different corresponding minus window periods. The average abnormal returns for different plus and minus window periods are also analyzed to ascertain whether average abnormal returns for shorter window periods differ from the longer window periods and vice versa.

#### 4.7.1 Analysis and Interpretation of AARs for Different Window Periods from Buyback

The average abnormal returns for different window periods from the announcement of stock buyback have been analyzed and interpreted as in the following;

##### 1) Pre announcement Period (-1 to -45 days Window periods)

##### a) Difference in AARs from -1 to -45 days Window Periods

**Table No. 4. 11 a**

##### Difference in AARs from -1 to -45 days Window Periods

| Window Periods | AARs(-1WP) | AARs (-WPs) | AARs (Difference) |
|----------------|------------|-------------|-------------------|
| -1 to -5       | -0.0211    | -0.0380     | +0.0169           |
| -1 to -10      | -0.0211    | -0.0556     | +0.0345           |
| -1 to -15      | -0.0211    | -0.0531     | +0.0320           |
| -1 to -20      | -0.0211    | -0.0536     | +0.0325           |
| -1 to -25      | -0.0211    | -0.0537     | +0.0326           |
| -1 to -30      | -0.0211    | -0.0493     | +0.0282           |
| -1 to -35      | -0.0211    | -0.0446     | +0.0235           |
| -1 to -40      | -0.0211    | -0.0629     | +0.0418           |
| -1 to -45      | -0.0211    | -0.0682     | +0.0471           |

##### b) Test Statistics for difference in AARs from -1 to -45 days Window Periods

**Table No. 4. 11. b**

##### Test Statistics

##### Difference in AARs from -1 to -45 days Window Periods

| Window Periods | Mean    | Std. Deviation | t- value | p-value |
|----------------|---------|----------------|----------|---------|
| -1 to -5       | -0.0381 | 0.0557         | 1.5281   | 0.2012  |
| -1 to -10      | -0.0556 | 0.1235         | 1.4238   | 0.1882  |
| -1 to -15      | -0.0532 | 0.1535         | 1.3414   | 0.2011  |
| -1 to -20      | -0.0536 | 0.1726         | 1.3894   | 0.1808  |
| -1 to -25      | -0.0537 | 0.1561         | 1.7207   | 0.0982  |
| -1 to -30      | -0.0564 | 0.1546         | 1.9966   | 0.0553  |
| -1 to -35      | -0.0506 | 0.1652         | 1.8135   | 0.0786  |
| -1 to -40      | -0.0682 | 0.1668         | 2.5848*  | 0.0136  |
| -1 to -45      | -0.0729 | 0.1699         | 2.8780** | 0.0062  |

**Note:** \* indicates significant at 5%, \*\* indicates significant at 1%

From the above tables, it is clear that the negative average abnormal returns do not significantly differ from -1 day window period to -5, -10, -15, -20, -25, -30, and -35 days window periods. However, there is a significant difference in negative average abnormal returns between -1 day window period and -40 days and -45 days window periods at 5% and 1% level of significance respectively. **Therefore, the abnormal returns on an average do not differ significantly from -1 day window period to the rest of the minus window periods.**

**2) Post announcement Period (+1 to +45 days window periods)**

**a) Difference in AARs from +1 to +45 days Window Periods**

**Table No. 4.12. a**  
**Difference in AARs from +1 to +45 days Window Periods**

| Window Periods | AARs(+1 WPs) | AARs(+ WPs) | AARs (Difference) |
|----------------|--------------|-------------|-------------------|
| +1 to +5       | +0.0936      | -0.0327     | +0.1263           |
| +1 to +10      | +0.0936      | +0.0763     | +0.0173           |
| +1 to +15      | +0.0936      | +0.0997     | -0.0061           |
| +1 to +20      | +0.0936      | +0.0643     | +0.0293           |
| +1 to +25      | +0.0936      | +0.0371     | +0.0565           |
| +1 to +30      | +0.0936      | +0.0271     | +0.0665           |
| +1 to +35      | +0.0936      | +0.0158     | +0.0778           |
| +1 to +40      | +0.0936      | -0.0002     | +0.0934           |
| +1 to +45      | +0.0936      | +0.0027     | +0.0909           |

**b) Test Statistics for difference in AARs from +1 to +45 days Window Periods**

**Table No. 4.12. b**

**Test Statistics**

**Difference in AARs from +1 to +45 days Window Periods**

| Window Periods | Mean    | Std. Deviation | t- value | p-value |
|----------------|---------|----------------|----------|---------|
| +1 to +5       | -0.0327 | 0.1887         | 0.3870   | 0.7184  |
| +1 to +10      | 0.0763  | 0.2168         | 1.1134   | 0.2944  |
| +1 to +15      | 0.0997  | 0.2486         | 1.5537   | 0.1426  |
| +1 to +20      | 0.0644  | 0.2692         | 1.0697   | 0.2982  |
| +1 to +25      | 0.0371  | 0.2518         | 0.7376   | 0.4679  |
| +1 to +30      | 0.0272  | 0.2400         | 0.6201   | 0.5400  |
| +1 to +35      | 0.0159  | 0.2347         | 0.4007   | 0.6912  |
| +1 to +40      | -0.0003 | 0.2516         | 0.0068   | 0.9946  |
| +1 to +45      | 0.0028  | 0.2852         | 0.0654   | 0.9481  |

The Table Nos. 4.12.a and 4.12.b indicate that there is no significant difference in average abnormal returns between +1 day window period and the rest of the window periods.

**Hence, there is no difference in abnormal returns between+1 day window period and the rest of the plus window periods.**

**3) Pre vis-à-vis Post announcement Period (+1 to -1 to +45 to -45 days Window Periods)**

**a) Difference in AARs from +1 to -1 to +45 to -45 days Window Periods;**

**Table No. 4.13. a**

**Difference in AARs from +1 to -1 to +45 to -45 days Window Periods**

| Window Periods | AARs(+WPs) | AARs(-WPs) | AARs (Difference) |
|----------------|------------|------------|-------------------|
| +1 to -1       | +0.0936    | -0.0211    | +0.1147           |
| +5 to -5       | -0.0327    | -0.0380    | +0.0053           |
| +10 to -10     | +0.0763    | -0.0556    | +0.1319           |
| +15 to -15     | +0.0997    | -0.0531    | +0.1528           |
| +20 to -20     | +0.0643    | -0.0536    | +0.1179           |
| +25 to -25     | +0.0371    | -0.0537    | +0.0908           |
| +30 to -30     | +0.0271    | -0.0493    | +0.0764           |
| +35 to -35     | +0.0158    | -0.0446    | +0.0604           |
| +40 to -40     | -0.0002    | -0.0629    | +0.0627           |
| +45 to -45     | +0.0027    | -0.0682    | +0.0709           |

**b) Test Statistics for difference in AARs from +5 to -5 to +45 to -45 days Window Periods;**

**Table No. 4.13. b**

**Test Statistics**

**Difference in AARs**

**from +5 to -5 to +45 to -45 days Window Periods**

| Window Periods | Mean    | Std. Deviation | t- value | p-value |
|----------------|---------|----------------|----------|---------|
| +5 to -5       | -0.0354 | 0.1312         | 0.8522   | 0.4162  |
| +10 to -10     | 0.0104  | 0.1846         | 0.2509   | 0.8046  |
| +15 to -15     | 0.0233  | 0.2174         | 0.5867   | 0.5620  |
| +20 to -20     | 0.0054  | 0.2311         | 0.1470   | 0.8839  |
| +25 to -25     | -0.0083 | 0.2123         | 0.2762   | 0.7836  |
| +30 to -30     | -0.0146 | 0.2045         | 0.5527   | 0.5826  |
| +35 to -35     | -0.0174 | 0.2043         | 0.7117   | 0.4791  |
| +40 to -40     | -0.0342 | 0.2149         | 1.4247   | 0.1582  |
| +45 to -45     | -0.0350 | 0.2365         | 1.4058   | 0.1633  |

The above analysis shows that the average abnormal returns for different plus window periods do not significantly differ from the average abnormal returns for different minus window periods. **Hence, the abnormal returns from the buyback announcement for different plus window periods do not significantly differ from the different minus window periods. Similarly, the abnormal returns of shorter window periods do not differ from the abnormal returns of longer window periods.**

**4) Findings**

The **abnormal returns** from the announcement of stock buyback for different **plus window periods are equal to the different corresponding minus window periods.** The **abnormal returns** similarly for the **shorter window periods do not differ from the longer window periods.**

#### 4.7.2 Analysis and Interpretation of AARs for Different Window Periods from Stock Splits

The analysis and interpretation of the average abnormal returns for different window periods from the announcement of stock splits have been carried out with the help of the following tables;

##### 1) Pre announcement Period (-1 to -45 days Window Periods)

##### a) Difference in AARs from -1 to -45 days Window Periods;

**Table No. 4.14. a**  
**Difference in AARs from -1 to -45 days Window Periods**

| Window Periods | AARs(-1WP) | AARs (-WPs) | AARs (Difference) |
|----------------|------------|-------------|-------------------|
| -1 to -5       | -0.1476    | -0.5960     | +0.4484           |
| -1 to -10      | -0.1476    | -0.5880     | +0.4404           |
| -1 to -15      | -0.1476    | -0.4492     | +0.3016           |
| -1 to -20      | -0.1476    | -0.3970     | +0.2494           |
| -1 to -25      | -0.1476    | -0.3709     | +0.2233           |
| -1 to -30      | -0.1476    | -0.3944     | +0.2468           |
| -1 to -35      | -0.1476    | -0.3549     | +0.2073           |
| -1 to -40      | -0.1476    | -0.3727     | +0.2251           |
| - 1 to -45     | -0.1476    | -0.3384     | +0.1908           |

##### b) Test Statistics for difference in AARs from -1 to -45 days Window Periods;

**Table No. 4.14. b**  
**Test Statistics**  
**Difference in AARs from -1 to -45 days Window Periods**

| Window Periods | Mean    | Std. Deviation | t- value | p-value |
|----------------|---------|----------------|----------|---------|
| -1 to -5       | -0.5960 | 0.5291         | 2.5186   | 0.0655  |
| -1 to -10      | -0.5881 | 0.4120         | 4.5130** | 0.0015  |
| -1 to -15      | -0.4492 | 0.4126         | 4.2169** | 0.0009  |
| -1 to -20      | -0.3970 | 0.3758         | 4.7244** | 0.0001  |
| -1 to -25      | -0.3709 | 0.3438         | 5.3942** | 0.0000  |
| -1 to -30      | -0.3944 | 0.3442         | 6.2759** | 0.0000  |
| -1 to -35      | -0.3549 | 0.3425         | 6.1304** | 0.0000  |
| -1 to -40      | -0.3727 | 0.3296         | 7.1518** | 0.0000  |
| - 1 to -45     | -0.3384 | 0.3317         | 6.8437** | 0.0000  |

**Note: \*\* indicates significant at 1%**

The above tables denote that the negative average abnormal returns for -5, -10, -15, -20, -25, -30, -35, -40 and -45 days window periods are positive as against the negative average abnormal returns for -1 day window period which is statistically significant at 1% level of significance. However, the negative Average abnormal returns for the shorter window periods are lesser than the longer window periods. **Therefore, there are negative abnormal returns from the stock splits announcement in the pre announcement period but the negative abnormal returns for the shorter window periods are lesser than the longer window periods. Moreover, the negative abnormal returns significantly increase from the shorter window periods to the longer window periods.**

**2) Post announcement Period (+1 to +45 days Window Periods)**

**a) Difference in AARs from +1 to +45 days Window Periods;**

**Table No. 4. 15. a**

**Difference in AARs from +1 to +45 days Window Periods**

| Window Periods | AARs(+1WP) | AARs (+WPs) | AARs ( Difference) |
|----------------|------------|-------------|--------------------|
| +1 to+ 5       | -0.1669    | -0.0790     | -0.0879            |
| +1 to +10      | -0.1669    | -0.0687     | -0.0982            |
| +1 to +15      | -0.1669    | -0.1717     | +0.0048            |
| +1 to +20      | -0.1669    | -0.0965     | -0.0704            |
| +1 to +25      | -0.1669    | -0.1055     | -0.0614            |
| +1 to +30      | -0.1669    | -0.1046     | -0.0623            |
| +1 to +35      | -0.1669    | -0.1179     | -0.0490            |
| +1 to +40      | -0.1669    | -0.1416     | -0.0253            |
| +1 to +45      | -0.1669    | -0.1407     | -0.0262            |

**b) Test Statistics for difference in AARs from +1 to +45 days Window Periods;**

**Table No. 4. 15. b**

**Test Statistics**

**Difference in AARs from +1 to +45 days Window Periods**

| Window Periods | Mean    | Std. Deviation | t-value  | p-value |
|----------------|---------|----------------|----------|---------|
| +1 to +5       | -0.0790 | 0.3125         | 0.5655   | 0.6019  |
| +1 to +10      | -0.0687 | 0.2885         | 0.7534   | 0.4705  |
| +1 to +15      | -0.1717 | 0.3550         | 1.8732   | 0.0821  |
| +1 to +20      | -0.0965 | 0.3413         | 1.2644   | 0.2214  |
| +1 to +25      | -0.1056 | 0.3242         | 1.6279   | 0.1166  |
| +1 to +30      | -0.1046 | 0.3035         | 1.8883   | 0.0690  |
| +1 to +35      | -0.1179 | 0.3061         | 2.2785*  | 0.0291  |
| +1 to +40      | -0.1417 | 0.3029         | 2.9582** | 0.0052  |
| +1 to +45      | -0.1407 | 0.3083         | 3.0617** | 0.0037  |

**Note: \* indicates significant at 5%, \*\* indicates significant at 1%**

From the above analysis, it is clear that the average abnormal returns for +5, +10, +15, +20, +25 and +30 days window periods are negative as compared to +1 day window period but not significant. Moreover, the Average Abnormal Returns for +35 and +40 and +45 days window periods are also negative as against +1 day window period which is significant at 5% and 1% level of significance respectively. **Therefore, there is an increase in the negative abnormal returns for longer window periods in the post stock splits announcement period.**

**3) Pre vis-à-vis Post announcement Period (+1 to -1 to +45 to -45 days Window Periods)**

**a) Difference in AARs from +1 to -1 to +45 to -45 days Window Periods;**

**Table No. 4. 16. a**  
**Difference in AARs**  
**from +1 to -1 to +45 to -45 days Window Periods**

| Window Periods | AARs(+WPs) | AARs (-WPs) | AARs ( Difference) |
|----------------|------------|-------------|--------------------|
| +1 to -1       | -0.1669    | -0.1476     | -0.0193            |
| +5 to -5       | -0.0790    | -0.5960     | +0.5170            |
| +10 to -10     | -0.0687    | -0.5880     | +0.5193            |
| +15 to -15     | -0.1717    | -0.4492     | +0.2775            |
| +20 to -20     | -0.0965    | -0.3970     | +0.4935            |
| +25 to -25     | -0.1055    | -0.3709     | +0.2654            |
| +30 to -30     | -0.1046    | -0.3944     | +0.2898            |
| +35 to -35     | -0.1179    | -0.3549     | +0.2370            |
| +40 to -40     | -0.1416    | -0.3727     | +0.2311            |
| +45 to -45     | -0.1407    | -0.3384     | +0.1977            |

**b) Test Statistics for difference in AARs from +5 to -5 to +45 to -45 days Window Periods;**

**Table No. 4. 16. b**  
**Test Statistics**  
**Difference in AARs**  
**from +5 to -5 to +45 to -45 days Window Periods**

| Window Periods | Mean    | Std. Deviation | t - value | p-value |
|----------------|---------|----------------|-----------|---------|
| +5 to -5       | -0.3375 | 0.4920         | 2.1693    | 0.0582  |
| +10 to -10     | -0.3284 | 0.4368         | 3.3620**  | 0.0033  |
| +15 to -15     | -0.3105 | 0.4036         | 4.2126**  | 0.0002  |
| +20 to -20     | -0.2468 | 0.3857         | 4.0469**  | 0.0002  |
| +25 to -25     | -0.2382 | 0.3569         | 4.7206**  | 0.0000  |
| +30 to -30     | -0.2495 | 0.3534         | 5.4698**  | 0.0000  |
| +35 to -35     | -0.2364 | 0.3439         | 5.7524**  | 0.0000  |
| +40 to -40     | -0.2572 | 0.3353         | 6.8603**  | 0.0000  |
| +45 to -45     | -0.2396 | 0.3336         | 6.8132**  | 0.0000  |

**Note: \*\* indicates significant at 1%**

The above tables show that there is a significant difference in negative average abnormal returns for different window periods at 1% level of significance between pre and post stock splits announcements periods. The negative average abnormal returns in the post announcement period for different window periods are lesser than the negative average abnormal returns for different window periods in the pre announcement period. Similarly, the negative average abnormal returns for shorter window periods are more than the longer window periods in the pre announcement period while the negative average abnormal returns for shorter window periods are lesser than the longer window periods in the post announcement period. **Therefore, the negative abnormal returns for different plus window periods are lesser than the different corresponding minus window periods.**

#### **4) Findings**

The negative abnormal returns from the stock splits announcements for different plus window periods are **lesser than** the different corresponding minus window periods. However, the negative abnormal returns for shorter window periods are **lesser than** the longer window periods in the pre stock splits announcement period and the negative abnormal returns for shorter window periods are **more than** the longer window periods in the post stock splits announcement period.

#### **4.8 Comparison of the Findings of the Study with the Findings of the Studies in the past**

There are **no abnormal returns from the announcement of buyback of equity and stock splits in the Indian context.** The findings of the study on the abnormal returns from the announcement of **buyback** are **similar** to the findings of Young (1967) and Lars, Manor Paulsen (2011) and **contradict** the findings of Dielman et.all. (1980), Masulis, R. (1980), Dann (1981), Vermaelen (1981), Lakonishok and Vermaelen (1990), Mohanty,

Pitabas (2002), Kai, Li and William, McNally (2003), Kaur, Karamjeet and Singh, Balwinder (2003), Gupta, Amitabh (2006) and Hyderabad, R. L. (2009) on the one hand and the observations of the research work on the abnormal returns from the announcement of **stock splits contradict** the observations of Anttinini (2000), Wulff (2002), Dhar, Satyajit and Chhaochharia, Sweta (2007), Josiah, Omollo Aduda and Chemarum, Caroline S. C. (2010), Mikko, Reinikainen (2010) and Kanti Ray, Koustubh (2011) on the other.

#### **4.9 Conclusion**

There are no abnormal returns and cumulative abnormal returns from the buyback of equity and stock splits announcements. **Therefore, on the basis of the abnormal returns and the cumulative abnormal returns, the announcements of stock buyback and stock splits do not create the value for the shareholders.**

CHAPTER - 5

**CORPORATE VALUE CREATION THROUGH  
BUYBACK OF EQUITY AND STOCK SPLITS**

# **CORPORATE VALUE CREATION THROUGH BUYBACK OF EQUITY AND STOCK SPLITS**

## **5.1 Introduction**

The main objective of a profit oriented company is to earn profit for the shareholders. The increase in the profit of the company cause increase in the earnings per share, increase in the volume of trading and rise in the stock price of the company. The increase in the earnings per share, increase in the volume of trading and rise in the stock price of the company create value for the shareholders. However, now, it is difficult task before the company to create shareholder value by maintaining the profit or improving the earnings due to a number of market constraints like lack of demand, intensified competition, falling market share, saturated market, etc. Therefore, the companies, these days, adopt different financial strategies to create the value for the shareholders. Some of the widely used financial strategies to restructure the capital structure and capitalization of the company and to enhance the value of the shareholders imply buyback of equity and stock splits. The non-operational and readjusting the capital structure financial strategies such as stock buyback and stock splits produce the desired results if they are adopted and used properly in time by the good and financially strong companies. Hence, the present study, in this chapter, concentrates on the corporate value creation through buyback of equity and stock splits in order to ascertain whether buyback of equity and stock splits increase the earnings per share and the stock price and the volume of trading and the stock price respectively and thereby create the value for the shareholders.

## **5.2 Objective 3**

The third Objective of the study and the main objective of this chapter is to examine the impact of stock buyback and stock splits announcements on corporate value creation”.

## **5.3 Corporate Value Creation through Stock Buyback and Stock Splits**

The study, in this chapter, deals with corporate value creation through buyback of equity in the Section I and corporate value creation and stock splits in the Section II in order to ascertain whether stock buyback and stock splits ensure the value for the shareholders.

SECTION – I

**CORPORATE VALUE CREATION THROUGH  
BUYBACK OF EQUITY**

# **CORPORATE VALUE CREATION THROUGH BUYBACK OF EQUITY**

The announcement of buyback of equity shares signals undervaluation of stock, increase in the earnings per share, increase in the stock price and better prospects for the company in the future. In this section, the study analyzes the earnings per share of buyback companies in the Part – A and the stock price of share buyback companies in the part - B so as to ascertain whether announcement of stock buyback signals increase in the earnings per share and stock price of the company

## **PART – A EARNINGS PER SHARE ANALYSIS**

### **5.3. I.A.1 Introduction**

Earnings per share is one of the tools of measuring the operational efficiency of the company. When a company buys back its own equity shares, the number of outstanding shares decreases and the earnings per share increases. This does not indicate the improvement in either earnings or earnings per share because when the number of outstanding shares decreases, the earnings per share has to increase. Therefore, in this part, the earnings per share of the company in the year of buyback is compared with the earnings per share for the consecutive two years both before and after the announcement of buyback in order to ascertain whether announcement of stock buyback signals increase in the earnings and earnings per share of the company.

### **5.3. I.A.2 Methodology**

The methodology used in the earnings per share analysis consists of the following;

#### **1) Sample Size**

The sample size for the earnings per share analysis consists of 71 buyback programs out of 82 buyback programs (sample of the study) announced by the listed public companies.

The 11 companies have been excluded due to the non availability of data on the earnings per share for the analysis.

#### **2) Data Analysis**

The earnings per share of the companies in the year of buyback are compared with the earnings per share for the consecutive two years both before and after the announcement of buyback in order to find out the number of companies showing increase and decrease in the earnings per share to ascertain whether earnings and earnings per share of the companies have been improved after buyback.

#### **3) Test Statistics**

A large sample test statistics has been conducted at 5% and 1% level of significance to ascertain whether number of companies showing increase and decrease in the earnings per share are statistically significant.

#### **4) Hypotheses**

##### **Main Hypothesis**

H0: EPS after ABB < EPS before ABB

H1: EPS after ABB > EPS before ABB

##### **Subordinate Hypotheses;**

1) H0: EPSAABB < EPSYABB

H1: EPSAABB > EPSYABB

2) H0: EPSYABB < EPSBABB

H1: EPSYABB > EPSBABB

### 5.3. I.A.3 Analysis and Interpretation of Earnings per Share of Buyback Companies

The earnings per share of buyback companies are analyzed and interpreted for the consecutive two years both before and after the announcement in order to find out whether stock buyback signals increase in the earnings per share of the company. The following tables show the number of companies showing increase and decrease in the earnings per share and the test statistics at 5% and 1% level of significance;

**Table No. 5. 1. a**

**No. of Companies showing increase and decrease in the earnings per share for different periods surrounding the announcement of buyback**

**Sample Companies -- 71**

| Sr. No | Period                           | Increase         |    | Decrease         |    |
|--------|----------------------------------|------------------|----|------------------|----|
|        |                                  | No. of Companies | %  | No. of Companies | %  |
| 1      | EPSOYAABB to EPSYABB (> and <)   | 39               | 55 | 32               | 45 |
| 2      | EPSTYAABB to EPSYABB (> and <)   | 35               | 49 | 36               | 51 |
| 3      | EPSYABB to EPSOYBABB (> AND <)   | 47               | 66 | 24               | 34 |
| 4      | EPSYABB to EPSTYBABB (> and <)   | 47               | 66 | 24               | 34 |
| 5      | EPSOYAABB to EPSOYBABB (> and <) | 48               | 68 | 23               | 32 |
| 6      | EPSTYAABB to EPSTYBABB (> and <) | 46               | 65 | 25               | 35 |
| 7      | AEPSAABB to AEPSBABB (> and <)   | 49               | 69 | 22               | 31 |

**Table No. 5. 1. b**  
**Test Statistics**  
**Number of Companies showing increase and decrease in the**  
**Earnings per Share**

| Sr. No. |        |           |           | Test statistics | Conclusion at 5% LS             | Conclusion at 1% LS             |
|---------|--------|-----------|-----------|-----------------|---------------------------------|---------------------------------|
| 1       | Period | EPSOYAABB | EPSYABB   | 1.284           | No significant difference found | No significant difference found |
|         | Mean   | 16.13     | 18.92     |                 |                                 |                                 |
|         | SD     | 16.38     | 22.59     |                 |                                 |                                 |
| 2       | Period | EPSTYAABB | EPSYABB   | 1.696           | No significant difference found | No significant difference found |
|         | Mean   | 15.62     | 18.89     |                 |                                 |                                 |
|         | SD     | 19.33     | 22.57     |                 |                                 |                                 |
| 3       | Period | EPSYABB   | EPSOYBABB | 2.162           | Reject                          | No significant difference found |
|         | Mean   | 18.89     | 14.10     |                 |                                 |                                 |
|         | SD     | 22.57     | 16.37     |                 |                                 |                                 |
| 4       | Period | EPSYABB   | EPSTYBABB | 2.787           | Reject                          | Reject                          |
|         | Mean   | 18.89     | 12.27     |                 |                                 |                                 |
|         | SD     | 22.57     | 15.75     |                 |                                 |                                 |
| 5       | Period | EPSOYAABB | EPSOYBABB | 1.136           | No significant difference found | No significant difference found |
|         | Mean   | 16.13     | 14.10     |                 |                                 |                                 |
|         | SD     | 16.38     | 16.37     |                 |                                 |                                 |
| 6       | Period | EPSTYAABB | EPSTYBABB | 1.681           | No significant difference found | No significant difference found |
|         | Mean   | 15.62     | 12.27     |                 |                                 |                                 |
|         | SD     | 19.33     | 15.75     |                 |                                 |                                 |
| 7       | Period | AEPSAABB  | AEPSBABB  | 1.644           | No significant difference found | No significant difference found |
|         | Mean   | 15.92     | 13.18     |                 |                                 |                                 |
|         | SD     | 16.78     | 15.56     |                 |                                 |                                 |

The above tables indicate the following;

- 1) There is a significant increase in the earnings per share in the year of announcement of buyback as compared to the earnings per share one year before the announcement of buyback at 5% level of significance.
- 2) The earnings per share in the year of announcement of buyback increased significantly at 1% level of significance over the earnings per share two years before announcement of buyback.

- 3) There is no significant increase in the earnings per share one year and two years after the announcement of buyback as against the earnings per share in the year of announcement of buyback. This indicates that the buyback does not signal and ensure improvement in the earnings and operational efficiency of the company in the future.
- 4) The earnings per share and average earnings per share after the announcement of buyback did not increase significantly as compared to the earnings per share and average earnings per share before the announcement of buyback.

### **5.3. I.A.4 Findings**

**The announcement of buyback of shares indicates an increase in the earnings per share of the company. However, it does not signal either increase in the earnings or improvement in the operational efficiency of the company in the future.** The finding of the study on the earnings per share contradicts the findings of **Mishra, A. K. (2005)**. Similarly, the findings on earnings and operational efficiency in the future contradict the findings of **Jariwala, Pournima (2011)**.

## PART – B

### STOCK PRICE ANALYSIS

#### **5.3. I.B.1 Introduction**

The performance of the company reflects on the share price. Sometimes, the performance and the fundamentals of the company are good but the share price does not do well in the market. In this situation, the company may announce the stock buyback to signal the undervaluation of stock and better prospects for the company in the future. If the company announces the buyback of equity, the stock price of the company moves upward. The rise in the stock price results in the capital appreciation and the capital gains to the shareholders. This ensures the abnormal returns and creates the value for the shareholders. The study, hence, in the part – B, stock price analysis of the section I compares the stock price after the announcement of buyback with the stock price before the announcement for the consecutive two years so as to find out whether announcement of buyback increases the stock price and creates the value for the shareholders.

#### **5.3. I.B.2 Methodology**

The following methodology is adopted for the stock price analysis of buyback companies

##### **1) Sample Size**

The sample size for the share price analysis includes 62 buyback programs out of 82 buyback programs (sample of the study) announced by the companies during the period under the study. The 20 companies have been excluded from the stock price analysis due to the non availability of the data.

##### **2) Data Analysis**

This study compares the stock price on the day of the announcement of buyback with the mean stock price for a period of six months, one year, one and half years and two years

i.e., for a period of two years both before and after the announcement of buyback and the stock price after the announcement of buyback with the stock price before the announcement for a period of two years in order to find out the number of companies showing increase and decrease in the stock price so as to ascertain whether announcement of stock buyback signals the rise in the stock price.

### **3) Test Statistics**

A large sample test statistics has been conducted at 5% and 1% level of significance to find out whether number companies showing increase and decrease in the share price are statistically significant.

### **4) Hypotheses**

#### **Main hypothesis;**

H0: SP after ABB < SP before ABB

H1: SP after ABB > SP before ABB

#### **Subordinate Hypotheses;**

1) H0: SPAABB < SPOTDABB

H1: SPAABB > SPOTDABB

2) H0: SPOTDABB < SPBABB

H1: SPOTDABB > SPBABB

### **5.3. I.B.3 Analysis and Interpretation of Stock Price of Buyback Companies**

The number of companies showing increase and decrease in the mean stock price and the test statistics at 5% and 1% level of significance are shown in the following tables;

**Table No. 5. 2. a**

**No. of Companies showing increase and decrease in the stock k price  
for different periods surrounding the announcement of buyback**

**Sample Companies-- 62**

| Sr. No. | Period                              | Increase         |    | Decrease         |    |
|---------|-------------------------------------|------------------|----|------------------|----|
|         |                                     | No. of Companies | %  | No. of Companies | %  |
| 1       | SPSMAABB to SPOTDABB<br>(> and <)   | 39               | 63 | 23               | 37 |
| 2       | SPOYAABB to SPOTDABB<br>(> and <)   | 39               | 63 | 23               | 37 |
| 3       | SPOHYAABB to SPOTDABB<br>(> and <)  | 39               | 63 | 23               | 37 |
| 4       | SPTYAABB to SPOTDABB<br>(> and <)   | 40               | 65 | 22               | 35 |
| 5       | SPOTDABB to SPSMBABB<br>(> and <)   | 30               | 48 | 32               | 52 |
| 6       | SPOTDABB to SPOYBABB<br>(> and <)   | 30               | 48 | 32               | 52 |
| 7       | SPOTDABB to SPOHYBABB<br>(> and <)  | 28               | 45 | 34               | 55 |
| 8       | SPOTDABB to SPTYBABB<br>(> and <)   | 27               | 44 | 35               | 56 |
| 9       | SPSMAABB to SPSMBABB<br>(> and <)   | 35               | 56 | 27               | 44 |
| 10      | SPOYAABB to SPOYBABB<br>(> and <)   | 33               | 53 | 29               | 47 |
| 11      | SPOHYAABB to SPOHYBABB<br>(> and <) | 32               | 52 | 30               | 48 |
| 12      | SPTYAABB to SPTYBABB<br>(> and <)   | 34               | 55 | 28               | 45 |

**Table No. 5. 2. b**  
**Test Statistics**  
**Number of Companies showing increase and decrease in the**  
**Stock Price**

| Sr. No. |        |           |           | Test statistics | Conclusion at 5% LS             | Conclusion at 1% LS             |
|---------|--------|-----------|-----------|-----------------|---------------------------------|---------------------------------|
| 1       | Period | SPSMAABB  | SPOTDABB  | 1.544           | No significant difference found | No significant difference found |
|         | Mean   | 162.50    | 148.63    |                 |                                 |                                 |
|         | SD     | 183.254   | 150.344   |                 |                                 |                                 |
| 2       | Period | SPOYAABB  | SPOTDABB  | 2.193           | Reject                          | No significant difference found |
|         | Mean   | 174.13    | 148.63    |                 |                                 |                                 |
|         | SD     | 192.599   | 150.344   |                 |                                 |                                 |
| 3       | Period | SPOHYAABB | SPOTDABB  | 2.753           | Reject                          | Reject                          |
|         | Mean   | 185.95    | 148.63    |                 |                                 |                                 |
|         | SD     | 203.593   | 150.344   |                 |                                 |                                 |
| 4       | Period | SPTYAABB  | SPOTDABB  | 3.206           | Reject                          | Reject                          |
|         | Mean   | 195.16    | 148.63    |                 |                                 |                                 |
|         | SD     | 210.958   | 150.344   |                 |                                 |                                 |
| 5       | Period | SPOTDABB  | SPSMBABB  | 2.023           | Reject                          | No significant difference found |
|         | Mean   | 148.63    | 163.84    |                 |                                 |                                 |
|         | SD     | 150.344   | 166.326   |                 |                                 |                                 |
| 6       | Period | SPOTDABB  | SPOYBABB  | 2.537           | Reject                          | No significant difference found |
|         | Mean   | 148.63    | 176.13    |                 |                                 |                                 |
|         | SD     | 150.344   | 188.574   |                 |                                 |                                 |
| 7       | Period | SPOTDABB  | SPOHYBABB | 2.548           | Reject                          | No significant difference found |
|         | Mean   | 148.63    | 183.69    |                 |                                 |                                 |
|         | SD     | 150.344   | 203.860   |                 |                                 |                                 |
| 8       | Period | SPOTDABB  | SPTYBABB  | 2.630           | Reject                          | No significant difference found |
|         | Mean   | 148.63    | 181.85    |                 |                                 |                                 |
|         | SD     | 150.344   | 191.212   |                 |                                 |                                 |
| 9       | Period | SPSMAABB  | SPSMBABB  | 0.143           | No significant difference found | No significant difference found |
|         | Mean   | 157.81    | 159.15    |                 |                                 |                                 |
|         | SD     | 182.202   | 165.856   |                 |                                 |                                 |
| 10      | Period | SPOYAABB  | SPOYBABB  | 0.184           | No significant difference found | No significant difference found |
|         | Mean   | 169.12    | 170.98    |                 |                                 |                                 |
|         | SD     | 191.600   | 187.798   |                 |                                 |                                 |
| 11      | Period | SPOHYAABB | SPOHYBABB | 0.188           | No significant difference found | No significant difference found |
|         | Mean   | 180.51    | 178.30    |                 |                                 |                                 |
|         | SD     | 202.575   | 202.962   |                 |                                 |                                 |
| 12      | Period | SPTYAABB  | SPTYBABB  | 0.935           | No significant difference found | No significant difference found |
|         | Mean   | 189.45    | 176.47    |                 |                                 |                                 |
|         | SD     | 210.055   | 190.540   |                 |                                 |                                 |

The Table Nos.5. 2. a and 5. 2. b depict the following;

- 1) The stock price significantly increased at 1% level of significance after the announcement of buyback as compared to the stock price on the day of the announcement of buyback.
- 2) There is no significant increase in the stock price on the date of the announcement of buyback as against the stock price before the announcement of buyback at 5% level of significance.
- 3) The mean stock price for two years after the announcement of buyback does not increase significantly as compared to the mean stock price for two years before the announcement of buyback..

### **5.3. I.B.4 Findings**

There is an increase in the stock price after the announcement of buyback as against the stock price on the day of the announcement while, on the contrary, there is no significant increase in the stock price after the announcement of buyback as compared to the stock price before the announcement. **The announcement of the stock buyback, therefore, signals an increase in the stock price and undervaluation of stock and creates the value for the shareholders.** The findings of the study on the stock price analysis are **similar** with the findings of the study conducted by Mohanty, Pitabas (2002), Kaur, Karamjeet and Singh, Balwinder (2003), Gupta, Amitabh (2006) and Jariwala, Pournima (2011) and **contradict** the research findings of Dielman et.all (1980), Vermaelen (1981) and Puri, Neena (2001).

### **5.3. I Conclusion**

The announcement of stock buyback signals increase in the earnings per share and the stock price of the company. However, it does not indicate the improvement in the earnings and operational efficiency of the company. **Therefore, it can be concluded that the announcement of buyback of equity increases the earnings per share and the stock price of the company and creates the value for the shareholders.**

SECTION – II

**CORPORATE VALUE CREATION AND STOCK SPLITS**

# **CORPORATE VALUE CREATION AND STOCK SPLITS**

The announcement of stock splits indicates increase in the number of outstanding shares, decrease in the market price of the share, increase in the volume of trading, rise in the stock price, decrease in the earnings per share and better prospects for the company in the future. This research work, in the Section – II, analyzes the volume of trading in the Part – C and the stock price in the Part – D in order to ascertain whether announcement of stock splits signals increase in the volume of trading and the stock price and creates the value for the shareholders.

## **PART - C**

### **VOLUME OF TRADING ANALYSIS**

#### **5.3. II.C.1 Introduction**

The volume of trading, in a broader sense, rather technically, depends upon financial strength, fundamentals and fair stock price of the company. If the company is financially strong with strong fundamentals and the stock is fairly traded, the demand for the share of the company increases in the market. When the demand for the stock increases, the volume of trading increases and when the volume of trading increases, the stock price moves upward. If the stock price goes up beyond the capacity of the investors, the stock becomes costly to the investors and the volume of trading is affected. Therefore, a company normally announces the stock splits when the scrip of the company becomes costly and moves out of the popular trading zone and the volume of trading is affected. The basic purpose of announcing stock splits is to make the share cheaper and affordable to the new investors. When a company announces the stock splits, the volume of trading increases as the reduced share price becomes cheaper and affordable to the new investors.

Hence, in this study, in the part – C of the section – II, the volume of trading is assessed empirically by comparing the volume of trading on the announcement day with the mean volume of trading for a period six months, one year, one and half years and two years i.e., for a period of two years both before and after the announcement of stock splits to ascertain whether announcement of stock splits increases the volume of trading.

### **5.3. II.C.2 Methodology**

The following methodology is followed for the volume of trading analysis

#### **1) Sample Size**

The sample size for the volume of trading analysis comprises of 86 stock splits out of 90 stock splits (sample of the study) announced by the listed public limited companies. The 4 stock splits announcements have been excluded due to the non availability of the data for the analysis.

#### **2) Data Analysis**

The volume of trading is assessed empirically by comparing the volume of trading on the announcement day with the mean volume of trading for a period six months, one year, one and half years and two years i.e., for a period of two years both before and after the announcement of stock splits and the volume of trading after the announcement of stock splits with the volume of trading before the announcement for a period of two years to find out the number companies showing increase and decrease in the volume trading to determine whether announcement of stock splits increases the volume of trading.

#### **3) Test Statistics**

A large sample test statistics has been conducted at 5% and 1% level of significance to find out whether number companies showing increase and decrease in the volume trading is statistically significant.

#### 4) Hypotheses

##### **Main hypothesis;**

H0: VT after ASS < VT before ASS

H1: VT after ASS > VT before ASS

##### **Subordinate Hypotheses;**

1) H0: VTAASS < VTOTDASS

H1: VTAASS > VTOTDASS

2) H0: VTOTDASS < VTBASS

H1: VTOTDASS > VTBASS

### **5.3. II.C.3 Analysis and Interpretation of Volume of Trading of Stock Splits Companies**

The following tables exhibit the number companies showing increase and decrease in the volume of trading and the test statistics at 5% and 1% level of significance;

**Table No. 5. 3. a**

**No. of Companies showing increase and decrease in the volume of trading  
for different periods surrounding the announcement of stock splits**

**Sample Companies—86**

| Sr<br>No. | Period                                 | Increase            |    | Decrease            |    |
|-----------|--|---------------------|----|---------------------|----|
|           |  | No. of<br>Companies | %  | No. of<br>Companies | %  |
| 1         | VT SMAASS to<br>VTOTDASS<br>(> and <)  | 36                  | 42 | 50                  | 58 |
| 2         | VTOYAASS to<br>VTOTDASS<br>(> and <)   | 42                  | 49 | 44                  | 51 |
| 3         | VTOHYAASS to<br>VTOTDASS<br>(> and <)  | 42                  | 49 | 44                  | 51 |
| 4         | VTTYAASS to<br>VTOTDASS<br>(> and <)   | 45                  | 52 | 41                  | 48 |
| 5         | VTOTDASS to<br>VT SMBASS<br>(> and <)  | 67                  | 78 | 19                  | 22 |
| 6         | VTOTDASS to<br>VTOYBASS<br>(> and <)   | 70                  | 81 | 16                  | 19 |
| 7         | VTOTDASS to<br>VTOHYBASS<br>(> and <)  | 70                  | 81 | 16                  | 19 |
| 8         | VTOTDASS to<br>VTTYBASS<br>(> and <)   | 71                  | 83 | 15                  | 17 |
| 9         | VT SMAASS to<br>VT SMBASS<br>(> and <) | 73                  | 85 | 13                  | 15 |
| 10        | VTOYAASS to<br>VTOYBASS<br>(> and <)   | 76                  | 88 | 10                  | 12 |
| 11        | VTOHYAASS to<br>VTOHYBASS<br>(> and <) | 79                  | 92 | 07                  | 08 |
| 12        | VTTYAASS to<br>VTTYBASS<br>(> and <)   | 82                  | 95 | 04                  | 05 |

**Table No.5.3.b**  
**Test Statistics**  
**Number of Companies showing increase and decrease in the**  
**Volume of Trading**

| Sr. No. |        |             |             | Test statistics | Conclusion at 5% LS             | Conclusion at 1% LS             |
|---------|--------|-------------|-------------|-----------------|---------------------------------|---------------------------------|
| 1       | Period | VTSMAASS    | VTOTDASS    | 0.508           | No significant difference found | No significant difference found |
|         | Mean   | 537974.47   | 591008.20   |                 |                                 |                                 |
|         | SD     | 1681122.726 | 1350772.792 |                 |                                 |                                 |
| 2       | Period | VTOYAASS    | VTOTDASS    | 0.151           | No significant difference found | No significant difference found |
|         | Mean   | 620703.33   | 591008.20   |                 |                                 |                                 |
|         | SD     | 2266246.220 | 1350772.792 |                 |                                 |                                 |
| 3       | Period | VTOHYAASS   | VTOTDASS    | 0.483           | No significant difference found | No significant difference found |
|         | Mean   | 733892.53   | 591008.20   |                 |                                 |                                 |
|         | SD     | 3109956.985 | 1350772.792 |                 |                                 |                                 |
| 4       | Period | VTTYAASS    | VTOTDASS    | 0.582           | No significant difference found | No Significant difference found |
|         | Mean   | 781912.99   | 591008.20   |                 |                                 |                                 |
|         | SD     | 3394930.860 | 1350772.792 |                 |                                 |                                 |
| 5       | Period | VTOTDASS    | VTSMBASS    | 3.840           | Reject                          | Reject                          |
|         | Mean   | 591008.20   | 174807.13   |                 |                                 |                                 |
|         | SD     | 1350772.792 | 695044.974  |                 |                                 |                                 |
| 6       | Period | VTOTDASS    | VTOYBASS    | 4.125           | Reject                          | Reject                          |
|         | Mean   | 591008.20   | 167537.35   |                 |                                 |                                 |
|         | SD     | 1350772.792 | 700186.126  |                 |                                 |                                 |
| 7       | Period | VTOTDASS    | VTOHYBASS   | 4.285           | Reject                          | Reject                          |
|         | Mean   | 591008.20   | 143589.31   |                 |                                 |                                 |
|         | SD     | 1350772.792 | 582480.809  |                 |                                 |                                 |
| 8       | Period | VTOTDASS    | VTTYBASS    | 4.272           | Reject                          | Reject                          |
|         | Mean   | 591008.20   | 139404.81   |                 |                                 |                                 |
|         | SD     | 1350772.792 | 523263.907  |                 |                                 |                                 |
| 9       | Period | VTSMAASS    | VTSMBASS    | 2.650           | Reject                          | Reject                          |
|         | Mean   | 537974.47   | 174807.13   |                 |                                 |                                 |
|         | SD     | 1681122.726 | 695044.974  |                 |                                 |                                 |
| 10      | Period | VTOYAASS    | VTOYBASS    | 2.118           | Reject                          | Reject                          |
|         | Mean   | 620703.33   | 167537.35   |                 |                                 |                                 |
|         | SD     | 2266246.220 | 700186.126  |                 |                                 |                                 |
| 11      | Period | VTOHYAASS   | VTOHYBASS   | 1.881           | No significant difference found | No significant difference found |
|         | Mean   | 733892.53   | 143589.31   |                 |                                 |                                 |
|         | SD     | 3109956.985 | 582480.809  |                 |                                 |                                 |
| 12      | Period | VTTYAASS    | VTTYBASS    | 1.856           | No significant difference found | No significant difference found |
|         | Mean   | 781912.99   | 139404.81   |                 |                                 |                                 |
|         | SD     | 3394930.860 | 523263.907  |                 |                                 |                                 |

The above tables exhibit the following:

- 1) The volume of trading does not increase significantly after the announcement of stock splits as against the volume of trading on the day of the announcement of stock splits.
- 2) There is a significant increase in the volume of trading on the day of the announcement of stock splits as compared to the volume of trading before the announcement of stock splits at 1% level of significance.
- 3) The volume of trading increased significantly at 1% level of significance six months and one year after the announcement of stock splits vis-a-vis the volume of trading six months and one year before the announcement of stock splits. However, there is no significant difference in volume of trading one and half years and two years after the announcement of stock splits over the volume of trading one and half years and two years before the announcement of stock splits.

### **5.3. II.C.4 Findings**

The volume of trading increases on the announcement of stock splits, in the short run, up to a period of one year but it does not increase significantly one year after the announcement of stock splits as compared to the corresponding period before the announcement. **Therefore, the announcement of stock splits increases the volume of trading but the effect lasts for a period of one year.** The findings of the present study are **similar** to the findings of Josiah, Omollo Aduda and Chemarum, Caroline S. C. (2010) and Kanti Ray, Koustubh (2011) and **contradict** the findings of Isil, Sevilay Yilmaz (2003).

## PART - D

### STOCK PRICE ANALYSIS

#### **5.3. II.D.1 Introduction**

When a company announces the stock splits, the number of outstanding shares increases and the stock price is reduced by the split factor announced by the company. Thus, the stock price becomes cheaper and affordable to the new investors. Moreover, the decrease in the market price of the share attracts the new investors and increases the volume of trading of the stock and thereby the stock price goes upward. The study, therefore, in this part of the section II, investigates the stock price by comparing the stock price on the day of the announcement of stock splits with the mean stock price for a period of six months, one year, one and half years and two years i. e. for a period of two years after the stock splits announcement so as to ascertain whether stock price increases on the increased volume of trading after the announcement.

#### **5.3. II.D.2 Methodology**

The following methodology is used for the stock price analysis of stock splits companies;

##### **1) Sample Size**

The sample size for the stock price analysis consists of 86 stock splits out of 90 sample stock splits (sample of the study) announced by the listed public limited companies. The 4 companies have been excluded due to the non availability of the data for the analysis.

##### **2) Data Analysis**

The stock price of stock splits company has been analyzed by comparing the stock price on the day of the announcement of stock splits with the mean stock price for a period of six months, one year, one and half years and two years i. e. for a period of the consecutive

two years after the stock splits announcement so as to ascertain whether stock price increases on the increased volume of trading after the announcement of stock splits.

### 3) Test Statistics

A large sample test statistics has been conducted at 5% and 1% level of significance in order to find out whether number companies showing increase and decrease in the stock price is statistically significant.

### 4) Hypothesis

H0: SP after ASS < SP on the day of ASS

H1: SP after ASS > SP on the day of ASS

## 5.3. II.D.3 Analysis and Interpretation of Stock Price of Stock Splits Companies

The number of companies showing increase and decrease in the stock price after the announcement of stock splits and the test statistics at 5% and 1% level of significance are shown in the following tables;

**Table No. 5. 4. a**  
**No. of Companies showing increase and decrease**  
**in the stock price after the announcement of stock splits**  
**Sample Companies-- 86**

| Sr. No. | Period                          | Increase         |    | Decrease         |    |
|---------|---------------------------------|------------------|----|------------------|----|
|         |                                 | No. of Companies | %  | No. of Companies | %  |
| 1       | SPSMAASS to SPOTDASS (> and <)  | 31               | 36 | 55               | 64 |
| 2       | SPOYAASS to SPOTDASS (> and <)  | 29               | 34 | 57               | 66 |
| 3       | SPOHYAASS to SPOTDASS (> and <) | 29               | 34 | 57               | 66 |
| 4       | SPTYAASS to SPOTDASS (> and <)  | 30               | 35 | 56               | 65 |

**Table No. 5. 4. b**  
**Test Statistics**  
**Number of Companies showing increase and decrease in the**  
**Stock Price**

| Sr No. |        |           |          | Test Statistics | Conclusion at 5% LS             | Conclusion at 1% LS             |
|--------|--------|-----------|----------|-----------------|---------------------------------|---------------------------------|
| 1      | Period | SPSMAASS  | SPOTDASS | .581            | No significant difference found | No significant difference found |
|        | Mean   | 167.77    | 190.13   |                 |                                 |                                 |
|        | SD     | 421.57    | 358.47   |                 |                                 |                                 |
| 2      | Period | SPOYAASS  | SPOTDASS | .811            | No significant difference found | No significant difference found |
|        | Mean   | 161.05    | 190.13   |                 |                                 |                                 |
|        | SD     | 385.74    | 358.47   |                 |                                 |                                 |
| 3      | Period | SPOHYAASS | SPOTDASS | .911            | No significant difference found | No significant difference found |
|        | Mean   | 158.66    | 190.13   |                 |                                 |                                 |
|        | SD     | 365.64    | 358.47   |                 |                                 |                                 |
| 4      | Period | SPTYAASS  | SPOTDASS | .935            | No Significant Difference found | No Significant difference found |
|        | Mean   | 159.00    | 190.13   |                 |                                 |                                 |
|        | SD     | 341.66    | 358.47   |                 |                                 |                                 |

The data produced in the above tables show that there is no increase in the stock price after the announcement of stock splits as compared to the stock price on the day of the announcement of stock splits. **This indicates that the stock price did not increase in spite of the increase in the volume of trading after the announcement of stock splits.**

### **5.3. II.D.4 Findings**

The announcement of the stock splits **does not signal increase in the stock price** of the company. The finding of the study on the stock price analysis contradicts the findings of Conroy, Robert M. and Harries, Robert S. (1999) and Mikko, Reinikainen (2010).

### **5.3. II Conclusion**

There is an increase in the volume of trading on the announcement of stock splits. However, the stock price does not increase after the announcement. **Therefore, the study concludes that the announcement of stock splits increases the volume of trading but it does not create any value for the shareholders as the stock price falls.**

CHAPTER - 6  
**CONCLUSION**

## 6.1 Findings

The present research study analyzed and interpreted the abnormal returns from the announcement of stock buyback and stock splits, the earnings per share and the stock price of buyback companies and the volume trading and the stock price of stock splits companies both before and after the announcement. The findings of the study on the abnormal returns from the buyback and stock splits and the stock price of stock split companies contradict the findings of the studies carried out in the past. However, the findings of the present research work on the earnings per share, the volume of trading and the stock price of buyback companies are similar to the findings of the previous research work done by the research scholars'. Moreover, the findings of the study on the corporate value creation through buyback of equity are similar to the findings of the research work conducted by Persons (1994), Pettit (2001), Mohanty, Pitabas (2002) and Jariwala, Pournima (2011) and contradict the findings of the study carried out by Lars, Manor Paulsen (2011).

The following are findings of the study;

6.1.1 Stock buyback and stock splits announcements grew by 288 announcements and 891 announcements respectively during the period under the study. .

6.1.2 There are no abnormal returns and cumulative abnormal returns from the stock buyback announcements for 91 days window period.

6.1.3 Abnormal returns and cumulative abnormal returns from the stock splits Announcements for 91 days window period are negative.

6.1.4 Abnormal returns from the buyback of equity announcements for different plus window periods are equal to the different corresponding minus window periods.

6.1.5 Negative abnormal returns from the stock splits announcements for different plus window periods are lesser than the different corresponding minus window periods.

- 6.1.6 Buyback of equity indicates an increase in the earnings per share but it does not signal improvement in the earnings and operational efficiency of the company in the future.
- 6.1.7 Share buyback signals undervaluation of stock. However, it does not ensure abnormal returns.
- 6.1.8 There is an increase in the volume of trading on the announcement of stock splits.
- 6.1.9 There is no increase in the stock price after the announcement of stock splits.
- 6.1.10 Buyback and stock splits announcements do not create corporate value through abnormal returns.
- 6.1.11 Announcement of the buyback of shares increases the earnings per share and the stock price and thereby create the value for the shareholders
- 6.1.12 Announcement of the stock splits increases the volume of trading but it does not create any value for the shareholders as the stock price falls after the announcement.

## 6.2 Conclusion

The buyback of equity and the stock splits were allowed in India in 1998. However, the announcements of stock splits were more than the announcements of stock buyback by three folds during the period under the study. This indicates that the companies go in for stock splits rather than the stock buyback as it does not require the funds for the announcement.

There are no abnormal returns and cumulative abnormal returns from the buyback of equity and the stock splits announcements. Therefore, on the basis of the abnormal returns and cumulative abnormal returns, the announcement of stock buyback and stock splits do not create the value for the shareholders.

The announcement of stock buyback indicates increase in the earnings per share and stock price of the company. In other words, it signals increase in the proportional holding of the shareholders on the company and the undervaluation of stock. Hence, the announcement of buyback of equity creates the value for the shareholders.

There is an increase in the volume of trading on the announcement of stock splits. However, the stock price falls after the announcement in spite of the increase in the volume of trading. Therefore, the announcement of stock splits increases the volume of trading but it does not create the value for the shareholders as the stock price falls.

The study concludes that the buyback of equity and stock splits increase the earnings per share and the stock price and the volume of trading respectively and create the value for the shareholders.

## 6.3 Suggestions

The regulatory framework on the buyback of shares and stock splits is perfectly in place in India. The companies, nowadays, in India, cannot announce the stock buyback and the stock splits without complying with the provisions of the Companies Act and the regulations by the Securities and Exchange Board of India on the buyback and the stock splits till the date of buyback and stock splits. However, the present study makes the following suggestions for the proper and better use of buyback and stock splits strategies to create the value for the shareholders;

6.3.1 The company can adopt the buyback of equity strategy to reduce the number of outstanding shares to increase the earnings per share and to signal the undervaluation of stock to give the boost to the stock price in the market.

6.3.2 If the shares of the company are moving out of the popular trading range due to the decrease in the supply of shares and increase in the demand for shares on account of the buyback of equity then the company can employ stock splits strategy to split the stock to increase the supply to meet the demand and to restore the stock in the popular trading zone.

6.3.3 The buyback of equity and stock splits strategies are thus complimentary rather than competitive. Therefore, the company has to employ stock buyback and stock splits strategies depending upon its requirement to create the value for the shareholders but not to confuse the investors and the market.

## **6.4 Scope for Further Research Work**

A further research work can be carried out on the topic shareholder value creation through buyback of equity and stock splits for a longer window period and comparison period with a larger sample size. The study can also be extended with the same period or extended period to find out whether companies that announced stock buyback and stock splits ensure more returns and create more value for the shareholders than those companies which have not announced buyback and stock splits within the same industry.

The present study is conducted on the initial buyback and stock splits. Therefore, a research scholar can work on the companies with multiple buyback and stock splits and compare the abnormal returns and the shareholder value creation from the subsequent buyback and stock splits with the abnormal returns and the shareholder value creation through initial buyback and stock splits in order to ascertain whether subsequent buyback and stock splits ensure more abnormal returns and create more value for the shareholders than the initial buyback and stock splits and vice versa.

A researcher can also work on the topics related to the present study like shareholder value creation through buyback of equity – a comparative study between fixed price tender offer method and open market operation method, effects of general stock splits and reverse stock splits on the shareholder value creation – a comparative study, impact of reverse stock splits on the shareholder value creation – an empirical study and effects of general stock splits and reverse stock splits on the earnings per share of the company – a comparative study.

# **BIBLIOGRAPHY**

# BIBLIOGRAPHY

## Books

- Chakraborty, Tanupa (2008), *Buyback of shares in India*, New Delhi: New Century Publications.
- Fernandes, Pablo. (2002), *Valuation Methods and Shareholder Value Creation*, United States of America: Academic Press.
- Gupta, S.C., and Gupta, Indra (2005), *Business Statistics*, 4th rev. ed., Mumbai: Himalaya Publishing House.
- Kothari, C. R. (2004), *Research Methodology; Methods and Techniques*, 2nd rev. ed., New Delhi: Wiley Eastern Limited.
- Pandya, Faiguni (2013), *Security Analysis and Portfolio Management*, Mumbai: Jaico Publishing House, pp. 450-451.
- Singh, Preeti (2015), *Investment Management – Security Analysis and Portfolio Management*, 19th rev. ed., Mumbai: Himalaya Publishing House, pp. 87 - 88.

## Ph. D Theses (Online)

- Isil, Sevilay Yilmaz (2003), *An Analysis of Stock Splits in the Istanbul stock Exchange*, Ph.D. Thesis, Graduate School of Social Science, Middle East: Technical University.
- Jariwala, Pournima (2011), *Buyback of Shares in India through Open Market Purchase*, Ph.D. Thesis, Surat: Veer Narmad South Gujarat University.
- Lars, Manor Paulsen (2011), *Do Share Buybacks Create Value for Shareholders? , An Empirical Test of the Absolute and Relative Returns of Share Buybacks*, Denmark: Copenhagen Business School.

Mikko, Reinikainen (2010), *Effects of Stock Splits on Stock Returns; An Event Study of Finnish Companies*, Ph.D. Thesis, School of Business, Department of Accounting, Finland: Lappeenranta University of Technology.

## Articles

Conroy, Robert M., and Harris, Robert S. (1999), “Stock Splits and Price Information; The Role of Share Price”, *Financial Management*, Vol.28, No.3, (Online).

Dann (1981), “Common stock Repurchases; an analysis of Returns to Bond holders and Stock holders”, *Journal of Financial Economics*, Vol.9, No.2, pp. 113-138, (Online).

Dhar, Satyajit, and Chhaochharia, Sweta (2007), “Market Reaction around the Stock Splits and Bonus Issues; Some Indian Evidence,” at <http://ssn.com>.

Dielman, Nantell, and Wright (1980), “Price Effect of Stock Repurchasing; A Random Coefficient Regression Approach”, *Journal of Financial and Quantitative Analysis*, Vol. 15, Issue 1, pp. 175-189, (Online).

Fama, Eugene F., Fisher, Lawrence Jensen, Michael, C., and Roll Richard (1969), “The Adjustment of the Stock Prices to new Information”, *International Economic Review*, February, Vol.10, No.1, pp. 1-21, (Online).

George, Roji (2009), “Dividend behavior of Indian Firms after Share Split”, *Indian Journal of Economics and Business*, June, Vol. 8, Issue 1.

Gupta, Amitabh (2006), “Share Price Behavior around Buybacks in India”, *The IUP Journal Applied Finance*, Vol. 15, No.12, pp. 26-40.

Hyderabad, R. L. (2009), “Market Reaction to Buyback Announcements in India”, *The IUP Journal of Applied Finance*, Vol. 15, No. 12, pp.53-78.

- Josiah, Omollo Aduda, and Chemarum, Caroline S. C. (2010), "Market Reaction to Stock Splits; Empirical Evidence from the Nairobi Stock Exchange", *African Journal of Business and Management*, Vol.1, pp. 165-184, (Online)
- Kai, Li, and William, Mc Nally (2003), "The Decision to Repurchase, Announcement Returns and Insider Holdings; A Conditional Event Study", *The ICFAI Journal of Applied Finance*, Vol.9, No.6, pp. 55-70.
- Kanti Ray, Koustubh (2011), "Stock Split and Rights Issue effect on Indian Stock Market; An Empirical Study", *Indian Journal of Finance*, Vol.5, No.1, pp. 17-25.
- Kaur, Karamjeet, and Singh, Balwinder (2003), "Buyback Announcements and Stock Price Behavior-- An Empirical Study", *The ICFAI Journal of Applied Finance*, Vol.9, No.5, pp. 23-30.
- Lakonishok, and Vermaelen (1990), "Anomalous Price Around Repurchase Tender Offers" *Journal of Finance*, Vol.45, Issue.2, pp. 455-477, (Online).
- Leledakis, Pa-pioannou, Trav-los, and Tsangarakis (2009), "Stock Splits in a Neutral Transaction Cost Environment; Evidence from the Athens Stock Exchange", *Journal of Multinational Financial Management*, Vol. 19, February, pp. 12-25, (Online).
- Maji, Madan Mohan, and Rakshit, Dhananjay (2002), "Buyback of shares and the Fate of Small Investors", *The ICFAI Journal of Applied Finance*, Vol.8, No.4, pp. 89-98.
- Masulis, R. W. (1980), "Stock Repurchases by Tender Offer; An Analysis of the causes of Common Stock price changes", *Journal of Financial and Quantitative Analysis*, Vol. 35, Issue 2, pp. 305-319, (Online).
- Maureen, McNichols, and Dravid, Ajay (1990), "Stock Dividends, Stock Splits and Signaling", *The Journal of Finance*, July, Vol.XLV, No. 3, pp. 857-879, (Online).

- Mehta, Chhavi (2007), “Managerial Motives for Stock Splits; Survey based Evidence from India”, (Online).
- Mishra, A. K. (2005), “An Empirical Analysis of Share Buyback in India”, *The ICAI Journal of Applied Finance*, Vol. 11, No.5, pp. 5-24.
- Mohanty, Pitabas (2002), “Who gains in Share Buyback?”, *The ICAI Journal of Applied Finance*, Vol.8, No.6, pp. 19-30.
- Niini, Antti (2000), “Shareholder Wealth and Volatility Effects of Stock Splits; Some Results on data for Helsinki and Stockholm Stock Exchanges”, *Liiketaloudellinen Aikakansikiriji*, pp.37-70, (Online).
- Persons (1994), “Signaling and Takeover Deterrence with Stock Repurchases; Dutch Auction versus Fixed Price Tender Offers”, *Journal of Finance*, Vol.49, Issue 4, pp.1373-1402, (Online).
- Pettit (2001), “Is Share Buyback Right for You”, *Harvard Business Review*, Vol.79, No. 40, (On line).
- Puri, Neena (2001), “A Survey of the 14 Buybacks Announced in India till January 15, 2001”, *Investor’s Guide (February)*, *The Economic Times*, Mumbai: India.
- Stewart, Jr. (1976), “Should a Corporation Repurchase its Own Stock”, *Journal of Finance*, Vol.31, Issue 3, pp. 911-921.
- Vermaelen, Theo (1981), “Common Stock Repurchases and Market Signaling-An Empirical Study”, *Journal of Financial Economics*, Vol.9, pp.139-183, (Online).
- Wulff, Christian (2002), “The Market Reaction to Stock Splits- Evidence from Germany”, *Schmalenbach Business Review*, Vol.54, pp.270-297, (Online).
- Yague, Jose, Gomez, Sala, Carlos, J, Poveda, Fuentes, and Francisco (2009), “Stock Split Size, Signaling and Earnings Management; Evidence from the Spanish Market”, *Global Finance Journal*, Vol.20, Issue 1, pp.31-47, (Online).

Young (1967), “The Performance of Common Stock subsequent to Repurchase”,  
*Financial Analyst Journal*, Vol.23, No.5, pp.117-121, (Online).

## **Websites**

[www.bseindia.com](http://www.bseindia.com)

www.gogal.com

www.moneycontrol.com

www.motilaloswal.com

www.nseindia.com

www.sebi.gov.in

www.sharekhan.com

# APPENDICES

**Appendix – A**  
**Abnormal Returns from 64 Buyback Companies**  
**91 days Window Period**

| <b>Cos.</b> | <b>1</b>  | <b>2</b>  | <b>3</b>  | <b>4</b>  | <b>5</b>  | <b>6</b>  | <b>7</b>  | <b>8</b>  | <b>9</b>  | <b>10</b> | <b>11</b> | <b>12</b> | <b>13</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | -1.2      | -0.16     | 1.3       | 0.11      | -0.48     | 0.25      | -0.47     | -0.48     | 3.91      | 1.4       | 0         | -0.46     | -0.19     |
| <b>-44</b>  | -1.42     | 0.88      | 0.67      | 0.16      | -0.25     | 0.15      | 0.11      | 1.24      | -0.05     | -1.67     | 0.12      | -0.3      | 0.15      |
| <b>-43</b>  | -1.26     | -0.53     | -0.84     | 0.24      | -0.02     | 0.55      | 0.32      | -0.62     | -0.76     | 2.33      | 0.34      | -0.32     | 1.67      |
| <b>-42</b>  | -1.69     | 0.19      | -0.91     | 0.24      | 0.94      | 0.23      | -0.65     | -0.08     | -1.88     | 0.08      | -0.67     | -0.14     | -0.64     |
| <b>-41</b>  | -0.81     | -0.12     | -0.84     | 0.16      | 1.44      | 0.28      | 2.51      | -0.45     | 1.74      | 1.35      | 0.48      | -0.22     | -1.46     |
| <b>-40</b>  | -1.09     | 0.16      | -0.15     | 0.16      | 0.15      | 0.23      | -0.19     | -0.23     | -0.93     | 0.46      | -1.01     | -0.58     | 0.23      |
| <b>-39</b>  | -1.42     | 0.16      | -0.33     | 0.15      | -0.48     | 0.26      | 1.01      | -0.25     | 3.25      | 0.41      | 0.48      | 0.34      | 0.23      |
| <b>-38</b>  | -1.2      | 0.07      | -0.78     | 0.15      | 0.05      | 0.32      | -0.19     | 0.26      | -3.22     | -1.8      | -0.82     | -0.72     | -0.92     |
| <b>-37</b>  | -1.2      | 0.13      | 0.1       | 0.11      | 0.48      | 0.3       | 0.2       | -0.4      | -0.05     | 3.89      | -0.61     | 0.1       | 0.88      |
| <b>-36</b>  | -1.37     | 0.24      | 0.23      | 0.13      | -1.05     | 0.22      | 0.41      | -0.16     | -0.05     | 0.89      | -0.04     | -0.36     | -0.19     |
| <b>-35</b>  | -1.37     | 0.19      | -0.44     | 0.13      | 0.91      | 0.26      | 0.7       | -0.16     | -0.92     | 1.4       | -0.01     | -0.12     | -0.02     |
| <b>-34</b>  | -0.92     | 0.19      | -0.18     | 0.18      | 0.33      | 0.27      | 0.49      | -0.12     | 1.74      | 0.38      | 0.17      | 0.42      | 0         |
| <b>-33</b>  | -1.37     | 0.25      | -0.26     | 0.12      | 2.6       | 0.17      | 0.92      | -0.4      | -1.71     | 0.16      | -0.68     | -0.58     | -0.02     |
| <b>-32</b>  | -1.14     | 0.07      | 0.49      | 0.17      | 0.53      | 0.32      | 1.01      | -0.75     | 0.75      | 1.17      | -0.43     | -0.33     | -0.18     |
| <b>-31</b>  | -1.48     | 0.13      | 0.45      | 0.16      | 0.07      | 0.25      | 0.45      | 0.15      | -0.05     | -0.29     | 1.09      | -0.16     | 1.76      |
| <b>-30</b>  | -1.26     | -0.28     | -0.58     | 0.2       | -0.25     | 0.25      | 0.32      | -1.74     | -0.05     | 0.41      | -0.37     | -0.53     | -1.04     |
| <b>-29</b>  | -1.2      | -0.86     | 1.02      | 0.15      | 0.16      | 0.26      | 0.53      | -0.43     | -0.49     | 0.67      | -0.06     | -1.34     | 0.02      |
| <b>-28</b>  | -1.31     | 0.32      | 0.27      | 0.17      | 0.2       | 0.28      | 0.36      | 0.23      | -1        | -0.6      | 0.34      | -0.06     | 1.81      |
| <b>-27</b>  | -1.37     | 0.68      | -0.3      | 0.11      | 0.72      | 0.29      | -0.06     | -0.82     | 3.19      | -0.35     | -0.04     | -0.16     | -1.6      |

|            |       |       |       |      |       |       |       |       |       |       |       |       |       |
|------------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>-26</b> | -1.9  | 0.38  | 0.77  | 0.14 | -0.09 | 0.12  | 0     | -0.47 | -2.24 | -0.43 | -0.05 | 0.66  | 0.56  |
| <b>-25</b> | -1.26 | 0.99  | -0.5  | 0.16 | -0.42 | 0.26  | 1.08  | 0.14  | -0.05 | 0.23  | -0.24 | 0     | -0.61 |
| <b>-24</b> | -0.18 | 0.25  | -0.9  | 0.11 | -0.26 | -0.03 | -0.8  | 0.6   | -0.05 | 0.36  | -0.33 | -0.41 | 1.23  |
| <b>-23</b> | -0.43 | 0.22  | -1.11 | 0.15 | -0.28 | 0.14  | 1.5   | -0.23 | -1.51 | -0.43 | -0.11 | 0.84  | -0.59 |
| <b>-22</b> | -1.37 | -0.04 | 2.14  | 0.1  | 0.85  | 0.02  | -0.7  | -0.25 | 2.52  | 0.01  | -0.07 | -0.31 | -0.05 |
| <b>-21</b> | -1.14 | 0.16  | 0.59  | 0.16 | 0.97  | 0.25  | 0.22  | 0.16  | 0.22  | 0.27  | -0.07 | -0.94 | -1.12 |
| <b>-20</b> | -2.15 | -0.07 | 0.65  | 0.06 | -0.09 | 0.24  | 0.26  | 0.19  | 1.68  | 0.01  | 0.04  | 0.31  | -0.42 |
| <b>-19</b> | -1.26 | -0.06 | -1.81 | 0.2  | 0.29  | 0.31  | -0.84 | -0.07 | -0.86 | 0.07  | 0.08  | -0.21 | -0.98 |
| <b>-18</b> | -0.01 | 0.02  | -0.3  | 0.2  | -0.27 | 0.26  | 0.02  | 0.71  | -0.58 | 0.71  | -0.22 | -0.48 | 2.05  |
| <b>-17</b> | -2.11 | 0.24  | 0.07  | 0.01 | 0.13  | 0.33  | 0.97  | -0.11 | -0.32 | -0.09 | -0.11 | -0.98 | 0.98  |
| <b>-16</b> | 0.27  | 0.16  | 0.43  | 0.01 | 0.16  | 0.31  | 0.45  | -0.75 | -2.72 | -0.24 | -0.18 | -0.73 | 0.71  |
| <b>-15</b> | -2.13 | 0.02  | 0.31  | 0.09 | -0.73 | 0.19  | -1    | 0.19  | 1     | -0.57 | -0.18 | -0.54 | 0.24  |
| <b>-14</b> | -0.9  | 0.1   | 0.06  | 0.09 | -1.44 | 0.13  | 1.39  | -1.42 | 1.02  | -0.78 | 0.25  | -0.17 | 1.35  |
| <b>-13</b> | -0.52 | 0.52  | 0.9   | 0.09 | -0.63 | 0.25  | -0.84 | -0.27 | -0.4  | 0.44  | -0.06 | 0.89  | -0.85 |
| <b>-12</b> | -1.07 | 0.13  | 0.53  | 0.09 | -2.07 | 0.19  | 0.29  | -0.16 | -0.05 | -0.14 | 0.01  | -0.05 | -0.61 |
| <b>-11</b> | -1.74 | 0.22  | 0.55  | 0.09 | -1.37 | 0.18  | 0.06  | 0.36  | 0.84  | -0.56 | -0.04 | 0.13  | 0.8   |
| <b>-10</b> | -1.56 | 0.68  | -0.08 | 0.18 | -0.55 | 0.3   | -1.82 | -0.47 | 1.68  | 2.27  | -0.41 | 0.42  | -0.09 |
| <b>-9</b>  | -1.14 | -0.01 | 0.41  | 0.18 | -0.68 | 0.2   | 1.43  | -0.25 | -1.74 | -0.68 | -0.08 | -0.5  | 1.55  |
| <b>-8</b>  | -0.76 | 0.28  | 0.28  | 0.14 | 0.08  | 0.32  | 1.36  | -0.27 | -0.67 | -1.38 | -0.03 | 0.51  | -0.79 |
| <b>-7</b>  | -1.01 | 1.23  | 0.1   | 0.19 | 0.64  | 0.17  | 0.72  | -0.3  | 3.17  | -0.04 | -0.17 | -0.37 | 0.48  |
| <b>-6</b>  | -1.19 | 0.41  | -0.75 | 0.2  | -0.18 | 0.29  | 0.46  | -0.18 | -0.05 | -2.77 | -0.03 | -0.62 | -0.33 |
| <b>-5</b>  | -1.98 | 0.16  | 0.57  | 0.17 | -0.31 | 0.15  | 0.99  | -0.25 | -1.13 | -2.78 | -0.13 | -0.05 | -0.53 |
| <b>-4</b>  | -1.38 | -0.23 | -0.03 | 0.15 | -0.62 | 0.22  | 0.79  | -0.38 | -0.59 | -2.07 | -0.22 | -0.78 | 1.65  |
| <b>-3</b>  | -0.83 | -0.28 | 0.78  | 0.12 | -0.46 | 0.2   | 1.8   | -0.03 | 1.04  | -1.21 | -0.18 | 0.06  | 1.24  |
| <b>-2</b>  | -1.01 | 0.4   | 0.07  | 0.19 | 0.23  | 0.36  | -0.69 | -0.34 | -0.77 | 0.06  | -0.26 | -0.84 | -1.44 |

|           |       |       |       |      |       |       |       |       |       |       |       |       |       |
|-----------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>-1</b> | -1.32 | 0.81  | 0.38  | 0.16 | -1.24 | 0.12  | -0.1  | -0.32 | 0.5   | 0.41  | 0.17  | -0.18 | -1.06 |
| <b>0</b>  | -2.14 | -0.24 | -0.43 | 0.14 | 1.31  | -0.02 | -0.37 | 0.27  | 0.59  | 0.24  | -0.32 | 0.08  | -0.36 |
| <b>1</b>  | 0.13  | 0.44  | -0.14 | 0.24 | 0.42  | 0.28  | 1.59  | -0.04 | -1.66 | -0.16 | -0.36 | -0.72 | 1.59  |
| <b>2</b>  | -1.32 | -0.92 | -0.28 | 0.24 | 6.79  | 0.28  | 0.69  | 0.07  | 2.17  | -0.23 | 0.11  | -0.02 | 0.74  |
| <b>3</b>  | -1.32 | -0.46 | -1.05 | 0.17 | 2.21  | 0.83  | 1.25  | 0.01  | -2.38 | -0.07 | 0.46  | 0.92  | 1.25  |
| <b>4</b>  | -1.26 | -0.38 | -0.31 | 0.14 | -4.88 | 0.47  | -0.5  | 0.35  | 5.71  | -0.52 | -0.01 | 1.9   | -1.46 |
| <b>5</b>  | -1.19 | -1.47 | 1.55  | 0.19 | -0.65 | 0.31  | 1.67  | 0.09  | 2.21  | -0.11 | 0.09  | 0.12  | 0.08  |
| <b>6</b>  | -0.61 | 0.16  | 2.08  | 0.14 | -0.05 | 0.09  | 0.95  | -0.54 | -2.25 | 0.92  | -0.19 | 0.83  | 0.5   |
| <b>7</b>  | -1.7  | 0.77  | 1.77  | 0.13 | -1.22 | 0.27  | 1.83  | 0.21  | -0.14 | 0.88  | -0.21 | 0.74  | -0.92 |
| <b>8</b>  | -1.32 | 0.29  | 0.67  | 0.14 | -0.79 | 0.12  | 2.5   | 0.63  | -2.55 | 0.43  | -0.12 | -1.31 | 1.48  |
| <b>9</b>  | -1.13 | 0.37  | 1.51  | 0.15 | -0.16 | 0.24  | -0.73 | 0.45  | -2.13 | -0.27 | -0.33 | -0.16 | 0.03  |
| <b>10</b> | -1.19 | 2.22  | 0.01  | 0.14 | -0.25 | 0.33  | 0.34  | 0.22  | 2.19  | -0.39 | -0.1  | 0.47  | 0.75  |
| <b>11</b> | -1.51 | 0.39  | 0.2   | 0.19 | -0.86 | -0.34 | 1.32  | 0.15  | 2.54  | -0.03 | -0.08 | -0.94 | -2.49 |
| <b>12</b> | -1.44 | 0.49  | 0.15  | 0.16 | -0.03 | 0.13  | 1.43  | -0.06 | 5.46  | 0.38  | -0.24 | -1.54 | 2.3   |
| <b>13</b> | -0.94 | 1.04  | 0.55  | 0.21 | -0.2  | 0.06  | 0.57  | -0.09 | 1.2   | -0.25 | -0.41 | 0.26  | -0.73 |
| <b>14</b> | -1.06 | -0.56 | 0.65  | 0.24 | 0.05  | 0.69  | -0.1  | -1.59 | 1.75  | -0.07 | -0.11 | -1.05 | 1.16  |
| <b>15</b> | -1.38 | 0.31  | -0.04 | 0.24 | 0.01  | 0.62  | 1.27  | -1.19 | -2.11 | 0.56  | -0.47 | -1.12 | -3.12 |
| <b>16</b> | -1.51 | 0.04  | -0.35 | 0.15 | 0.94  | 0.06  | 1.83  | 0.57  | 1.42  | -2.12 | 0.63  | -0.33 | 2.63  |
| <b>17</b> | -0.87 | 2.29  | -1.63 | 0.13 | -0.32 | 0.6   | 0.45  | -0.38 | -0.36 | -0.35 | 0.18  | -1.55 | -0.68 |
| <b>18</b> | -1.57 | 0.79  | 0.35  | 0.19 | 0.53  | -0.02 | 0.58  | -0.38 | -0.15 | -0.89 | 0.3   | 0.05  | 1.68  |
| <b>19</b> | -1.26 | -1.55 | -0.57 | 0.12 | -0.81 | 0.16  | 0.62  | 0.01  | -0.78 | -0.51 | -0.38 | -0.49 | 0.81  |
| <b>20</b> | -1.26 | -0.18 | 1.23  | 0.18 | 0.21  | 0.19  | 0.11  | -0.02 | 3.85  | -2.26 | -0.76 | -0.64 | -2.98 |
| <b>21</b> | -1.75 | -1    | 0.04  | 0.11 | -0.5  | 0.46  | -0.73 | 1.05  | -2.16 | 0.15  | -0.21 | -1.98 | 1.5   |
| <b>22</b> | -1.01 | 0.95  | 1.25  | 0.15 | -1.58 | 0.49  | -0.79 | 0.25  | -2.01 | 0.07  | -0.08 | 0.59  | 3.06  |
| <b>23</b> | -1.32 | 0.01  | -1.98 | 0.18 | -0.37 | 0.47  | -4.22 | -0.03 | -1.06 | -0.4  | 0.2   | -0.3  | -2.38 |

|           |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>24</b> | -1.13 | 0.07  | 0.17  | 0.19  | -0.99 | 0.47  | 1.3   | -0.61 | 3.12  | 0.72  | -0.07 | -0.7  | -2.3  |
| <b>25</b> | -1.19 | 0.46  | 0.37  | 0.19  | 1.21  | 0.25  | 0.49  | -0.44 | 2.01  | 0.53  | 0.11  | -0.7  | -2.15 |
| <b>26</b> | -1.75 | -2.6  | 0.94  | 0.09  | 0.22  | 0.17  | 1.65  | -0.6  | -1.85 | -0.66 | -0.52 | -0.04 | 1.83  |
| <b>27</b> | -1.07 | 1.02  | 0.06  | 0.13  | -0.97 | -0.02 | 5.5   | -0.17 | -0.26 | -0.18 | 0.4   | 1.68  | -1.42 |
| <b>28</b> | -0.88 | 1.04  | 0.06  | 0.12  | 0.4   | 0.41  | 0.29  | -0.22 | 0.59  | 0.23  | 0.17  | 1.12  | 0.19  |
| <b>29</b> | -1.19 | -1.03 | -0.01 | 0.18  | 2.01  | 0.24  | -0.21 | -0.75 | 1.47  | 1.52  | 0.09  | 1.21  | 1.69  |
| <b>30</b> | -1.63 | -1.19 | -0.16 | 0.09  | 4.25  | 0.45  | -0.78 | 0.35  | -4.85 | -0.67 | -0.11 | 5.31  | -1.86 |
| <b>31</b> | -0.94 | 0.01  | -0.96 | 0.09  | 1.83  | 0.38  | 1.3   | -0.25 | -3.86 | -2.12 | -0.05 | -5.14 | 2.16  |
| <b>32</b> | -1.19 | -0.61 | -0.1  | 0.15  | -0.32 | 0.5   | 1.37  | -0.03 | -3.52 | 0.81  | 0.01  | -3.69 | 0.34  |
| <b>33</b> | -1    | 0     | 0.07  | 0.24  | -2.33 | -0.06 | 1.75  | 0.11  | 8.07  | -0.3  | -0.06 | -0.78 | 0.16  |
| <b>34</b> | -0.87 | -0.07 | -0.71 | 0.24  | -2    | 0.36  | 0.24  | 0.17  | 12.71 | -1.86 | -0.14 | 0.87  | 0     |
| <b>35</b> | -1.32 | 0.34  | 0.16  | 0.09  | -0.26 | 0.66  | -0.62 | 1.94  | -1.33 | -0.06 | 0.32  | 3     | 1.48  |
| <b>36</b> | -0.86 | -0.42 | 0.28  | 0.23  | 0.51  | 0.48  | 2.14  | -1.1  | -3.72 | -1.76 | 0.27  | -0.9  | 0.26  |
| <b>37</b> | -1.32 | -0.15 | -1.2  | 0.24  | -0.39 | 0.34  | -1.01 | 0.66  | -1.04 | 2.7   | -0.1  | 0.49  | -1.15 |
| <b>38</b> | -1.12 | 0.36  | -0.25 | 0.24  | 0.05  | 0.34  | -1.94 | -0.55 | -1.45 | -1.36 | 0.12  | -0.67 | -0.2  |
| <b>39</b> | 0.85  | 0.34  | 1.78  | 0.24  | -0.19 | 0.24  | -0.77 | -1.62 | 1.27  | -0.35 | -0.01 | -1.68 | 1.22  |
| <b>40</b> | 0.82  | -0.04 | -1.05 | 0.24  | -0.76 | -0.04 | -1.07 | -1.03 | -1.13 | -1.01 | 0.01  | 1.49  | -1.39 |
| <b>41</b> | 0.85  | 0.43  | 1     | 0.01  | -1.16 | 0.41  | 0.36  | -0.33 | -0.05 | -0.5  | -0.31 | 1.35  | 0.03  |
| <b>42</b> | -1.93 | 0.46  | 0.28  | 0.01  | 1.63  | 0.18  | -0.51 | -1.24 | -1.65 | 0.26  | 0.23  | -3.18 | -0.18 |
| <b>43</b> | -1.91 | -0.2  | -0.7  | 0.01  | -0.15 | 0.2   | 0.71  | -0.2  | -0.58 | -0.32 | -0.09 | -1.99 | 2.18  |
| <b>44</b> | -2.2  | 0.16  | -0.33 | -0.15 | -0.9  | 0.21  | -0.51 | -0.82 | -0.05 | -0.47 | -0.46 | -0.6  | -0.22 |
| <b>45</b> | 0.81  | -0.19 | -0.44 | -0.15 | -0.71 | 0.03  | -0.11 | -0.3  | -0.05 | -0.22 | -0.52 | -1.19 | -0.92 |

| <b>Cos.</b> | <b>14</b> | <b>15</b> | <b>16</b> | <b>17</b> | <b>18</b> | <b>19</b> | <b>20</b> | <b>21</b> | <b>22</b> | <b>23</b> | <b>24</b> | <b>25</b> | <b>26</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | -0.21     | -2.11     | 0.26      | -1.13     | -0.06     | -0.12     | 0.08      | -0.73     | -2.61     | 0.29      | -1.28     | -1.37     | 0.77      |
| <b>-44</b>  | -1.52     | -4.65     | 0.14      | -1.32     | 0.16      | -0.35     | 0.44      | 0.25      | 1.64      | 0.63      | 1.13      | -0.28     | -0.36     |
| <b>-43</b>  | 1.49      | 3.44      | 0.28      | -0.75     | 0.02      | -0.23     | 1.19      | -0.06     | -1.66     | 0.12      | 1.53      | 0.84      | -0.8      |
| <b>-42</b>  | -0.74     | 6.1       | 0.09      | -0.41     | -0.06     | -0.21     | -0.43     | 0.31      | -1.4      | 0.45      | 0.12      | -0.32     | -1.04     |
| <b>-41</b>  | -3.74     | -0.15     | -0.01     | -0.45     | -0.22     | -0.29     | -0.97     | 0.64      | -1.2      | 0.41      | -0.57     | 0.21      | -0.92     |
| <b>-40</b>  | 2.54      | -3.3      | 0.52      | 0         | 0.17      | -0.43     | -0.23     | -0.08     | -1.02     | 0.23      | -0.25     | -0.45     | -3.26     |
| <b>-39</b>  | -3.23     | -4.74     | 0.37      | -0.15     | -0.04     | -0.22     | -0.61     | 0.16      | 2.36      | 0.4       | -0.2      | -0.25     | 4.01      |
| <b>-38</b>  | 2.04      | -1.74     | 0.29      | -0.68     | 0         | -0.21     | -0.22     | -0.72     | -1.51     | 0.02      | -0.41     | 0.27      | 2         |
| <b>-37</b>  | -0.74     | -6.25     | 0.4       | 0.25      | 0.17      | -0.17     | -0.51     | -0.21     | 2.73      | 0.24      | 0.01      | 0.06      | -1.16     |
| <b>-36</b>  | -0.74     | -4.32     | 0.3       | -1.65     | 0.02      | -0.13     | 0.33      | -0.05     | -0.32     | -0.01     | -0.04     | -1.79     | -0.05     |
| <b>-35</b>  | -0.74     | 2.97      | 0.25      | -1.19     | 0         | -0.25     | 0.6       | 0.6       | 0.38      | 0.15      | -0.1      | -0.74     | -0.64     |
| <b>-34</b>  | -0.74     | 5.24      | 0.07      | 0.37      | -0.04     | -0.3      | 0.78      | 0.64      | -1.61     | 0.21      | 0.17      | -0.71     | -0.75     |
| <b>-33</b>  | -0.74     | 5.04      | 0.36      | -0.42     | 0.2       | -0.17     | -0.73     | -0.01     | 0.87      | 0.89      | -0.98     | 1.39      | -1.53     |
| <b>-32</b>  | -0.74     | -2.54     | 0.32      | -0.69     | 0.22      | -0.11     | -0.19     | 0.93      | -2.77     | 0.37      | 0.06      | 0.4       | -0.3      |
| <b>-31</b>  | -0.74     | -3.21     | 0.26      | -0.3      | -0.07     | -0.09     | -0.12     | 0.74      | 0.62      | 0.02      | -0.31     | -2.27     | 1.86      |
| <b>-30</b>  | -0.74     | -3.1      | 0.13      | -0.1      | -0.24     | -0.32     | -0.26     | 0.72      | -1.74     | 0.45      | -0.2      | 0.06      | -0.85     |
| <b>-29</b>  | -0.63     | 2.64      | 0.25      | -0.42     | 0.02      | -0.27     | 0.29      | 0.25      | -3.5      | 0.54      | -0.46     | -1.19     | -0.75     |
| <b>-28</b>  | -2.18     | 2.74      | 0.21      | -0.24     | 0.12      | -0.21     | -0.89     | 0.06      | 2.73      | -0.15     | -0.1      | 0.54      | -0.22     |
| <b>-27</b>  | 0.42      | 2.85      | 0.14      | 0.43      | -0.02     | -0.33     | -0.37     | -0.24     | 2.69      | 0.31      | -0.04     | 0.42      | -1.5      |
| <b>-26</b>  | 5.09      | -1.76     | 0.29      | 0.94      | -0.47     | -0.23     | -0.56     | 0.72      | -0.27     | 0.37      | 0.44      | 1.35      | 1.99      |
| <b>-25</b>  | -6.54     | 1.76      | 0.24      | 0.18      | 0.47      | -0.36     | -0.4      | -0.24     | 0.77      | 0.62      | -1.62     | -0.19     | -0.38     |
| <b>-24</b>  | -0.74     | -3.06     | 0.24      | -0.01     | 0.24      | -0.38     | -0.26     | 0.03      | -1.2      | 0.16      | 0.58      | 0.11      | -2.51     |
| <b>-23</b>  | -0.47     | -3.21     | 0.24      | -0.36     | 0.18      | -0.19     | -0.17     | 0.34      | -2.73     | -0.03     | -0.04     | 0.65      | 1.08      |

|            |       |       |      |       |       |       |       |       |       |       |       |       |       |
|------------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>-22</b> | 0.37  | -3.09 | 0.24 | -0.65 | 0.41  | -0.26 | 0.08  | 0.19  | -2.42 | -0.46 | -0.04 | 0.06  | 0.01  |
| <b>-21</b> | -2.07 | -3.21 | 0.28 | -0.57 | -0.24 | -0.22 | -0.28 | -0.17 | 2.73  | -0.11 | -0.36 | -0.22 | -0.72 |
| <b>-20</b> | -1.01 | -3.32 | 0.28 | -0.26 | 0.4   | -0.2  | -0.2  | 0.49  | 2.73  | -0.33 | -0.36 | -2.27 | 2.08  |
| <b>-19</b> | -2.89 | -3.2  | 0.23 | -0.4  | 0.01  | -0.22 | -0.04 | 0     | 2.74  | -0.64 | -0.04 | 2.76  | -2.6  |
| <b>-18</b> | -0.79 | 4.68  | 0.22 | -0.56 | 0.25  | -0.09 | -0.06 | 0.25  | -0.06 | -0.01 | 0.01  | -0.26 | -0.02 |
| <b>-17</b> | -1.73 | 6.06  | 0.25 | 0.21  | 0.01  | -0.14 | -0.16 | 0.32  | 1.26  | 0.88  | -0.82 | -0.67 | 0.4   |
| <b>-16</b> | -1.39 | -6.34 | 0.25 | -0.42 | 0.02  | -0.2  | 0.14  | -0.25 | -1.71 | 0.4   | 0.22  | -0.83 | -0.52 |
| <b>-15</b> | -1.42 | 3.44  | 0.22 | -0.38 | -0.77 | -0.46 | -0.4  | 0.21  | -2.21 | -0.36 | 0.44  | -1.19 | -1.14 |
| <b>-14</b> | 0.38  | 5.21  | 0.24 | -0.6  | -0.03 | -0.35 | 0.91  | 0.5   | -3.41 | -0.68 | -0.57 | -0.83 | 0.88  |
| <b>-13</b> | -0.12 | -5.41 | 0.18 | 0.03  | 0.02  | -0.38 | -0.14 | 0     | -0.53 | -0.1  | -0.77 | -2.65 | -1.03 |
| <b>-12</b> | -3.31 | 6.02  | 0.34 | -0.28 | 0.31  | -0.21 | -0.1  | 0.58  | -1.59 | 0.21  | 0.27  | 3.23  | 1.69  |
| <b>-11</b> | 2.66  | 5.94  | 0.25 | -0.1  | -0.17 | -0.22 | 0.33  | 0.59  | 2.12  | 0.19  | 1.48  | -0.38 | -1.42 |
| <b>-10</b> | 1.12  | 6.13  | 0.22 | -0.46 | 0.21  | -0.28 | 0.55  | 0.72  | 2.24  | -0.8  | 0.02  | 1.31  | 1.62  |
| <b>-9</b>  | 2.79  | -3.86 | 0.21 | -0.24 | 0.14  | -0.3  | 0.51  | 0.7   | 2.72  | 1.27  | 0.03  | 0.74  | 3.74  |
| <b>-8</b>  | 4.76  | -6.46 | 0.21 | -0.22 | 0.35  | 0.04  | 0.33  | 0.07  | 1.31  | 2.3   | -0.6  | 0.75  | -4.05 |
| <b>-7</b>  | -1.74 | 1.73  | 0.3  | 0.27  | -0.96 | -0.03 | 0.53  | 0.65  | 0.25  | 1.07  | -0.09 | -1.19 | 0.45  |
| <b>-6</b>  | -1.71 | -3.5  | 0.23 | -0.26 | -0.56 | -0.16 | 0.98  | 0     | -0.75 | 1.97  | 0.98  | 1.08  | 0.48  |
| <b>-5</b>  | -1.06 | 1.96  | 0.28 | -0.15 | 0.99  | -0.21 | -0.97 | -0.24 | -0.19 | 1.2   | -0.26 | -0.21 | 2.32  |
| <b>-4</b>  | -2.7  | -1.71 | 0.24 | -0.11 | 0.06  | -0.46 | -0.27 | -0.24 | 0.56  | 0.03  | -0.49 | 0.89  | -0.24 |
| <b>-3</b>  | 2.63  | -3.63 | 0.24 | -0.24 | 0.32  | -0.13 | 0.51  | -0.01 | -0.07 | 0.94  | 0.27  | 0.8   | 0.26  |
| <b>-2</b>  | 4.95  | 2.41  | 0.26 | -0.15 | 0.34  | -0.39 | 0.22  | 0     | -1.51 | 0.01  | -0.2  | 0.1   | -1.06 |
| <b>-1</b>  | -4.53 | 1.68  | 0.25 | -0.64 | 0.34  | -0.24 | -1.66 | 0.72  | 1.71  | -0.13 | -0.44 | 0.02  | 0.84  |
| <b>0</b>   | 3.16  | -5.06 | 0.22 | -0.4  | -0.13 | -0.48 | -0.78 | -0.24 | -0.23 | 0.72  | 0.4   | -0.29 | -0.71 |

|           |       |       |      |       |       |       |       |       |       |       |       |       |       |
|-----------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>1</b>  | -0.74 | 5.93  | 0.2  | -0.6  | -0.26 | -0.3  | -1.07 | -0.24 | 0.47  | 0.64  | -0.79 | -0.19 | 0.39  |
| <b>2</b>  | 1.35  | -0.15 | 0.16 | -0.51 | -0.42 | -0.23 | 0.61  | 0.62  | 0.4   | 0.06  | 0.03  | 0.94  | -0.75 |
| <b>3</b>  | -4.4  | 0.11  | 0.24 | -0.61 | -0.03 | -0.1  | -1.63 | -0.73 | 0.01  | -0.06 | -0.95 | -0.11 | 0.2   |
| <b>4</b>  | -0.74 | 2.59  | 0.15 | 0.18  | 0.31  | 0.12  | 0.69  | -0.72 | 0.58  | -0.27 | -0.32 | -0.5  | -0.41 |
| <b>5</b>  | -0.74 | -5.76 | 0.25 | -0.7  | 0.02  | -0.37 | 1.21  | -0.72 | 0.47  | 0.19  | -0.37 | 0.45  | 0.08  |
| <b>6</b>  | 3.44  | 5.29  | 0.24 | -0.72 | 0.06  | -0.14 | 0.69  | 0.2   | -3.25 | 0.24  | 0.44  | 2.33  | 0.15  |
| <b>7</b>  | -1.94 | 2.96  | 0.19 | 1.39  | -0.26 | -0.4  | 0.44  | 0.24  | 2.21  | 1.14  | -0.99 | -0.8  | -0.67 |
| <b>8</b>  | -3.3  | 0.13  | 0.17 | 0.31  | -0.49 | -0.36 | -0.24 | 0.24  | 2.72  | 1.14  | 0.86  | -0.83 | 0.35  |
| <b>9</b>  | -1.46 | 2.49  | 0.2  | -0.48 | -0.14 | -0.37 | 0.39  | 0.09  | 2.71  | 0.59  | -0.38 | -0.81 | -0.22 |
| <b>10</b> | 4.77  | -3.25 | 0.21 | -0.42 | 0.06  | -0.22 | 0.3   | 0.93  | 2.22  | 0.53  | -0.72 | 0.69  | -0.81 |
| <b>11</b> | 1.54  | -0.72 | 0.21 | -0.53 | 0.12  | -0.55 | 0.07  | 0.67  | 0.37  | 0.13  | -0.49 | 1.65  | -0.84 |
| <b>12</b> | 4.68  | -5.63 | 0.27 | -0.51 | -0.06 | 0.63  | 1.17  | -1.46 | -2.29 | -0.48 | -1.39 | -0.78 | 0.4   |
| <b>13</b> | 5.11  | -0.15 | 0.04 | -0.32 | 0.22  | -0.31 | -0.22 | -0.24 | -3.49 | 0.75  | 5.26  | -0.58 | 0.6   |
| <b>14</b> | 4.65  | -3.17 | 0.25 | 0.53  | -0.14 | 0.2   | -0.47 | -0.82 | -3.2  | 0.21  | -0.01 | -0.47 | -3.43 |
| <b>15</b> | 4.74  | 5.49  | 0.23 | 0.17  | 0.31  | -0.44 | 1.02  | -0.17 | -3.45 | 0.6   | 0.82  | -0.03 | -0.5  |
| <b>16</b> | 4.68  | -3.99 | 0.25 | -0.66 | 0.27  | -0.23 | 0.53  | -0.08 | -3.45 | -0.1  | 0.21  | -0.38 | 0.12  |
| <b>17</b> | 4.35  | 0.1   | 0    | -0.36 | -0.21 | -0.23 | 0.14  | 0.69  | 2.55  | -0.16 | -0.61 | -0.41 | 2.43  |
| <b>18</b> | 2.04  | 1.69  | 0.2  | -1.04 | -0.03 | -0.24 | 0.55  | 0.42  | 1.95  | 0.2   | 2.82  | 0.2   | -0.58 |
| <b>19</b> | -2.07 | -2.45 | 0.36 | -0.53 | 0.12  | -0.19 | 0.34  | 0.26  | 2.74  | 0.75  | -1.63 | 0.1   | 0.78  |
| <b>20</b> | 0.65  | -0.15 | 0.18 | -0.54 | 0.21  | -0.18 | -0.49 | -0.06 | 1.33  | -0.01 | 0.99  | 0.18  | 0.27  |
| <b>21</b> | -0.74 | 0.1   | 0.29 | -0.29 | 0.22  | -0.06 | 0.17  | 0.32  | -2.89 | 0.12  | -1.68 | 0.81  | -0.11 |
| <b>22</b> | -0.74 | 1.95  | 0.21 | -0.14 | 0.08  | -0.35 | 0.65  | 0.26  | 2.73  | 0.17  | -0.34 | 0     | -1.58 |
| <b>23</b> | 4.13  | 0.11  | 0.09 | -0.33 | -0.03 | -0.35 | 0.58  | -0.12 | 2.7   | 0.56  | -0.34 | 0.54  | 0.15  |

|           |       |       |      |       |       |       |       |       |       |       |       |       |       |
|-----------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>24</b> | -0.74 | 0.11  | 0.26 | -0.41 | 0.36  | -0.27 | 0.08  | 0.35  | 2.7   | 0.31  | -1.21 | 2.81  | -0.77 |
| <b>25</b> | -6.06 | 0.92  | 0.16 | 0.21  | 0.33  | -0.2  | -0.08 | 1.28  | 2.73  | 0.07  | 0.07  | -0.19 | 1.55  |
| <b>26</b> | -5.24 | -2.49 | 0.11 | -0.25 | 0.02  | -0.18 | 0.34  | 0.14  | 2.74  | 0.18  | 0.07  | 2.02  | -0.31 |
| <b>27</b> | 1.7   | 1.17  | 0.29 | 0.17  | 0.32  | -0.18 | -0.08 | -1.61 | 2.5   | 0.36  | -1.57 | 1.24  | -0.02 |
| <b>28</b> | -1.91 | 2.58  | 0.18 | 0.1   | -0.64 | -0.13 | -0.57 | 0.4   | 0.14  | 1.28  | -0.27 | -1.18 | -1.47 |
| <b>29</b> | -3.87 | -3.3  | 0.35 | 0.2   | -0.14 | -0.16 | 0.36  | -0.32 | 0.15  | 2.38  | 0.88  | 1.01  | 1.19  |
| <b>30</b> | -5.91 | 6.08  | 0.38 | -0.74 | 0.5   | -0.2  | 0.17  | -0.32 | -1.41 | 1.47  | -0.86 | 0.38  | 0.15  |
| <b>31</b> | -3.11 | -0.15 | 0.25 | 0.44  | 0.01  | -0.07 | 0.72  | -0.07 | -0.38 | -2.56 | 0.27  | -2.09 | -2.03 |
| <b>32</b> | -5.4  | 0.42  | 0.34 | 0.21  | 0.32  | -0.08 | 0.59  | -1.07 | -0.89 | -0.13 | -0.2  | 0.14  | 0.05  |
| <b>33</b> | -0.06 | -6.46 | 0.19 | -0.2  | -0.04 | -0.31 | 0.3   | 0.33  | -0.88 | -0.38 | -1.48 | 0.17  | 2.05  |
| <b>34</b> | 4.95  | 6.08  | 0.27 | -0.12 | -0.06 | -0.24 | 0.4   | 0.62  | -1.21 | 0.06  | -0.26 | 1.99  | 0.62  |
| <b>35</b> | 5.11  | -0.44 | 0.38 | -0.18 | 0.23  | -0.11 | 0.01  | 0.34  | 0.32  | 0.16  | -1.25 | -1.93 | -1.64 |
| <b>36</b> | -4.18 | -5.66 | 0.36 | 0.19  | -0.4  | -0.27 | -0.04 | 0.21  | 2.69  | -0.3  | -1.21 | -3.48 | -0.58 |
| <b>37</b> | -5.13 | 3.13  | 0.4  | 0.18  | -0.15 | -0.4  | -0.21 | 0.53  | -0.05 | 0.31  | -0.2  | -1.56 | 0.2   |
| <b>38</b> | -0.74 | 2.68  | 0.25 | -0.32 | -0.67 | -0.27 | -0.01 | 0.62  | -1.43 | -0.76 | -0.2  | -0.84 | -0.98 |
| <b>39</b> | -3.99 | 1     | 0.12 | -0.19 | -0.41 | -0.25 | 0.01  | -0.24 | 0.59  | -0.57 | 0.04  | -1.01 | 0.29  |
| <b>40</b> | -0.74 | 3.14  | 0.2  | -0.46 | 0.29  | -0.27 | -0.26 | 0.26  | -1.94 | 0.11  | -0.44 | 0.11  | -0.14 |
| <b>41</b> | -0.74 | 1.37  | 0.31 | 0.13  | -0.07 | -0.27 | -0.21 | -0.2  | -0.27 | 0.07  | -0.2  | -1.98 | 1.04  |
| <b>42</b> | -0.74 | -3.09 | 0.25 | -0.83 | -0.16 | -0.35 | -0.23 | -0.56 | 0.15  | 0.17  | 1.97  | 2.6   | 0.1   |
| <b>43</b> | -5.62 | -0.15 | 0.2  | -0.5  | -0.24 | -0.27 | 0.01  | 0.32  | 0.1   | 0.02  | -1.19 | 0.16  | -3.04 |
| <b>44</b> | -6.06 | -0.15 | 0.24 | 1.12  | -0.25 | -0.37 | 0.27  | 0.3   | -2.6  | -1.4  | 2.65  | 0.37  | 0.01  |
| <b>45</b> | 4.48  | 2.9   | 0.39 | -0.53 | 0.19  | -0.13 | 0.08  | 0.05  | -1.55 | 0.61  | 0.42  | 1.3   | -0.02 |

| <b>Cos.</b> | <b>27</b> | <b>28</b> | <b>29</b> | <b>30</b> | <b>31</b> | <b>32</b> | <b>33</b> | <b>34</b> | <b>35</b> | <b>36</b> | <b>37</b> | <b>38</b> | <b>39</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | 0.16      | -0.27     | -0.01     | 3.47      | -0.05     | 0.26      | 0.02      | -0.12     | -0.17     | 0.15      | -0.75     | -0.33     | -0.02     |
| <b>-44</b>  | 0.22      | -0.83     | -2.32     | -5.95     | 0.04      | 0.3       | 0.04      | 0.26      | 0.09      | -1.13     | 0.85      | -0.55     | 0.03      |
| <b>-43</b>  | 0.16      | 0.89      | 0.44      | 4.69      | -0.04     | -2.63     | -0.06     | -0.31     | -0.3      | 2.08      | -1.72     | -0.23     | 1.24      |
| <b>-42</b>  | 0.04      | 0.25      | -0.07     | 2.75      | 0.28      | 3.7       | 0.2       | 0.22      | -0.34     | 2.23      | -5.04     | -0.23     | 0.55      |
| <b>-41</b>  | 0.23      | -0.45     | 1.22      | 4.13      | 1.26      | -0.64     | 0.07      | 0.82      | -0.03     | -1.32     | 1.24      | -0.12     | 0.4       |
| <b>-40</b>  | 0.13      | 0.19      | 4.47      | -6.74     | 1.11      | 3.32      | 0.03      | -0.04     | 0.09      | 0.18      | 4.93      | 0.65      | 0.55      |
| <b>-39</b>  | 0.2       | 0.37      | 0.39      | -6.39     | -0.03     | -0.3      | -0.02     | -0.05     | -0.05     | 0.01      | -0.87     | -0.12     | -0.22     |
| <b>-38</b>  | 0.36      | 0.14      | -0.25     | 0.51      | 0.02      | -2.03     | 0.04      | -0.01     | 0.19      | 0.1       | -0.42     | -0.01     | 0.13      |
| <b>-37</b>  | 0.43      | 0.2       | 0.4       | -6.72     | 0.32      | -4.18     | -0.11     | -0.07     | -0.05     | -0.97     | -1.45     | -0.99     | -0.32     |
| <b>-36</b>  | 0.19      | -0.85     | 0.67      | 6.9       | -0.01     | 0.76      | 0.03      | -0.02     | -0.14     | 1.18      | -2.93     | -0.76     | -1.83     |
| <b>-35</b>  | 0.02      | 0.02      | 0.74      | 5.49      | 0.31      | -0.05     | -0.17     | 0.01      | -0.17     | 0.1       | 2.85      | 0.54      | -0.54     |
| <b>-34</b>  | 0.21      | -0.27     | -0.31     | 1.42      | -0.02     | 0.97      | 0.03      | -0.02     | -0.24     | 0.12      | -1.38     | -0.33     | 0.32      |
| <b>-33</b>  | 0.37      | 0.08      | 0.37      | -5.85     | -0.11     | -3.18     | 0.03      | -0.06     | 0         | 0.07      | 0.61      | 0.22      | -0.63     |
| <b>-32</b>  | 0.3       | 0.31      | -1.35     | -2.67     | 1.07      | -0.1      | 0.29      | -0.03     | -0.12     | 0.45      | 0.01      | -0.23     | -1.18     |
| <b>-31</b>  | 0.1       | 0.86      | 1.4       | 3.74      | 0.26      | -0.28     | -0.04     | 0         | -0.29     | 0.43      | -0.75     | 0.44      | 0.5       |
| <b>-30</b>  | 0.24      | -1.2      | -0.91     | -2.18     | -0.26     | -0.13     | 0.08      | -0.02     | -0.49     | 2.27      | -0.37     | -0.23     | 1.49      |
| <b>-29</b>  | 0.24      | -0.67     | 0.52      | -3.75     | 0.87      | -1.26     | -0.07     | -0.06     | 0.14      | 2.26      | -0.32     | 0         | 1.84      |
| <b>-28</b>  | 0.49      | -0.66     | 0.4       | -2.44     | 0.13      | -0.7      | 0.17      | 0         | 0.52      | 0.37      | 0.8       | 0         | -0.84     |
| <b>-27</b>  | 0.09      | 0.3       | 0.09      | 0.05      | 0.02      | -4.25     | -0.12     | -0.04     | -0.09     | 3.35      | 0.77      | -0.23     | 1.71      |
| <b>-26</b>  | 0.31      | 0.89      | 0.42      | 0.42      | 0.19      | 1.52      | 0.16      | 0         | -0.37     | 1.1       | -0.37     | -0.23     | -0.07     |
| <b>-25</b>  | 0.05      | -0.04     | -0.12     | -0.12     | -0.21     | 0.5       | -0.07     | -0.06     | -0.04     | 3.51      | -0.6      | -0.23     | 0.63      |
| <b>-24</b>  | 0.32      | 0.55      | 0.06      | -3.95     | 0.03      | 3.95      | 0.38      | -0.02     | -0.41     | 3.93      | -1.26     | 0.45      | 1.15      |
| <b>-23</b>  | 0.06      | -1.68     | -1.08     | 4.46      | -0.04     | -0.36     | 0         | -0.02     | -0.07     | 0.1       | 3.04      | 0.23      | 1.07      |

|            |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>-22</b> | 0.3   | 1.12  | -0.89 | -2.08 | 0.6   | 1.78  | 0.09  | -0.03 | -0.29 | 0.9   | -0.43 | 1.06  | -0.91 |
| <b>-21</b> | -0.45 | 0.08  | 0.86  | 6.88  | -0.19 | 1.46  | -0.09 | -0.02 | -0.5  | 0.92  | -1.87 | -0.8  | -0.78 |
| <b>-20</b> | -0.37 | 3.06  | 0.37  | -2.4  | -0.01 | -1.38 | -0.14 | -0.07 | -0.31 | 0.93  | 0.34  | 0     | 1.03  |
| <b>-19</b> | 0.18  | -0.48 | 1.56  | -1.41 | -0.58 | 1.76  | 0     | 0.01  | -0.26 | 0.95  | 0.59  | 1.81  | 2.64  |
| <b>-18</b> | 0.27  | -0.04 | -0.97 | -2.51 | 0.76  | -0.49 | 0.59  | -0.03 | -0.21 | -0.74 | -0.37 | -2.3  | 0.72  |
| <b>-17</b> | 0.06  | -0.47 | -0.31 | -2.38 | 2.65  | 0.46  | 0.13  | -0.06 | -0.21 | 0.95  | -0.25 | 0.36  | 2.6   |
| <b>-16</b> | 0.41  | -1.52 | 1.7   | 0.15  | -0.13 | 0.09  | 0.07  | -0.03 | -0.17 | 0.05  | -0.37 | 0.25  | 0     |
| <b>-15</b> | 0.2   | 1.63  | -0.94 | -4.66 | 0.46  | -1.53 | 0.01  | -0.18 | -0.14 | 1.82  | -0.43 | -0.11 | -0.83 |
| <b>-14</b> | 0.59  | -0.16 | 0.62  | 0.17  | 0.1   | 1.27  | -0.04 | 0.06  | -0.17 | -1.11 | -0.31 | -0.58 | 0.54  |
| <b>-13</b> | 0.28  | -0.1  | -0.15 | 5.35  | -0.19 | -2.74 | 0     | 0.27  | -0.12 | -1.56 | -0.67 | -0.23 | 0.36  |
| <b>-12</b> | -0.03 | -0.94 | -0.66 | -6.72 | -0.04 | 3.06  | 0.01  | -0.52 | -0.17 | -0.23 | -0.37 | 0.13  | 1.05  |
| <b>-11</b> | 0.24  | -1.32 | 0.62  | 2.28  | 0.4   | 1.21  | 0     | 0.18  | -0.07 | 2.62  | -0.07 | -0.46 | 1.19  |
| <b>-10</b> | 0.03  | 0.97  | -1.65 | 0.15  | 0.61  | -0.09 | 0.07  | -0.05 | -0.1  | -2.37 | -0.37 | -0.8  | 1.05  |
| <b>-9</b>  | -0.1  | 1.32  | -0.31 | -2.18 | 0.14  | -0.53 | 0.01  | -0.13 | -0.14 | 1.19  | -0.55 | 0.13  | -3.89 |
| <b>-8</b>  | 0.1   | 0.02  | 0.02  | -5.71 | 0.14  | 1.4   | 0.17  | 0.04  | -0.17 | 0.39  | 2.95  | 0.37  | 0.97  |
| <b>-7</b>  | -0.01 | -0.04 | 0.98  | 6.44  | -0.16 | -0.05 | -0.09 | -0.08 | -0.14 | -2.04 | -3.26 | -0.34 | -0.09 |
| <b>-6</b>  | 0.27  | -0.29 | 0.32  | -2.12 | 0.03  | -0.39 | -0.03 | 0     | -0.34 | 0.92  | -0.43 | -1.04 | -0.48 |
| <b>-5</b>  | 0.18  | -2.02 | 0.07  | 2.48  | 0.08  | 5.68  | -0.16 | 0.05  | -0.4  | 0.1   | -0.96 | -0.23 | 1.88  |
| <b>-4</b>  | 0.35  | -0.5  | 1.28  | -2.95 | 0.55  | 1.28  | -0.17 | 0.27  | 0.06  | 0.22  | 0.84  | 0.72  | -0.1  |
| <b>-3</b>  | 0.14  | 0.31  | -1.09 | 5.22  | 0.02  | -0.83 | 0     | -0.19 | -0.32 | -1.98 | 0.24  | -0.93 | -1.53 |
| <b>-2</b>  | 0.1   | 1.79  | -0.52 | -4.57 | 0.45  | -0.39 | -0.03 | 0.04  | 0.17  | 0.49  | -0.8  | 0.01  | 2.94  |
| <b>-1</b>  | 0.34  | 0.08  | -4.52 | 2.81  | 0.06  | 0.74  | 0.07  | -0.32 | -0.14 | -0.87 | 6.38  | -0.11 | 2.92  |
| <b>0</b>   | 0.03  | -0.1  | 1.33  | 0.15  | -0.47 | -1.22 | 0.19  | 0.21  | -0.3  | 1.17  | -3.86 | 1.83  | 1.51  |
| <b>1</b>   | 0.35  | 3.5   | 2.51  | -2.98 | -0.55 | -1.67 | 0.08  | -0.03 | -0.51 | 2.21  | -1.5  | -0.71 | -0.31 |
| <b>2</b>   | 0.27  | -1.52 | 3.53  | 1.51  | 0.46  | 2.44  | 0.05  | 0.39  | -0.35 | -1.85 | -0.43 | 0.02  | 0.29  |

|           |      |       |       |       |       |        |       |       |       |       |       |       |        |
|-----------|------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| <b>3</b>  | -0.1 | -1.46 | -0.19 | 1.53  | -0.25 | -1.48  | -0.11 | 0.08  | -0.65 | -1.98 | 2.28  | -0.23 | -5.07  |
| <b>4</b>  | 0.11 | -1.92 | -0.19 | 5.33  | 0.13  | -5.59  | -0.18 | 0.03  | -0.02 | -2.06 | -2.1  | 0.02  | -1.51  |
| <b>5</b>  | 0.36 | -1.93 | -0.98 | -4.3  | -0.38 | -3.85  | 0.42  | -0.37 | 0     | -2.06 | 4.26  | -0.47 | 1.84   |
| <b>6</b>  | 0.38 | 0.41  | -1.23 | -5.48 | -0.09 | -2.05  | -0.11 | 0.02  | -0.28 | -2.08 | -4.48 | 0.88  | -0.93  |
| <b>7</b>  | 0.43 | 1.98  | -2.18 | 0.59  | 0.05  | -4.71  | 0.84  | -2.5  | -0.1  | 2.24  | 4.43  | -0.35 | -10.41 |
| <b>8</b>  | 0.06 | -0.97 | -0.08 | 0.15  | -0.15 | -4.21  | 1.2   | 0.15  | 0.15  | 2.24  | -0.37 | 0.52  | 8.62   |
| <b>9</b>  | 0.3  | -2.63 | -1.27 | 0.15  | 0.16  | 0.82   | 0.05  | 0.14  | -0.29 | 2.27  | -1.54 | 4.61  | 4.49   |
| <b>10</b> | 0.13 | -0.93 | 1.99  | 1.23  | 0.11  | 6.32   | 0.18  | -0.01 | -0.1  | 0.86  | -4.92 | 0.05  | -0.61  |
| <b>11</b> | 0.37 | -2.5  | 0.85  | -1.66 | 0.07  | 0.62   | 0.2   | -0.07 | -0.31 | -1.66 | -1.88 | 4.42  | 0.51   |
| <b>12</b> | 0.05 | 6.89  | 1.18  | 4.54  | -0.2  | -1     | -0.12 | 0.74  | 0     | -2.06 | 1.51  | 0.66  | 1.21   |
| <b>13</b> | 0.07 | 7.36  | 1.5   | -6.13 | -0.04 | -0.08  | 0.02  | 1.09  | 0.45  | -2.05 | -0.99 | -1.38 | 4.99   |
| <b>14</b> | 0.21 | -2.88 | -2.49 | 1     | 0.11  | -0.77  | 0.23  | -0.39 | -0.21 | -0.72 | 0.58  | -2.45 | 2.87   |
| <b>15</b> | 0.37 | 0.35  | -0.46 | 0.58  | -0.22 | 2.47   | 0.14  | 0.02  | -0.06 | 0.16  | -2.77 | 0.2   | 1.11   |
| <b>16</b> | 0.16 | 1.67  | -2.64 | -2.3  | 0     | -23.86 | -0.14 | 0.33  | -0.25 | 2.07  | 0.86  | 0.63  | -1.1   |
| <b>17</b> | 0.08 | -1.98 | 2.27  | 3.55  | -0.37 | 2.65   | 0.33  | -0.53 | -0.31 | 1.5   | -1.57 | -0.08 | 0.3    |
| <b>18</b> | 0.38 | 1.51  | -0.77 | 0.15  | 0.2   | 1.7    | 0.22  | -2.5  | 0.03  | -1.91 | 3.45  | -1.2  | 0.04   |
| <b>19</b> | 0.25 | -0.5  | -0.52 | 4.68  | 0.48  | 1.64   | -0.1  | -0.1  | -0.25 | -1.67 | -2.3  | -2.13 | 1.83   |
| <b>20</b> | 0.25 | 1.27  | 1.1   | -1.61 | -0.34 | -0.28  | 0.02  | -0.03 | 0.14  | -2.07 | -4.26 | 0.46  | 2.3    |
| <b>21</b> | 0.26 | -2.72 | 0.28  | -0.27 | 0.14  | 1.31   | 0.13  | -0.48 | -0.23 | -2.05 | -0.37 | -2.34 | -2.14  |
| <b>22</b> | 0.44 | 0.15  | 1.71  | 2.37  | -0.24 | 0.33   | 0.18  | -0.21 | -0.27 | 1.35  | -2.56 | -0.75 | 2.49   |
| <b>23</b> | 0.25 | 0.75  | 5.26  | 0.15  | -0.77 | -1.35  | 0.14  | -0.45 | -0.52 | 0.13  | 0.58  | -1.13 | -5.22  |
| <b>24</b> | 0.18 | 0.63  | -1.46 | 1.02  | 0.13  | 1.16   | 0.04  | -0.63 | -0.14 | 0.46  | -0.26 | 0.69  | -2.65  |
| <b>25</b> | 0.26 | 2.23  | -4    | -2.47 | -0.42 | 1.97   | 0.25  | 0.04  | -0.08 | -1.86 | -1.41 | 1.12  | 0.09   |
| <b>26</b> | 0.26 | -2.36 | 1.1   | 6.9   | -0.58 | 0.12   | -0.11 | 0.17  | -0.29 | -1.35 | -1.9  | -2.05 | 0.06   |
| <b>27</b> | 0.27 | 3.6   | 3.87  | 2.61  | 0.09  | 2.76   | 0.08  | -0.11 | -0.16 | -2.07 | -2.92 | 3.8   | 1.71   |

|           |       |       |        |       |       |       |       |       |       |       |       |        |       |
|-----------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|
| <b>28</b> | 0.28  | -3.95 | -0.43  | 4.5   | 0.32  | 0.51  | 0.43  | 0.09  | -0.18 | 1.49  | 0.13  | 1.49   | 0.6   |
| <b>29</b> | 0.34  | 3.54  | -11.31 | -4.74 | 0.12  | 2.03  | 0.02  | 0.11  | -0.14 | 2.27  | 1.19  | 1.69   | 1.15  |
| <b>30</b> | -0.06 | 0.47  | -3.01  | -4.07 | 0.09  | 1.01  | 0.02  | -0.44 | -0.2  | 1.27  | -1.49 | -0.37  | 1.41  |
| <b>31</b> | 0.49  | 0.93  | -4.12  | 6.94  | -0.24 | 9.77  | 0.15  | 0.12  | -0.42 | 2.06  | 2.61  | 1.28   | -6.09 |
| <b>32</b> | 0     | 0.41  | -1.48  | -0.33 | 0.16  | 13.05 | 0.14  | -0.14 | -0.18 | -1.76 | 1.48  | 0.54   | -3.81 |
| <b>33</b> | -0.02 | -5.38 | -4.42  | -0.89 | -0.05 | -1.8  | -0.09 | -0.18 | 0.14  | -2.06 | 0.25  | 0.55   | 1.85  |
| <b>34</b> | 0.02  | -1.28 | 0.99   | -2.7  | 0.3   | 3.17  | 0.02  | 0.14  | 0.09  | 2.27  | -0.88 | -2.31  | 1.46  |
| <b>35</b> | 0.59  | 3.36  | 1.94   | -2.57 | 0.38  | -6.28 | -0.27 | 0.3   | -0.08 | -1.92 | -1.63 | 0.53   | 0.29  |
| <b>36</b> | -0.05 | -1.42 | -0.03  | -0.01 | 0.03  | -26.5 | -0.06 | 0.41  | -0.18 | 2.18  | -3.55 | 0.54   | -2.28 |
| <b>37</b> | 0.08  | 1.89  | 1.06   | 5.4   | -0.26 | 0.08  | -0.12 | 0.27  | -0.18 | 2.25  | 0.09  | -0.68  | 0.47  |
| <b>38</b> | 0.35  | -0.18 | 0.36   | -6.74 | -0.03 | -0.32 | 0.13  | -0.2  | -0.31 | 2.26  | -0.11 | 0.39   | -0.78 |
| <b>39</b> | 0.19  | 3     | 2.36   | 1.96  | 0.75  | -0.58 | 0.19  | 0.13  | 0.04  | 0.59  | -0.94 | -0.23  | 1.14  |
| <b>40</b> | -0.07 | -2.4  | -2.9   | -1.87 | -0.08 | 2.6   | 0.18  | 0.47  | -0.2  | 2.18  | -0.68 | -1.13  | 0.56  |
| <b>41</b> | 0.38  | 1.93  | 0.53   | 6.13  | 0.25  | -1.78 | -0.04 | 0.02  | -0.22 | 0.44  | 1.16  | 1.01   | 0.52  |
| <b>42</b> | 0.18  | -0.11 | -8.44  | 3.64  | -0.24 | -1.18 | -0.11 | 0.5   | 0.11  | 2.23  | -1.15 | 0.08   | -1.75 |
| <b>43</b> | -0.04 | 3.92  | 3.17   | -6.73 | 0.41  | -0.05 | -0.18 | 0     | -0.06 | -0.33 | -0.11 | 1.04   | 2.18  |
| <b>44</b> | 0.09  | -6.12 | -3.6   | 4.25  | 0.41  | 0.23  | 0.04  | 0.18  | -0.18 | 2.24  | -0.48 | -1.16  | 1.1   |
| <b>45</b> | 0.85  | -0.71 | -0.77  | -6.72 | 0.21  | 1.63  | -0.05 | -0.05 | -0.14 | 2.27  | 59.7  | -35.22 | -0.1  |

| <b>Cos.</b> | <b>40</b> | <b>41</b> | <b>42</b> | <b>43</b> | <b>44</b> | <b>45</b> | <b>46</b> | <b>47</b> | <b>48</b> | <b>49</b> | <b>50</b> | <b>51</b> | <b>52</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | 0.05      | -0.3      | -0.07     | 0.12      | 1.02      | 0.18      | -0.12     | -0.01     | 1.31      | -0.43     | -0.92     | -0.23     | 0.46      |
| <b>-44</b>  | 0.15      | -0.94     | 0.28      | 0.06      | 0.12      | -2.65     | 0.35      | -1.22     | 0.96      | -0.4      | -0.47     | -0.24     | 3.87      |
| <b>-43</b>  | 0.63      | 0.4       | 0.31      | 0.06      | 0.57      | 2.26      | -0.35     | 0.79      | -2.11     | -0.36     | -1.08     | 0.01      | -1.1      |
| <b>-42</b>  | -0.17     | -0.41     | 0.44      | 0.79      | -3.08     | -0.6      | 0.31      | -0.27     | -1.31     | -0.37     | -1.01     | -0.37     | -0.61     |
| <b>-41</b>  | -0.2      | -0.39     | 0.05      | 1.49      | -8.88     | 0.94      | -2.69     | -0.79     | 0.01      | -0.66     | -0.75     | -0.26     | -4.52     |
| <b>-40</b>  | -0.02     | -0.63     | -0.04     | -3.19     | -0.04     | 0.23      | -0.77     | -0.53     | -0.37     | 0         | -1.28     | -0.12     | -5.99     |
| <b>-39</b>  | 0.14      | -5.12     | 0.34      | -3.3      | 2.45      | -1.9      | -1.2      | -2.12     | -0.19     | 0.23      | -0.74     | 0         | -3.87     |
| <b>-38</b>  | -0.09     | -0.62     | 0.52      | 2.92      | 0.83      | 1.46      | -0.61     | 1.91      | 0.54      | -0.35     | -0.03     | -0.64     | 5.07      |
| <b>-37</b>  | 0.03      | 0.76      | -0.2      | 1.92      | 0.32      | 1.05      | 0.27      | 0.34      | -0.15     | -0.64     | 0.21      | -0.21     | 2.89      |
| <b>-36</b>  | -0.56     | -0.76     | -0.3      | -1.12     | -2.55     | 0.14      | 0.03      | 0.17      | 0.34      | -0.6      | -1.35     | -0.37     | -3.02     |
| <b>-35</b>  | 0.14      | -0.98     | -0.55     | 1.14      | -0.96     | -0.63     | 1.05      | -1.39     | 0.43      | -0.02     | -1.63     | 0.12      | -4.98     |
| <b>-34</b>  | 0.1       | -0.37     | 0.62      | 0.18      | 1.74      | -1.63     | -0.18     | 0.16      | -0.2      | -0.18     | -1.17     | -0.25     | 0.52      |
| <b>-33</b>  | -0.49     | -0.47     | 0.62      | 0.06      | 2.89      | 2.95      | -1.33     | -0.53     | 1.42      | -0.62     | -0.35     | -0.61     | 2.28      |
| <b>-32</b>  | -0.2      | -1.94     | 0.41      | 0.06      | -1.33     | 0.4       | -0.8      | -1.37     | -0.14     | -0.31     | -0.53     | 0.09      | -4.31     |
| <b>-31</b>  | -0.13     | -0.29     | -0.19     | 0.06      | 1.36      | 0.73      | -0.77     | 0.68      | 1.05      | -0.2      | -1.03     | 0.47      | -1.66     |
| <b>-30</b>  | 0.91      | 0.21      | 0.33      | -2.26     | -0.03     | -0.66     | 0.37      | 1.22      | -1.42     | -0.54     | -0.54     | 0.11      | 6.75      |
| <b>-29</b>  | -0.07     | -0.68     | 0.35      | 2.47      | 0.66      | 0.27      | -0.77     | -1.73     | -1.94     | -0.31     | 0.29      | -0.24     | -5.18     |
| <b>-28</b>  | 0.06      | 1.65      | -0.2      | -0.18     | 1.34      | -0.24     | -0.4      | -0.18     | 0.6       | -0.22     | -0.02     | 0.04      | -1.16     |
| <b>-27</b>  | -0.16     | 1.68      | -0.38     | -1.46     | 0.03      | 0.61      | -0.53     | -1.11     | -0.18     | -0.35     | -1.61     | -0.24     | -4.52     |
| <b>-26</b>  | 0.1       | 0.17      | 0.69      | 1.86      | -0.2      | -1.09     | -0.31     | -1.34     | 0.43      | -0.67     | -2.73     | -0.66     | -0.78     |
| <b>-25</b>  | -0.19     | -0.24     | 0.07      | 0.06      | 1.06      | 0.61      | -0.96     | 0.32      | 0.51      | -0.41     | 1.78      | -0.56     | -4.9      |
| <b>-24</b>  | -0.29     | 1.69      | 0.12      | 3.87      | 1.44      | 0.18      | -0.39     | 1.71      | 0.03      | -0.32     | 2.52      | -0.17     | -3.5      |
| <b>-23</b>  | 0.54      | 0.12      | -0.36     | 0.06      | -2.67     | 0.18      | 0.28      | -0.78     | 0.18      | -0.72     | 2.26      | -0.52     | -5.05     |

|            |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>-22</b> | 0.17  | -1.48 | -0.07 | -1.92 | 2.63  | 0.18  | -0.26 | 0.86  | 0.41  | -0.41 | 0.96  | -0.3  | -1.97 |
| <b>-21</b> | -0.12 | -0.03 | -0.03 | -2.78 | 1.1   | 0.16  | -0.02 | -1.21 | 0.35  | -0.61 | 2.69  | -0.9  | 8.41  |
| <b>-20</b> | -0.5  | -1.36 | -0.37 | 2.51  | -0.59 | 0.16  | -0.65 | -0.01 | 0.13  | -0.34 | -5.47 | -0.22 | -0.55 |
| <b>-19</b> | 0.48  | -0.13 | 1.23  | -2.3  | 1.32  | 0.04  | -1.27 | -1.77 | -0.04 | -0.23 | -3.96 | -0.49 | -3.76 |
| <b>-18</b> | -0.16 | -0.87 | 1.24  | 0.18  | 1.89  | -0.36 | -0.39 | -0.51 | 0.78  | -0.48 | -0.93 | -0.16 | -4.37 |
| <b>-17</b> | -0.07 | 0.78  | 0.85  | 5.02  | 0.59  | 1.85  | 1.81  | -0.51 | 0.42  | -0.52 | -1.36 | -0.18 | 3.01  |
| <b>-16</b> | -0.09 | 0.85  | -0.17 | 0.06  | -1.81 | 1.42  | -0.02 | 1.34  | -0.1  | -0.33 | 2.62  | -0.15 | -7.36 |
| <b>-15</b> | 0.08  | 5.54  | 0.32  | 0.06  | 0.65  | 0.16  | -0.24 | 0.33  | -2.42 | 0.48  | -0.59 | -0.08 | 0.23  |
| <b>-14</b> | 0.31  | 0.98  | 0     | 1.35  | -2.59 | -0.38 | 0.36  | 1.12  | -0.2  | -0.26 | -1.85 | -0.28 | -0.84 |
| <b>-13</b> | -0.6  | 0.12  | 0.01  | -0.26 | 5.02  | 0.82  | -0.71 | -0.1  | -0.8  | -0.37 | -2.57 | -0.3  | -2.64 |
| <b>-12</b> | -0.2  | -0.62 | -0.2  | -0.89 | 0.04  | 0.63  | 0.43  | 0.17  | -0.51 | -0.23 | -1.41 | -0.22 | -0.05 |
| <b>-11</b> | 0.06  | 1.24  | -0.09 | 1.02  | -1.01 | -0.26 | 0     | 0.61  | 0.08  | -0.33 | 0.29  | -0.2  | 0.24  |
| <b>-10</b> | -0.19 | -0.21 | 0.44  | -0.89 | 1.35  | 0.18  | -0.14 | 0.35  | 0.1   | -0.49 | 0.69  | -0.25 | -4.24 |
| <b>-9</b>  | 0.14  | -1.52 | -0.46 | 0.06  | 1.28  | 0.18  | -0.27 | -0.71 | 0.06  | -0.43 | -2.33 | -0.55 | -0.55 |
| <b>-8</b>  | -0.18 | 0.69  | 0.02  | 0.13  | -1.39 | 0.38  | -0.08 | 1.46  | 0.06  | -0.55 | -1.65 | -0.24 | 1.98  |
| <b>-7</b>  | 0.02  | 0.08  | -0.27 | 1.96  | -1.9  | -0.21 | -0.21 | -3.62 | 0.48  | -0.3  | -0.5  | -0.22 | -1.64 |
| <b>-6</b>  | 0.21  | -0.98 | 0.09  | 0.06  | 1.38  | 2.12  | -0.1  | -0.44 | 0.43  | -0.26 | -1.83 | -0.07 | 2.15  |
| <b>-5</b>  | -0.02 | 4.12  | -0.44 | 0.46  | 3.92  | -0.22 | -0.03 | -1.44 | -0.19 | -0.48 | -1.96 | -0.34 | -3.48 |
| <b>-4</b>  | -0.26 | -1.62 | 0.1   | 0.32  | 0.84  | -1.12 | 0.12  | -1.25 | -0.14 | -0.43 | 1.33  | -0.26 | 1.6   |
| <b>-3</b>  | 0.21  | -3.5  | -0.94 | 2.25  | -0.42 | -0.96 | 0.13  | 2.39  | -0.5  | -0.76 | -0.22 | -0.24 | 6.66  |
| <b>-2</b>  | -0.1  | -4.94 | 1.23  | -1.93 | 0.05  | 1.33  | -0.19 | 0.16  | 0.7   | -0.33 | -0.94 | 0.06  | 2.59  |
| <b>-1</b>  | -0.34 | 3.07  | 1.23  | -0.47 | -1.27 | 0.23  | 0.34  | 0.96  | 0.2   | -0.33 | -1.63 | -0.18 | -0.46 |
| <b>0</b>   | 1.38  | -0.43 | 0.97  | -1.48 | 1.29  | 0.1   | 0.13  | 1.91  | 0.11  | -0.63 | -0.13 | -0.25 | -2.76 |
| <b>1</b>   | 0.43  | -3.41 | 0.14  | 0.45  | -0.34 | 0.3   | -1.44 | 0.65  | 0.04  | -0.76 | 1.32  | -0.3  | 0.02  |
| <b>2</b>   | 0.69  | -1.21 | 0.37  | -0.83 | -5.65 | 0.49  | -0.34 | -3.17 | 0.28  | 0.53  | -2.2  | -0.09 | 2.61  |

|           |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>3</b>  | -0.76 | 0.36  | 0.04  | 2.51  | -2.32 | 0.3   | 3.27  | 1.16  | 0.11  | -0.65 | 0.69  | -0.1  | -1.15 |
| <b>4</b>  | -1.6  | -0.43 | 0.1   | 1.47  | 1.7   | 0.16  | -0.14 | 1.57  | -0.14 | -0.6  | 1.46  | -0.97 | 2.44  |
| <b>5</b>  | 0.27  | -0.24 | 0.2   | -4.35 | 5.59  | 0.18  | -2.29 | -1.8  | 0.65  | 0.65  | 0.75  | 0.09  | 1.91  |
| <b>6</b>  | -0.37 | -0.08 | -0.48 | 1.61  | 1.3   | 2.04  | 0.82  | -2.93 | 0.29  | -0.39 | 0.42  | -0.53 | 4.68  |
| <b>7</b>  | 0.58  | -1.72 | 0.66  | 5.35  | -4.3  | -1.62 | 1.02  | 0.77  | -0.46 | 0.16  | -1.04 | 0.42  | -2.75 |
| <b>8</b>  | 1.64  | 1.5   | 0.61  | 5.31  | -2.36 | -0.32 | 0.1   | -1.88 | 0.19  | -1.01 | -0.68 | 0.26  | -1.3  |
| <b>9</b>  | -3.2  | -0.15 | 0.9   | 4.64  | 5.89  | 0.34  | -0.97 | 1.47  | -0.1  | 3.26  | -1.31 | -0.36 | 2.84  |
| <b>10</b> | 10.01 | -2.01 | 0     | -4.92 | 5.17  | 0.67  | 1.51  | -0.1  | 0.19  | -0.89 | -0.67 | -0.09 | 1.79  |
| <b>11</b> | 0.04  | -1.11 | 0.14  | -5.2  | -0.63 | 0.21  | -3.01 | -0.7  | 0.11  | -0.85 | -1.01 | -0.05 | -5.2  |
| <b>12</b> | -0.55 | -0.09 | 0.08  | 5.29  | 2.35  | 0.95  | -0.58 | 0.16  | 0.12  | -1.06 | -0.61 | -0.31 | -3.09 |
| <b>13</b> | 1.32  | 1.86  | 0.04  | 5.31  | 0.06  | 0.18  | -0.88 | 2.35  | 0.17  | 0.14  | -0.56 | -0.07 | -0.04 |
| <b>14</b> | -0.2  | 1.62  | -0.19 | -4.53 | 1.87  | -0.55 | 1.1   | -4.16 | -0.18 | -0.77 | -0.52 | -0.08 | 0.34  |
| <b>15</b> | -0.17 | -3.14 | 0.23  | 5.34  | -0.09 | -1.38 | 0.52  | 2.65  | 0.09  | 0.17  | -0.51 | -0.03 | -0.46 |
| <b>16</b> | -0.18 | 4.18  | 0.41  | -4.69 | 3.43  | 0.8   | -0.82 | 0.71  | -0.12 | -0.06 | -0.62 | -0.5  | 7.86  |
| <b>17</b> | -0.21 | -4.78 | 0.01  | -4.5  | 3.47  | -2.16 | -0.99 | -0.72 | 0.88  | -0.62 | 0.67  | -0.5  | -3.71 |
| <b>18</b> | 1.55  | -4.93 | 0.24  | 4.88  | 10.36 | 7.42  | -0.38 | -1.83 | 4.01  | -0.46 | 0.87  | -0.19 | 0.01  |
| <b>19</b> | -1.02 | 4.34  | 0.33  | -2.02 | -1.12 | 0.3   | -0.46 | 0.08  | 1.1   | -0.5  | -0.92 | -0.53 | -2.46 |
| <b>20</b> | 0.82  | -1.76 | 0.01  | -0.65 | 2.36  | 0.76  | -0.74 | 2.55  | -0.37 | -0.06 | -0.42 | -0.56 | -8.03 |
| <b>21</b> | -0.02 | 2.64  | -0.16 | -2.01 | 2.98  | -1.94 | -0.33 | -1.25 | 0.27  | -0.06 | -0.46 | -0.13 | -0.23 |
| <b>22</b> | -1.24 | -2.73 | -0.39 | 0.06  | 0.94  | -1.54 | -0.32 | -1.75 | 0.04  | -0.06 | 0.02  | -0.51 | 4.76  |
| <b>23</b> | -1.1  | -2.47 | 0.07  | -0.01 | 1.01  | -0.98 | -0.42 | 1.15  | -0.54 | -0.67 | 0.01  | -0.18 | 4.1   |
| <b>24</b> | -1.15 | -3.69 | 1.23  | -0.01 | 2.7   | -0.66 | 0.08  | -1.57 | -0.18 | -0.75 | -0.38 | -0.56 | -2.32 |
| <b>25</b> | 2.43  | -2.61 | 1.21  | -3.7  | 1.08  | 0.71  | -0.12 | -0.1  | -0.15 | -0.11 | -0.27 | -0.2  | 0.69  |
| <b>26</b> | 0     | 2.27  | 0.94  | -1.15 | 1.47  | -2.09 | -0.81 | -1.79 | 0.16  | -0.74 | -0.65 | -0.36 | -5.71 |
| <b>27</b> | -1.19 | -3.35 | -0.24 | 4.76  | -1.18 | 1.69  | -0.14 | -0.18 | 1.59  | -0.74 | 0.05  | 0.02  | 2.82  |

|           |       |        |       |       |       |       |       |       |       |       |       |       |       |
|-----------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>28</b> | 0.63  | -7.32  | 0.2   | 0.33  | -0.6  | -0.56 | 0.07  | -0.01 | 0.29  | -0.5  | -0.07 | 0.04  | -7.42 |
| <b>29</b> | 0.49  | -5.98  | 0.51  | -3.44 | 1.49  | -1.04 | 0.29  | -1.1  | -0.08 | -0.75 | -0.91 | -0.86 | 0.57  |
| <b>30</b> | -0.52 | -2.46  | -0.57 | 0.65  | 1     | 1.01  | -1.36 | 0.49  | 1.31  | -0.74 | -0.46 | -0.19 | 3.93  |
| <b>31</b> | 0.99  | -13.01 | 1.21  | -5.18 | -0.1  | -2.4  | -0.95 | -0.18 | -0.72 | -0.49 | 0.84  | -0.19 | 6.62  |
| <b>32</b> | 0.48  | -1.78  | -0.47 | 4.01  | 0.87  | -0.39 | -0.6  | 0.68  | 0.28  | -0.25 | -0.54 | -0.2  | 10.04 |
| <b>33</b> | -1.06 | -1.77  | -0.19 | 5.29  | -0.34 | 7.4   | -2.64 | 0.69  | 0.13  | -0.6  | 0.53  | -0.26 | 2.14  |
| <b>34</b> | -2.02 | 0.54   | -0.3  | 1.32  | 1.07  | 0.59  | -3.08 | -1.13 | 0.48  | -0.05 | -0.17 | -0.01 | -4.43 |
| <b>35</b> | -3.62 | -0.32  | -0.32 | 0.2   | 0.72  | 0.66  | -0.38 | 0.6   | -0.95 | -0.06 | -0.05 | -0.19 | -2.26 |
| <b>36</b> | 0.96  | -1.42  | -0.59 | -3.91 | 1.78  | 0.41  | 0.41  | 0.88  | -0.63 | -0.06 | -0.8  | -0.2  | -4.25 |
| <b>37</b> | 0.38  | 0.44   | -0.02 | -0.01 | 3.97  | -0.5  | 0.85  | -0.71 | 0.54  | -0.06 | 0.79  | -0.16 | 0.64  |
| <b>38</b> | 1.86  | 0.02   | 0.37  | -3.03 | 1.68  | -1.4  | 1.95  | -0.1  | -0.51 | -0.06 | 0.36  | -0.25 | -3.16 |
| <b>39</b> | 0.91  | -1.82  | 0.49  | -4.62 | -0.18 | 2.44  | -0.79 | 0.17  | 1.26  | -0.75 | 0.44  | -0.34 | -2.69 |
| <b>40</b> | 0.25  | -0.36  | -0.11 | 4.16  | 1.59  | -0.78 | 0.05  | 3.17  | -0.5  | -0.06 | 1.78  | -0.2  | 4.34  |
| <b>41</b> | 1.19  | 1.34   | -0.01 | -0.37 | -0.58 | -1.47 | -0.04 | 2.23  | 1.02  | 0.29  | 1.11  | -0.22 | 1.43  |
| <b>42</b> | 0.69  | -0.44  | 0.14  | -2.72 | -1.27 | 1.39  | -0.19 | 1.2   | 1.27  | 0.3   | 0.2   | -0.3  | 1.35  |
| <b>43</b> | 0.23  | -0.3   | 0.47  | 1.26  | 0.85  | -0.63 | -0.33 | -0.18 | 1.05  | -0.53 | -0.15 | -0.17 | 2.14  |
| <b>44</b> | 0.25  | -0.6   | -0.63 | -1.24 | -0.32 | -0.38 | -0.37 | -3.28 | 0.46  | 0.3   | 3.48  | -0.05 | -2.38 |
| <b>45</b> | 1.71  | -1.07  | -0.64 | -0.99 | -0.29 | 0.63  | -0.37 | -0.93 | 0.73  | -0.72 | -0.14 | -0.24 | -7.83 |

| <b>Cos.</b> | <b>53</b> | <b>54</b> | <b>55</b> | <b>56</b> | <b>57</b> | <b>58</b> | <b>59</b> | <b>60</b> | <b>61</b> | <b>62</b> | <b>63</b> | <b>64</b> | <b>ARRs</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| <b>WP</b>   | <b>AR</b> |             |
| <b>-45</b>  | -1.48     | 1.07      | -1.64     | -0.08     | 0.28      | -0.39     | -0.07     | -0.5      | 0.11      | 0.11      | -1.41     | -0.07     | -0.084      |
| <b>-44</b>  | -1.54     | -1.12     | 1.59      | 0.4       | -0.15     | -0.77     | -0.13     | -0.12     | -0.16     | -0.29     | 0.39      | 0.87      | -0.2255     |
| <b>-43</b>  | 0.94      | 1.37      | -6.15     | -1.96     | -1.9      | -0.11     | -0.13     | -1.28     | -0.1      | -0.03     | 6.03      | -1.05     | 0.1003      |
| <b>-42</b>  | -0.74     | 1.38      | 6.11      | 1.12      | 1.07      | 0.96      | -0.13     | -0.68     | 0.07      | -0.03     | -0.01     | -0.42     | 0.0634      |
| <b>-41</b>  | -1.98     | 1.74      | -5.1      | 0.6       | 0.36      | -0.56     | -0.13     | -0.21     | -0.37     | 0         | -6.89     | -0.44     | -0.4065     |
| <b>-40</b>  | 1.22      | 0.35      | 5.79      | -1.46     | 0.36      | -0.44     | -0.13     | 0         | -0.22     | 0.3       | -0.97     | -0.11     | -0.117      |
| <b>-39</b>  | -1.33     | 0.54      | -1.68     | 0.39      | -0.75     | -1.91     | 0.43      | 0.19      | -0.01     | -0.68     | -0.52     | 2.23      | -0.3718     |
| <b>-38</b>  | -0.04     | -1.49     | -6.53     | 0.19      | -1.4      | -0.37     | -0.1      | 0         | 0.03      | -0.03     | 1.83      | 1.67      | -0.0972     |
| <b>-37</b>  | 0.13      | -0.43     | 7.92      | -0.54     | -0.9      | -0.37     | -0.22     | 1.43      | 0.18      | -0.14     | -3.63     | -0.03     | -0.0745     |
| <b>-36</b>  | -1.64     | 0.34      | -1.69     | 0.46      | -1.51     | 0.1       | -0.1      | 2.46      | -0.15     | 0.37      | -0.95     | -0.18     | -0.2938     |
| <b>-35</b>  | 0.54      | -0.11     | -6.92     | -1.07     | -1.15     | 0.02      | -0.07     | 0.37      | 0.3       | -0.21     | 2.26      | -2.25     | -0.0871     |
| <b>-34</b>  | -1.63     | -0.05     | 3.95      | -0.21     | -0.75     | 0.4       | -0.13     | -0.79     | -0.14     | -0.78     | -2.74     | 1.08      | 0.0679      |
| <b>-33</b>  | -1.09     | 0.47      | 15.81     | 0.19      | -1.54     | 0.76      | 1.06      | -0.48     | 0.47      | -0.48     | -0.95     | 0.88      | 0.2529      |
| <b>-32</b>  | 1.69      | 1.37      | -10.91    | 0.6       | -1.76     | -0.28     | -0.13     | 0.02      | 0.37      | 0.5       | 0.38      | 0.07      | -0.3854     |
| <b>-31</b>  | 1.12      | 1.23      | 0.82      | -1.13     | -0.52     | -0.83     | 0.47      | -1.92     | -0.03     | -0.03     | -0.06     | -0.03     | 0.0696      |
| <b>-30</b>  | 2.41      | -0.39     | -5.63     | -0.53     | -1.23     | 0.76      | -1.86     | -1.09     | -0.02     | 0.47      | -0.97     | -0.45     | -0.2641     |
| <b>-29</b>  | -0.24     | 1.35      | -4.25     | 0.52      | -0.93     | -0.15     | 1.03      | -0.31     | 0.01      | -0.03     | -0.06     | 0.14      | -0.232      |
| <b>-28</b>  | 0.91      | 1.47      | -0.45     | -0.01     | -1.59     | 0.38      | -1.27     | -0.69     | 0.01      | 0.29      | -0.06     | 0.53      | 0.0354      |
| <b>-27</b>  | -1.33     | 1.34      | 6.11      | -0.67     | -0.83     | 0.41      | 2.6       | -1.52     | -0.07     | -0.57     | -0.52     | 0.32      | 0.0586      |
| <b>-26</b>  | 0.99      | 0.99      | -6.53     | -0.73     | 0.36      | -0.43     | 0.14      | 2.63      | -0.01     | 0.81      | 0.41      | 0.05      | 0.0547      |
| <b>-25</b>  | -0.93     | 0.69      | 9.32      | -0.14     | -1.4      | -1.07     | -0.1      | -0.41     | -0.02     | -0.25     | -4        | -0.61     | -0.0701     |
| <b>-24</b>  | 0.92      | 0.39      | -4.49     | -0.14     | -0.25     | -0.41     | -2.5      | 0.65      | -0.11     | -0.57     | -0.52     | 0.14      | -0.032      |
| <b>-23</b>  | 0.47      | 0.92      | -5.39     | 0.18      | -1.36     | 0.14      | 2.18      | 0.22      | 0.06      | -0.1      | -0.52     | 1         | -0.1481     |

|            |       |       |       |       |       |       |       |       |       |       |       |       |         |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| <b>-22</b> | 0.83  | 1.37  | -1.95 | 0.12  | -0.58 | 0.59  | 0.33  | -0.61 | 0.05  | -0.31 | -0.52 | -0.56 | -0.0609 |
| <b>-21</b> | 0.04  | 1.07  | -3.33 | -0.73 | -1.05 | -0.15 | -0.44 | 0.19  | 0.02  | 0     | -0.52 | 0.43  | 0.0407  |
| <b>-20</b> | 2.97  | 1.06  | 3.72  | -0.14 | -0.8  | 0.05  | -0.65 | -1.49 | -0.16 | -0.17 | -0.52 | -0.34 | -0.0613 |
| <b>-19</b> | 0.91  | 0.94  | -4.76 | -1.04 | -0.76 | -0.19 | -3.67 | 1.43  | -0.12 | 0.04  | -0.52 | -0.75 | -0.3441 |
| <b>-18</b> | -0.36 | -0.58 | 0.64  | 0.05  | -1.31 | -0.19 | 3.12  | -2.81 | 0.16  | -0.07 | -0.52 | -0.47 | -0.0963 |
| <b>-17</b> | -0.22 | 0.51  | 2.96  | 0.31  | -1.01 | 0.92  | 0.54  | -1.62 | 0.16  | 0     | -0.52 | -1.02 | 0.3305  |
| <b>-16</b> | -0.51 | 0.71  | 13.21 | -1.95 | -1.47 | -0.55 | -0.04 | 0.26  | 0.22  | -0.66 | -0.08 | 0.18  | -0.104  |
| <b>-15</b> | 0.19  | -0.11 | -4.63 | -0.33 | 0.36  | 0.36  | 0.11  | -0.5  | -0.33 | -0.17 | 0.38  | 0.28  | -0.1826 |
| <b>-14</b> | -1.01 | 1.03  | -1.28 | 0.11  | -0.74 | -0.31 | -0.23 | -0.12 | -0.33 | 0.71  | -1.82 | -0.54 | -0.0704 |
| <b>-13</b> | -0.73 | 0.89  | 1.24  | -0.45 | -0.11 | 0.13  | -0.04 | -0.02 | -0.27 | -0.14 | 1.28  | -0.01 | -0.1795 |
| <b>-12</b> | -2.64 | 1.14  | -3.69 | -0.27 | 0.36  | 0.05  | 0.18  | -0.5  | -0.04 | 0.14  | -0.06 | 0.35  | -0.1445 |
| <b>-11</b> | 0.41  | 0.88  | 0.37  | -0.32 | -0.75 | 0.36  | -0.16 | -0.06 | 0.17  | 0.47  | 0.4   | 0.44  | 0.3357  |
| <b>-10</b> | 1.85  | 0.82  | 4.32  | -0.08 | -0.55 | 0.58  | 1.53  | 0.2   | -0.06 | 0.18  | -1.86 | -0.22 | 0.2188  |
| <b>-9</b>  | 2.72  | 0.82  | -4.57 | -0.51 | -1.52 | -0.03 | -0.29 | -0.47 | -0.15 | 0     | -0.06 | -0.47 | -0.1179 |
| <b>-8</b>  | -2.61 | 0.95  | -6.92 | -0.08 | -0.99 | -0.19 | 0     | -0.05 | -0.02 | -0.46 | -0.97 | 0.01  | -0.19   |
| <b>-7</b>  | 3.44  | 0.49  | -6.12 | -1.28 | -0.16 | -0.15 | -0.38 | -0.56 | -0.1  | -0.46 | 0.39  | 0.22  | -0.0596 |
| <b>-6</b>  | 0.58  | 0.94  | -6.68 | 0.34  | -1.43 | 0.3   | -0.45 | -0.15 | -0.16 | 0.25  | -0.52 | -0.16 | -0.2173 |
| <b>-5</b>  | -1.94 | -0.26 | -5.68 | -0.56 | -1.75 | -0.49 | -0.38 | -0.47 | -0.28 | -0.31 | 1.36  | -0.55 | -0.0989 |
| <b>-4</b>  | 1     | 0.95  | -2.84 | 1.98  | -1.24 | 0.11  | 0.44  | -0.21 | 0.39  | 0.43  | 1.92  | 0.03  | -0.0607 |
| <b>-3</b>  | -1.59 | 1.07  | 4.29  | -0.88 | -0.93 | -0.26 | -0.29 | -0.21 | 0.1   | -0.6  | -4.19 | -0.71 | 0.0485  |
| <b>-2</b>  | -1.45 | 0.97  | -6.32 | 0.87  | -0.53 | 0.34  | 1.36  | 0.16  | -0.36 | -0.69 | 2.88  | 0.74  | -0.0581 |
| <b>-1</b>  | 2.04  | 1.2   | -1.32 | -0.08 | -1    | -0.15 | -0.68 | -0.09 | -0.08 | -0.07 | -6.22 | 0.01  | -0.0211 |
| <b>0</b>   | -1.25 | 0.19  | -4.85 | -1.07 | -1.65 | -2.01 | 1.59  | 0.78  | -0.08 | 0.21  | 0.83  | -0.18 | -0.1855 |
| <b>1</b>   | 1.53  | -4.08 | 4.5   | -1.35 | -1.85 | 1.26  | -0.92 | -0.15 | 0.27  | -0.24 | 4.85  | -0.38 | 0.0936  |
| <b>2</b>   | 0.61  | 0.18  | 6.15  | 2.39  | -1.84 | 0.6   | -0.17 | 0.08  | -0.41 | -0.27 | 0.98  | -0.93 | 0.2202  |

|           |       |       |        |       |       |       |       |       |       |       |       |       |         |
|-----------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| <b>3</b>  | -2.48 | 0.23  | -1.08  | 1.02  | -0.77 | -0.84 | 0.33  | 0.14  | 0.1   | -0.4  | -0.52 | -0.76 | -0.2404 |
| <b>4</b>  | 0.57  | 0.54  | -4.04  | 0.85  | 0.36  | 0.52  | 1.98  | -1.14 | -0.08 | 0.31  | -0.52 | -1.82 | -0.0699 |
| <b>5</b>  | 3.35  | -1.16 | 2.01   | 0.33  | 0.36  | 0.07  | -3.1  | -0.05 | -0.65 | -0.14 | -1.5  | -1.26 | -0.1669 |
| <b>6</b>  | 0.16  | 0.8   | 4.44   | -1.19 | 0.36  | 0.44  | -1.3  | 0.11  | 0.61  | 0.42  | -1    | 2.57  | 0.1367  |
| <b>7</b>  | -0.08 | -0.7  | 5.85   | 3.66  | 0.36  | 0.36  | 3.29  | -0.15 | 0.33  | -0.27 | -0.52 | 1.33  | 0.1061  |
| <b>8</b>  | -2.1  | 0.41  | -0.45  | -3.18 | 0.36  | -0.55 | -4.42 | 0.37  | 0.23  | -0.61 | -2.86 | -0.5  | -0.0472 |
| <b>9</b>  | 1.51  | 0.48  | -0.45  | -3.36 | -0.57 | -1.52 | 8.5   | 0.02  | 0.37  | 2.51  | 1.42  | 1.83  | 0.4961  |
| <b>10</b> | -0.27 | 0.78  | -0.45  | -7.19 | -1.52 | 1.17  | 0.74  | -0.37 | -0.35 | 1.1   | -1    | -1.56 | 0.235   |
| <b>11</b> | -0.62 | -0.13 | 16.37  | 0.39  | -0.39 | -2.42 | 1.73  | -0.02 | -0.71 | -0.51 | -0.03 | 0.74  | -0.0577 |
| <b>12</b> | 0.77  | 0.46  | 19.95  | -2.05 | 0.35  | 0.39  | 0.13  | -0.21 | 0.01  | 1.28  | -4.16 | -1.16 | 0.5246  |
| <b>13</b> | -1.48 | -0.01 | 2.81   | 1.07  | -0.69 | 0.53  | 1.69  | -0.15 | -0.7  | 0.4   | 2.34  | 0.48  | 0.4523  |
| <b>14</b> | 0.31  | 1     | 5.36   | -0.87 | -0.99 | 0.04  | -3.21 | -0.21 | -0.05 | -3.14 | 4.65  | 0.01  | -0.2214 |
| <b>15</b> | -0.53 | 0.15  | -1.03  | -1.41 | -1.24 | -0.15 | 1.49  | -0.48 | -0.03 | -1.38 | -1.53 | 0.89  | 0.0351  |
| <b>16</b> | 2.29  | -0.9  | 1.32   | 0.79  | -1.18 | 0.41  | 0.13  | 0.05  | 0.11  | -0.2  | 0.52  | -0.22 | -0.1549 |
| <b>17</b> | -0.54 | -0.13 | -8.92  | -1.88 | -0.97 | -0.04 | -0.51 | -0.25 | -0.08 | -0.3  | -3.47 | -0.83 | -0.3038 |
| <b>18</b> | 1.78  | 0.14  | 4.01   | -1.4  | -1.13 | 0.26  | -0.13 | -0.15 | -0.02 | -0.06 | 1.52  | -3.03 | 0.5353  |
| <b>19</b> | -0.53 | 1.04  | 5.53   | -1.92 | -0.48 | -1.21 | -0.35 | -0.08 | -0.17 | -0.13 | -0.52 | -1.17 | -0.1192 |
| <b>20</b> | 0.09  | 1.95  | -1.04  | -0.83 | 0.36  | -0.49 | -1.34 | -0.44 | -0.24 | 0.78  | -0.52 | 0.21  | -0.166  |
| <b>21</b> | 4.26  | 1.21  | -2.76  | -0.05 | -0.19 | -0.15 | 2     | -0.02 | -0.02 | -0.1  | -1.02 | 0.9   | -0.217  |
| <b>22</b> | -1.23 | 1.37  | 1.32   | -1.88 | 0.36  | -0.15 | 0.44  | -0.18 | -0.15 | 0.14  | 0.51  | -1.4  | 0.0883  |
| <b>23</b> | -0.04 | 0.67  | -0.45  | -1.57 | -1.15 | 0     | -0.78 | -0.25 | -0.12 | -0.14 | -1.02 | -0.45 | -0.1726 |
| <b>24</b> | -1.69 | 1.22  | 0.75   | 1.84  | -1.56 | 0.27  | -0.69 | -0.12 | -0.09 | 0.03  | -1.52 | -0.53 | -0.0995 |
| <b>25</b> | 2.05  | 0.73  | -1.04  | 2.67  | -0.59 | 0.77  | 2.21  | -0.25 | -0.15 | 0.03  | 0.5   | -0.73 | 0.0416  |
| <b>26</b> | -3.58 | 0     | 10.26  | 2.04  | -0.62 | 0     | -0.91 | -0.18 | 0.28  | -0.03 | -0.52 | 1.7   | -0.0942 |
| <b>27</b> | 1.49  | 0.77  | -15.76 | 2.31  | 0.02  | 0.03  | 0.65  | -0.15 | 0.15  | -0.93 | 0     | -0.23 | 0.2311  |

|           |       |       |       |       |       |       |       |       |       |       |        |       |         |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|---------|
| <b>28</b> | -1.07 | 1.57  | 2.38  | -0.71 | -0.76 | 0.6   | -2.35 | -0.25 | 0.21  | -0.59 | 0.53   | 2.37  | -0.0885 |
| <b>29</b> | -1.65 | 0.55  | -6.72 | 2.64  | -0.09 | -0.95 | 2.13  | -0.25 | -0.16 | 0.57  | -2.04  | 0.99  | -0.2439 |
| <b>30</b> | -0.69 | 1.21  | 5.13  | 3.6   | -1.84 | -0.67 | 3.65  | -0.12 | -0.09 | -0.53 | -0.52  | 0.52  | 0.0821  |
| <b>31</b> | -0.85 | 1.19  | 2.44  | -1.12 | -1.09 | -0.04 | -3.65 | -0.28 | -0.05 | 0.88  | 2.69   | 0.46  | -0.2476 |
| <b>32</b> | 3.03  | 0.8   | -5.84 | -2.39 | 0.24  | -0.34 | -0.13 | -0.25 | -0.29 | 0.07  | -0.52  | -2.86 | -0.0044 |
| <b>33</b> | -3.61 | 0.73  | -3.07 | 0.47  | -1.47 | 0.4   | -0.13 | -0.15 | 0.17  | -0.27 | 4.09   | 2.55  | -0.0616 |
| <b>34</b> | 4.01  | 0.75  | -0.45 | -1.7  | -1.73 | -0.52 | 3.43  | -0.21 | -0.22 | 3.38  | -4.8   | -0.41 | 0.2758  |
| <b>35</b> | -1.84 | 0.04  | -0.45 | 3     | -1.3  | -0.26 | -3.75 | 0.02  | 0.13  | 0.04  | -1.05  | -2.83 | -0.2208 |
| <b>36</b> | -0.3  | 0.42  | -3.95 | 5.96  | -1.85 | 0     | 3.37  | -0.18 | -0.15 | -0.07 | 8.63   | 0.33  | -0.6784 |
| <b>37</b> | -0.25 | 0.63  | 3.22  | -0.77 | -1.84 | 0.26  | -0.67 | -0.08 | -0.16 | -1.18 | -0.52  | -0.94 | 0.1454  |
| <b>38</b> | 2.7   | 0.5   | -2.98 | 0.96  | -1.83 | 0.47  | 2.16  | -0.58 | 0.07  | 0     | -0.52  | -1.86 | -0.2727 |
| <b>39</b> | 0.66  | 0.73  | 4.38  | 2.74  | -1.84 | -0.44 | -1.54 | -0.21 | -0.35 | -0.28 | -0.52  | 1.86  | 0.0784  |
| <b>40</b> | 0.65  | 0.56  | -2.54 | -0.69 | -1.84 | 0.36  | 3.99  | 0.97  | 0.04  | 0.22  | 2.69   | 0.92  | 0.1599  |
| <b>41</b> | -1.75 | 0.59  | -7.18 | -0.21 | -1.82 | 0.6   | -4.86 | -0.25 | -0.02 | -1.57 | -3.56  | 0.54  | -0.0342 |
| <b>42</b> | 0.58  | 0.65  | 6.87  | 1.68  | -1.06 | -0.11 | 1.37  | -0.65 | -0.09 | -0.1  | 2.69   | 0.47  | 0.0208  |
| <b>43</b> | -0.64 | -0.05 | -5.37 | 3.23  | -1.84 | -0.14 | -0.96 | -0.15 | -0.07 | 1.17  | 14.73  | -0.91 | 0.0417  |
| <b>44</b> | 1.73  | 0.43  | -9.26 | 0.93  | -0.96 | -0.11 | -1.66 | 1.87  | -0.01 | -2.27 | -15.15 | 0.4   | -0.6882 |
| <b>45</b> | -0.57 | 0.87  | -4.63 | -0.52 | -1.59 | 10.99 | 32.3  | -0.46 | 0.14  | 0.67  | -0.52  | -0.77 | 0.7959  |

**Appendix – B**  
**Abnormal Returns from 86 Stock Splits Companies**  
**91 days Window Period**

| <b>Cos.</b> | <b>1</b>  | <b>2</b>  | <b>3</b>  | <b>4</b>  | <b>5</b>  | <b>6</b>  | <b>7</b>  | <b>8</b>  | <b>9</b>  | <b>10</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | -0.2723   | -0.3263   | -5.0634   | -1.1487   | -0.9564   | -0.6528   | 1.3001    | -1.2671   | -0.3822   | -0.1119   |
| <b>-44</b>  | -1.6003   | -1.2316   | -0.9073   | 0.3171    | -0.0572   | -0.0368   | -0.6294   | 0.7235    | -0.7492   | -0.0807   |
| <b>-43</b>  | -0.098    | 1.0343    | -5.2833   | -1.3638   | -0.3248   | 0.3816    | 6.4114    | -3.8027   | 0.11      | -0.1161   |
| <b>-42</b>  | -2.422    | 0.2127    | -0.3734   | 2.6608    | -0.3462   | 0.2925    | -1.5634   | 4.6065    | 0.4253    | -0.0473   |
| <b>-41</b>  | 0.4083    | -2.3986   | -2.6137   | -0.644    | -0.357    | -0.3855   | 7.8175    | -3.8333   | 0.4268    | -0.051    |
| <b>-40</b>  | -2.0983   | 0.6837    | -3.0953   | 1.4846    | 2.0729    | -1.5709   | -5.207    | -4.1334   | -0.229    | -0.1294   |
| <b>-39</b>  | 0.0763    | 0.1185    | 1.1864    | 1.8971    | -0.3855   | -0.5792   | -5.9768   | -0.4096   | 0.1129    | -0.1395   |
| <b>-38</b>  | 0.6158    | 5.7232    | -2.0694   | 0.4751    | -0.2321   | -0.339    | -3.5648   | 0.2274    | 0.1232    | -0.1109   |
| <b>-37</b>  | 1.9271    | -0.8915   | -2.3101   | -1.7895   | -0.9278   | -0.1162   | 3.3528    | -1.3161   | 0.7437    | -0.0842   |
| <b>-36</b>  | -1.2766   | -0.7764   | 4.327     | 2.8495    | -0.2499   | -1.3869   | -1.4608   | -1.1446   | 0.5639    | -0.0902   |
| <b>-35</b>  | 0.898     | 1.5995    | -6.0161   | 0.1416    | -0.0144   | -1.476    | 0.4636    | 0.4233    | 0.443     | -0.1123   |
| <b>-34</b>  | -0.5545   | 0.0138    | -5.545    | -0.091    | 0.849     | -1.137    | 3.2861    | -1.1446   | -0.4338   | -0.121    |
| <b>-33</b>  | -0.3636   | -4.4395   | 3.2802    | 1.2915    | -0.4069   | -1.2823   | 0.9973    | -2.3573   | 0.3251    | -0.048    |
| <b>-32</b>  | -3.4346   | -1.6346   | 3.8664    | 0.0714    | 1.2915    | -1.0382   | -5.6278   | -1.2426   | -0.6328   | -0.1078   |
| <b>-31</b>  | 0.1759    | 0.4953    | 0.5688    | -0.4597   | -0.2785   | -0.3254   | 0.6227    | 1.2073    | -0.4205   | -0.1504   |
| <b>-30</b>  | 0.1925    | -0.567    | 9.4463    | 0.0231    | -0.4818   | -0.6973   | -3.534    | 2.0648    | -0.5635   | -0.0966   |
| <b>-29</b>  | 1.1802    | -0.2687   | 9.4986    | 0.3259    | -0.332    | -0.6954   | 0.2173    | -2.1735   | -0.4368   | -0.0706   |
| <b>-28</b>  | -1.1023   | -0.2373   | 9.4567    | -1.3989   | 0.2746    | -0.3487   | -0.6705   | 4.2084    | -0.2658   | -0.0644   |
| <b>-27</b>  | -1.1023   | -0.185    | 9.4986    | -0.3148   | -0.5461   | -0.5346   | -0.0957   | -2.5349   | -0.2304   | -0.0888   |

|            |         |         |         |         |         |         |         |         |         |         |
|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>-26</b> | -1.8576 | 3.206   | 9.4567  | 0.3215  | -0.728  | -1.3888 | 0.7921  | -0.281  | -0.1509 | -0.0623 |
| <b>-25</b> | -0.9114 | -2.7963 | 9.5405  | -1.1619 | 2.0408  | -0.9336 | 1.0179  | 0.2825  | -0.1302 | -0.1593 |
| <b>-24</b> | 0.6324  | -1.4305 | 9.5405  | -0.9468 | -0.9635 | 0.2944  | 1.7671  | -2.2409 | 0.1424  | -0.1348 |
| <b>-23</b> | -2.0568 | -0.0437 | 9.4149  | -1.5086 | -2.8082 | -1.5457 | 1.2385  | -3.1106 | 0.3133  | -0.0874 |
| <b>-22</b> | 1.454   | 1.0186  | 9.4986  | 0.3259  | 2.0408  | -1.5632 | 3.2245  | -0.6975 | 0.7245  | -0.0753 |
| <b>-21</b> | -1.6916 | -0.0176 | 9.4881  | -1.7017 | 0.5101  | -1.5748 | 1.2129  | 2.3955  | -0.0742 | -0.1053 |
| <b>-20</b> | 2.9978  | -0.4362 | 9.373   | -0.0954 | 0.9739  | 0.3506  | 0.048   | -2.1062 | 0.1733  | -0.1372 |
| <b>-19</b> | -0.4798 | -1.7811 | 9.5614  | 0.6902  | 0.3745  | 0.3777  | -1.9996 | 5.2496  | -0.338  | -0.0779 |
| <b>-18</b> | -4.0903 | -0.97   | -4.9378 | 2.4589  | -0.3962 | 0.3816  | 2.3111  | 2.9957  | 0.5904  | -0.0774 |
| <b>-17</b> | -1.1023 | 1.2436  | 1.1446  | -0.4553 | -0.3462 | -1.1177 | 0.9152  | 6.2357  | 0.1837  | -0.1396 |
| <b>-16</b> | -0.9031 | 2.5414  | 3.3639  | -0.6747 | -0.646  | -0.4688 | -2.482  | 2.2424  | -0.061  | -0.0622 |
| <b>-15</b> | -2.09   | 4.8911  | -3.0011 | -1.1882 | -0.043  | 0.3138  | 10.3578 | 0.5336  | 0.0967  | -0.0818 |
| <b>-14</b> | 3.0393  | 0.7098  | -2.9592 | 0.9799  | 0.5422  | -1.5457 | 1.5618  | 2.7385  | 0.0186  | -0.1227 |
| <b>-13</b> | -1.3098 | 0.8145  | 8.0016  | 0.857   | 0.0855  | -1.5632 | -0.0341 | 0.5397  | 0.2028  | -0.1809 |
| <b>-12</b> | 0.1593  | 1.1233  | -7.1886 | 0.5146  | -0.0537 | -1.5554 | 1.6799  | -1.1813 | -0.198  | -0.1319 |
| <b>-11</b> | -1.3098 | 0.9453  | -0.9073 | -0.745  | -0.3177 | -1.4934 | 0.1095  | 1.2747  | 0.2161  | -0.0567 |
| <b>-10</b> | -2.1315 | 0.6837  | 8.2005  | -0.9512 | -0.0858 | -1.5593 | -0.1111 | -1.3283 | -0.0801 | -0.0424 |
| <b>-9</b>  | -0.6873 | -4.8477 | 6.3999  | -1.6403 | 0.9311  | -1.5632 | 0.7869  | 3.0753  | -0.2437 | -0.0889 |
| <b>-8</b>  | -1.7165 | 1.3378  | -9.8162 | -3.3124 | -0.4569 | -1.4721 | 0.3353  | -0.1156 | 0.082   | -0.0987 |
| <b>-7</b>  | 1.0059  | -2.3463 | -3.0848 | -0.1832 | -0.4747 | -1.2959 | -0.7834 | -0.0973 | -0.0934 | -0.0636 |
| <b>-6</b>  | -0.0316 | -1.0589 | -3.0429 | -1.4516 | -2.0197 | -1.567  | -0.768  | -0.2442 | 0.6037  | -0.0977 |
| <b>-5</b>  | -1.7414 | 1.1808  | 1.2702  | 0.2381  | -0.9207 | -1.0809 | 3.2913  | -1.7509 | -0.1582 | -0.0506 |
| <b>-4</b>  | -0.679  | -1.2316 | 1.3225  | -0.1042 | 1.8088  | 0.3661  | -0.6551 | -0.4892 | 0.4342  | -0.0942 |
| <b>-3</b>  | 1.7694  | -0.6822 | -0.9073 | -2.5224 | -1.3631 | 0.2111  | 1.2847  | -2.4369 | 0.639   | -0.0807 |
| <b>-2</b>  | 1.3959  | 0.8459  | 1.3644  | 0.3874  | 0.1854  | 0.3719  | -1.4813 | 4.435   | -0.313  | -0.1165 |

|           |         |          |          |         |          |          |          |         |          |         |
|-----------|---------|----------|----------|---------|----------|----------|----------|---------|----------|---------|
| <b>-1</b> | 2.9563  | 0.9035   | 3.856    | 4.1486  | 0.139    | -17.9755 | -1.9278  | 5.0781  | 0.2146   | -0.122  |
| <b>0</b>  | -75.594 | -42.8611 | -94.8119 | -34.451 | -28.7549 | 0.3312   | -40.0058 | -54.399 | -11.7649 | 0.5883  |
| <b>1</b>  | -0.5877 | 3.7032   | -1.8809  | -0.3456 | -1.8484  | -1.5729  | -1.743   | -0.0973 | -0.1391  | -0.0814 |
| <b>2</b>  | 0.6573  | -2.4876  | -5.7753  | -3.3124 | 1.1059   | -1.4373  | -0.8809  | -0.5076 | 0.3296   | -0.0716 |
| <b>3</b>  | -0.9031 | 1.4948   | 3.6885   | -0.802  | -0.3355  | -0.2538  | 1.3412   | -0.8567 | -0.0168  | -0.0781 |
| <b>4</b>  | 0.6988  | 1.4582   | -5.7543  | 1.7742  | -1.6807  | 0.3642   | 3.7121   | -0.6485 | 0.7171   | -0.1351 |
| <b>5</b>  | 2.0184  | 0.0819   | -3.1686  | -2.4127 | -0.0037  | -0.4048  | 1.4797   | 3.3142  | -0.0197  | -0.1703 |
| <b>6</b>  | -1.5837 | -0.3786  | 4.3061   | -2.4127 | 0.7884   | -1.2319  | 2.9987   | -0.232  | 0.054    | -0.1046 |
| <b>7</b>  | -3.8745 | -0.0856  | -3.2209  | -2.2766 | 0.5136   | 0.3661   | 1.5208   | -0.428  | -0.1862  | -0.1092 |
| <b>8</b>  | 3.0476  | 2.4525   | -5.9742  | -1.4779 | -0.2785  | 0.1298   | 0.1301   | -3.3434 | 0.051    | -0.1092 |
| <b>9</b>  | -2.09   | -0.2164  | -5.9428  | -0.6133 | 0.0034   | 0.3293   | -0.2753  | 8.2017  | -0.033   | -0.0762 |
| <b>10</b> | -2.5631 | -2.2259  | -6.0893  | -2.4127 | 0.0284   | -1.1874  | 1.0179   | 4.141   | -0.1361  | -0.0647 |
| <b>11</b> | -2.7706 | 1.5262   | -6.0265  | -0.5694 | 0.2032   | 0.8213   | 0.3867   | 0.013   | -0.1789  | -0.1021 |
| <b>12</b> | 2.7322  | 0.4534   | -6.1312  | -0.3412 | -0.0894  | 1.3346   | 0.2378   | 1.4094  | -0.0683  | -0.0623 |
| <b>13</b> | 2.1844  | 1.9292   | 2.83     | 0.1065  | -0.4854  | -0.5889  | -3.0619  | 2.1934  | 0.3738   | -0.1491 |
| <b>14</b> | 1.7528  | 4.1218   | 4.1805   | -0.2183 | -0.7566  | -0.5327  | 1.1308   | 5.7457  | 0.0201   | -0.0347 |
| <b>15</b> | 2.6658  | 0.5058   | 4.2224   | -1.6403 | -0.2107  | 0.2441   | -0.419   | 0.6928  | -0.142   | -0.1243 |
| <b>16</b> | 3.0393  | -0.0437  | 4.2642   | 1.5987  | 0.478    | -0.984   | -0.1727  | -2.737  | -0.2113  | -0.0605 |
| <b>17</b> | -3.2852 | -0.2164  | 4.2956   | -2.1889 | -0.0323  | 0.0717   | 0.3918   | 1.587   | -0.033   | -0.1351 |
| <b>18</b> | -3.0611 | -1.3049  | 4.3166   | -2.4127 | 0.3638   | -0.5482  | -0.9117  | 0.8092  | 0.39     | -0.0877 |
| <b>19</b> | 0.0597  | 0.1551   | 4.327    | -0.7318 | -0.0965  | 0.0019   | 2.1828   | 0.2457  | 0.4769   | -0.0916 |
| <b>20</b> | -5.0531 | 2.3269   | -5.6706  | -0.7713 | 0.585    | -0.5307  | 0.1301   | 1.489   | -0.1258  | -0.1252 |
| <b>21</b> | -0.0399 | 2.4315   | 4.0758   | -0.1217 | -0.0965  | -0.8039  | 0.7869   | 0.2396  | -0.1553  | -0.0886 |
| <b>22</b> | -1.0442 | -0.9334  | 3.7827   | 0.5805  | -0.2214  | 0.3428   | 0.3097   | 0.65    | 0.0923   | -0.1176 |
| <b>23</b> | -0.2059 | 1.3221   | -6.0998  | -1.6578 | -0.2071  | -1.7123  | 1.0435   | 2.5057  | 0.3797   | -0.0889 |

|           |         |         |         |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>24</b> | -1.9572 | -0.745  | -6.0789 | -1.0697 | -0.4247 | -0.5598 | 0.3559  | 0.3254  | -0.0197 | -0.0679 |
| <b>25</b> | 2.0765  | -0.0647 | -2.53   | 0.0582  | -0.3427 | -0.6198 | -1.2606 | -0.33   | 0.082   | -0.1005 |
| <b>26</b> | 3.0393  | 1.1599  | -5.9742 | -0.6221 | -0.1964 | 0.1763  | -0.7013 | -0.5934 | 0.0127  | -0.0998 |
| <b>27</b> | 1.6864  | -0.4362 | -2.8545 | 1.9059  | -0.1893 | -0.5462 | -2.1433 | -0.2259 | 0.4799  | -0.0851 |
| <b>28</b> | 3.0393  | -0.1379 | -2.4044 | 1.9761  | -0.2142 | -0.6663 | 3.4452  | -0.2687 | 0.4003  | -0.0795 |
| <b>29</b> | 3.031   | 0.0034  | 4.2328  | -2.3293 | -0.4569 | -0.4048 | 0.166   | -0.0789 | -0.5812 | -0.0818 |
| <b>30</b> | -2.2228 | 0.0138  | -3.7339 | -2.1889 | -0.5461 | -2.3109 | -0.3985 | 1.2686  | -0.03   | -0.0535 |
| <b>31</b> | -3.4844 | -2.8016 | 0.1919  | 1.9761  | -0.2463 | 0.093   | 0.5663  | -0.8751 | 0.2013  | -0.1297 |
| <b>32</b> | 2.782   | -0.206  | -5.9323 | 4.2802  | -0.621  | -0.8213 | -0.5217 | 0.2702  | 0.474   | -0.1347 |
| <b>33</b> | 0.0846  | -1.3154 | -3.9537 | -0.6484 | -1.5094 | -1.0208 | -0.0906 | -0.1279 | -0.2128 | -0.0941 |
| <b>34</b> | 3.0393  | 1.3117  | 4.2119  | 1.7084  | 1.8302  | -1.0073 | -0.9476 | -0.5995 | -0.1494 | -0.0746 |
| <b>35</b> | -1.6418 | -2.0742 | -2.174  | 2.5774  | -0.4997 | 0.1608  | -1.6147 | 1.1706  | 0.5757  | -0.1143 |
| <b>36</b> | -5.1942 | -0.8496 | -5.1472 | 1.2827  | -0.043  | -0.614  | 0.7459  | -1.1262 | 0.0967  | -0.128  |
| <b>37</b> | -3.4014 | 1.118   | 3.9606  | 2.7134  | -0.3677 | -0.86   | -1.8508 | 1.1644  | 0.2839  | -0.0931 |
| <b>38</b> | -5.2274 | -1.1217 | -6.1312 | -0.0427 | -0.282  | 0.0465  | -1.6096 | 3.0141  | 0.0893  | -0.0888 |
| <b>39</b> | -2.5465 | -1.2735 | -6.0684 | 0.8131  | 0.164   | 0.552   | -0.6346 | -1.7081 | -0.5119 | -0.069  |
| <b>40</b> | 3.0476  | -2.7597 | -5.9951 | -0.7274 | -0.8886 | -0.9298 | -0.5319 | -0.1218 | -0.1317 | -0.1404 |
| <b>41</b> | 1.4706  | 0.443   | -5.9218 | 0.5015  | 0.2746  | -0.9085 | 3.3118  | 0.5765  | 0.1159  | -0.1458 |
| <b>42</b> | 3.0476  | -0.5252 | -5.6915 | 0.5892  | -0.3641 | -0.339  | 0.1917  | 2.0464  | -0.0094 | -0.0921 |
| <b>43</b> | -4.746  | -0.0699 | 4.2956  | -0.6396 | 0.1033  | -0.4959 | 0.4277  | 0.405   | -0.0286 | -0.0289 |
| <b>44</b> | 3.0227  | 0.9035  | 4.1805  | -0.7976 | -0.5246 | -0.5947 | 0.6176  | 0.2151  | 0.0319  | -0.0163 |
| <b>45</b> | 3.031   | 2.4158  | 2.0867  | -0.8064 | -0.5282 | -0.4765 | 0.3661  | 0.3498  | 0.306   | -0.1082 |

| <b>Cos.</b> | <b>11</b> | <b>12</b> | <b>13</b> | <b>14</b> | <b>15</b> | <b>16</b> | <b>17</b> | <b>18</b> | <b>19</b> | <b>20</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | -0.6648   | -0.044    | -0.6557   | 0.3238    | 0.4453    | -0.618    | -1.2923   | 2.3503    | 2.1069    | -0.5509   |
| <b>-44</b>  | -1.4753   | 0.0841    | 0.6276    | 0.0803    | -3.4134   | -0.9448   | 2.8848    | -5.2712   | 2.1069    | -0.2766   |
| <b>-43</b>  | -1.265    | -0.3653   | -1.6487   | -0.2062   | -1.9302   | -0.2104   | -1.4397   | 5.7476    | 2.1027    | -0.4554   |
| <b>-42</b>  | -1.4399   | 0.4776    | -0.9292   | -0.5308   | -1.26     | -1.2265   | 2.0273    | 5.7476    | 2.0901    | -0.3966   |
| <b>-41</b>  | -1.594    | 0.094     | -0.054    | 0.9255    | -3.4412   | -0.6226   | -0.256    | 4.2334    | 2.0691    | -0.4044   |
| <b>-40</b>  | -0.6904   | -0.1233   | 0.2153    | -2.288    | -3.4689   | -0.7046   | -3.0705   | 2.2231    | -0.0476   | -0.6858   |
| <b>-39</b>  | -0.1094   | -0.1295   | -1.1312   | -2.0158   | -3.0446   | -0.7      | 0.3122    | 2.6302    | 0.2542    | -0.4476   |
| <b>-38</b>  | -0.2796   | -0.1332   | -0.3948   | -1.6243   | -0.328    | -0.9367   | -0.6663   | -5.3475   | 1.5242    | -0.3521   |
| <b>-37</b>  | -0.4673   | -0.1147   | -0.7525   | -0.2826   | -1.0419   | -0.8304   | -2.8338   | 0.5945    | -0.2404   | -0.3617   |
| <b>-36</b>  | -1.647    | -0.0605   | -0.6178   | -0.7218   | -2.2475   | -0.4898   | 0.3227    | 3.1265    | -1.2632   | -0.435    |
| <b>-35</b>  | -1.6117   | -0.1213   | 1.3976    | 0.3143    | -2.6877   | -0.8801   | -1.2029   | -0.0417   | 2.0482    | -0.3502   |
| <b>-34</b>  | -0.4962   | 0.1052    | -1.1648   | 0.171     | -1.7597   | -0.9147   | 0.2859    | -2.6755   | -0.8608   | -0.3419   |
| <b>-33</b>  | -1.594    | -0.0374   | -0.7188   | -0.2444   | -1.4147   | -0.8374   | -0.2875   | -1.3523   | -0.2991   | -0.4538   |
| <b>-32</b>  | -1.5635   | -0.1609   | 0.8296    | -0.5404   | -2.3228   | -0.2335   | -1.3344   | -2.472    | 0.1997    | -0.4838   |
| <b>-31</b>  | -0.1528   | -0.0807   | -0.5968   | -0.464    | -3.2627   | 0.4119    | -0.8189   | 0.111     | -0.5422   | -0.4343   |
| <b>-30</b>  | -0.1175   | -0.0737   | 1.0063    | -0.7935   | -3.4888   | -0.7415   | 1.659     | -3.07     | 2.0733    | -0.349    |
| <b>-29</b>  | -0.0806   | -0.0982   | -1.3416   | -1.1755   | -1.5297   | -0.5037   | -1.7816   | 1.2306    | -2.068    | -0.3156   |
| <b>-28</b>  | -0.2555   | -0.0596   | -0.9418   | 0.7106    | -0.3637   | -0.469    | 1.3539    | -2.5865   | -2.0805   | -0.4081   |
| <b>-27</b>  | -0.2314   | -0.1662   | 0.3247    | -1.419    | 0.358     | -1.1699   | -0.3033   | 3.8772    | -2.0344   | -0.3948   |
| <b>-26</b>  | -0.6567   | -0.0447   | -0.2097   | -0.1011   | 0.3303    | -1.133    | 1.075     | 0.2891    | 2.1027    | -0.3363   |
| <b>-25</b>  | -0.1945   | -0.1309   | -1.3963   | -1.4237   | -2.3268   | -0.6965   | 0.3017    | 1.4597    | 2.0817    | -0.4214   |
| <b>-24</b>  | -1.3132   | -0.0599   | -0.0582   | 0.109     | -0.7167   | -0.5233   | -1.9289   | -5.2076   | 2.0566    | -0.5379   |
| <b>-23</b>  | -0.6503   | -0.1497   | 0.1143    | -1.1659   | -3.1993   | -0.8143   | 2.406     | -1.4922   | 2.0901    | -0.3626   |

|     |         |         |          |          |          |         |         |           |          |         |
|-----|---------|---------|----------|----------|----------|---------|---------|-----------|----------|---------|
| -22 | -0.1752 | -0.1682 | 2.3864   | -0.273   | -3.2349  | -0.0615 | 0.8015  | -0.538    | 2.0524   | -0.353  |
| -21 | -1.5427 | -0.1668 | -1.2448  | 1.317    | -1.3155  | -1.0718 | -1.6817 | 4.0935    | 4.1859   | -0.3781 |
| -20 | -1.5154 | -0.1186 | 0.7118   | 0.3668   | -0.3161  | -1.2784 | -0.882  | -1.0342   | 4.1775   | -0.4198 |
| -19 | -1.4913 | -0.1348 | 1.2588   | -1.4954  | -1.6407  | -0.9378 | 0.7068  | -3.7571   | 2.8236   | -0.4891 |
| -18 | -1.6566 | -0.0675 | -2.2294  | -0.2396  | -1.4186  | -1.23   | -1.2292 | -4.7368   | 4.2027   | -0.3502 |
| -17 | -1.6197 | -0.0866 | 3.7161   | -0.5165  | -1.1965  | -1.3396 | -0.9399 | 0.7217    | -0.9656  | -0.452  |
| -16 | -1.586  | 0.053   | 2.4538   | -0.6502  | -0.5025  | -0.9436 | -0.5348 | -3.897    | 2.4883   | -0.4238 |
| -15 | -1.5571 | -0.0754 | 1.7216   | -0.1393  | -1.5297  | -1.0556 | -0.6979 | -0.6906   | -0.3997  | -0.5599 |
| -14 | -1.5282 | -0.1117 | 0.3499   | 3.4943   | -2.7472  | -1.8927 | -0.256  | 0.8489    | 2.6182   | -0.5364 |
| -13 | -1.6518 | -0.147  | -0.6599  | 0.5053   | -3.4293  | -0.7923 | -1.85   | -2.0648   | -0.9446  | -0.3348 |
| -12 | -1.6165 | -0.0675 | 0.1269   | 0.4384   | -1.843   | -1.0741 | 0.3596  | -0.2326   | -1.1248  | -0.3979 |
| -11 | -1.5828 | -0.0648 | -0.9965  | -2.8323  | -1.4266  | -1.7761 | 1.638   | -2.4974   | -3.229   | -0.131  |
| -10 | -1.5539 | -0.1061 | -1.0975  | -0.7744  | -1.7399  | -0.6688 | -2.5497 | 5.4422    | -0.3662  | -0.3598 |
| -9  | -1.6502 | -0.1061 | 0.2994   | -0.2062  | -1.9421  | 0.1348  | -1.9289 | -6.8235   | 1.6793   | -0.268  |
| -8  | -1.6149 | 0.056   | 0.6192   | -0.698   | -2.4378  | -1.3119 | -1.2187 | -6.798    | 3.0667   | -0.2349 |
| -7  | -1.5812 | -0.2174 | -0.8956  | -0.8317  | -0.0663  | -0.5048 | -1.5607 | -6.8871   | -3.8158  | -0.3385 |
| -6  | -1.6598 | -0.1299 | 1.5954   | -1.1898  | -3.3262  | -0.327  | 0.1123  | 5.7094    | 1.7045   | -0.4047 |
| -5  | -1.6229 | 0.1537  | -0.2854  | -0.3399  | -1.8271  | -0.4436 | -2.3656 | 5.7094    | -4.1176  | -0.3512 |
| -4  | -1.5892 | -0.0288 | -0.5674  | -0.6072  | -1.026   | 0.1452  | -1.9237 | 5.7094    | -2.441   | -0.4226 |
| -3  | -1.6518 | -0.0487 | 0.0933   | -0.8364  | -1.5297  | -1.1376 | -1.3607 | 5.6839    | 1.7715   | -0.4467 |
| -2  | -1.3453 | -0.1718 | -0.0961  | 0.2283   | 0.0368   | -1.8292 | 1.8852  | 5.8239    | -4.1176  | -0.3258 |
| -1  | -1.3324 | -0.2015 | -33.6776 | -1.0609  | -1.5297  | -1.2819 | 0.5069  | 5.773     | 4.2027   | -0.3039 |
| 0   | -15.318 | -2.7531 | -1.5646  | -43.1127 | -32.9504 | -6.5344 | -40.449 | -101.0806 | -33.1402 | 2.0699  |
| 1   | -1.0997 | -0.0388 | 0.1227   | -0.2348  | -1.7438  | -0.4506 | -0.5716 | -1.8485   | 1.059    | -0.3799 |
| 2   | -1.6486 | 0.0316  | -0.2896  | -0.3255  | -2.6797  | -0.4633 | -0.1297 | 4.1571    | 1.562    | -0.2485 |

|           |         |         |         |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>3</b>  | -1.6518 | -0.2319 | 1.8815  | 1.3648  | -3.4213 | 0.4039  | -0.5821 | -1.8485 | -0.865  | -0.3338 |
| <b>4</b>  | -1.6518 | -0.0318 | 0.6318  | 0.1758  | -3.4253 | -0.8674 | -0.3507 | -1.7976 | 0.9039  | -0.4059 |
| <b>5</b>  | -1.6518 | 0.0174  | -0.3401 | -0.2062 | -3.4253 | -0.7462 | -0.5348 | 2.1849  | -1.2883 | -0.2853 |
| <b>6</b>  | -1.9134 | 0.0349  | -0.4117 | -0.1632 | -3.5046 | -0.7173 | -0.5874 | 2.9738  | -0.1943 | -0.4201 |
| <b>7</b>  | -1.1125 | -0.1144 | 1.1031  | 0.3429  | -3.4888 | -0.9644 | -0.0245 | 5.7984  | -0.5967 | -0.3873 |
| <b>8</b>  | -0.5604 | -0.085  | 0.068   | -0.2539 | -3.4689 | -0.9147 | -0.782  | 5.6712  | 1.8386  | -0.3611 |
| <b>9</b>  | 0.2838  | -0.1279 | 0.4972  | 0.3811  | -0.8198 | -1.021  | -0.6137 | -4.4569 | 4.2027  | -0.4    |
| <b>10</b> | -1.273  | -0.1262 | 0.7791  | 1.551   | 0.1161  | -0.0961 | -0.3507 | -6.8616 | 4.2027  | -0.4167 |
| <b>11</b> | -0.8365 | -0.1447 | 0.8001  | 2.5632  | -2.0175 | -0.9852 | -0.4506 | -1.8994 | -1.3177 | -0.4115 |
| <b>12</b> | 0.6433  | -0.081  | -0.2476 | -1.5192 | -1.2005 | -0.1919 | -0.1981 | -6.8616 | 3.0332  | -0.4959 |
| <b>13</b> | -1.525  | -0.1223 | 2.7357  | 0.7202  | -3.2548 | -0.8859 | -0.8873 | -3.9097 | -4.0506 | -0.3793 |
| <b>14</b> | -0.6792 | -0.0817 | -0.681  | 1.2072  | 0.358   | -0.1965 | -0.4401 | 1.4597  | 0.9039  | -0.3907 |
| <b>15</b> | -1.6839 | -0.0853 | -0.681  | -0.8126 | -0.0822 | -0.7866 | -0.3033 | 4.8442  | -1.4727 | -0.3042 |
| <b>16</b> | -1.0917 | -0.0407 | 2.0414  | -1.3951 | -1.7002 | -0.8027 | -1.0714 | 5.8112  | 4.1985  | -0.494  |
| <b>17</b> | 1.9433  | -0.1223 | 0.9853  | 2.8306  | -3.465  | -0.2797 | 0.0913  | 5.8239  | -0.6428 | -0.3824 |
| <b>18</b> | -0.3085 | -0.1061 | 0.0133  | -1.9251 | -3.4491 | -1.8119 | -0.8504 | 5.8239  | -3.0152 | -0.3932 |
| <b>19</b> | -0.6311 | -0.0978 | -0.4285 | 2.4916  | -1.375  | -1.2981 | -0.6032 | 0.6072  | 0.4931  | -0.6833 |
| <b>20</b> | 0.1987  | -0.1705 | 0.1185  | -0.4354 | -2.2118 | -0.6492 | -0.3822 | -1.6704 | 4.035   | -0.3917 |
| <b>21</b> | 1.64    | -0.0483 | -0.0624 | -2.1352 | -3.4729 | -0.9517 | -0.8504 | -2.3702 | 4.1985  | -0.3468 |
| <b>22</b> | -0.8622 | -0.0932 | 0.1564  | 0.1281  | -3.4491 | -0.7612 | 0.3175  | -3.299  | 4.1817  | -0.3889 |
| <b>23</b> | -0.3582 | -0.0308 | -1.9643 | 0.9875  | -3.4848 | 0.4131  | -0.1981 | -2.1793 | -2.0009 | -0.37   |
| <b>24</b> | -1.188  | -0.0652 | 0.413   | -5.7688 | -3.4491 | -0.5406 | -1.5607 | -4.635  | -3.9793 | -0.5939 |
| <b>25</b> | -1.2666 | -0.0397 | 0.5603  | 0.7345  | -2.6718 | -0.4794 | 0.4227  | -1.6958 | -3.4679 | -0.3843 |
| <b>26</b> | -0.4577 | -0.0698 | 0.1564  | -3.6154 | 0.4294  | -0.0742 | -0.4717 | 2.2104  | -1.4895 | -0.3168 |
| <b>27</b> | -0.9954 | -0.0249 | -1.817  | 0.2236  | -0.3598 | 0.1799  | -1.1556 | 5.773   | -0.8733 | -0.3833 |

|           |         |         |         |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>28</b> | -1.0066 | -0.1675 | 0.939   | 4.9936  | -1.3988 | -0.5799 | -0.035  | -5.004  | 0.9165  | -0.3954 |
| <b>29</b> | -1.2185 | -0.0061 | 0.7875  | 0.9493  | -1.9818 | -0.6353 | 1.8274  | -6.8616 | 0.8452  | -0.3604 |
| <b>30</b> | -1.0018 | -0.044  | -0.0161 | -4.8521 | -2.0373 | -0.8177 | 0.4385  | 1.9559  | 4.0308  | -0.3883 |
| <b>31</b> | -0.3085 | -0.0724 | -0.8324 | -1.801  | -2.763  | -0.6988 | -1.124  | -4.3296 | -2.3194 | -0.2856 |
| <b>32</b> | 0.0045  | -0.1276 | 0.5435  | -0.9558 | -3.0129 | -0.6041 | -0.6084 | -1.3014 | -2.2147 | -0.6119 |
| <b>33</b> | -1.0355 | -0.083  | 0.3121  | -0.8794 | -0.0504 | -0.7196 | -0.1981 | -2.0012 | -1.3344 | -0.4702 |
| <b>34</b> | 0.3078  | -0.0978 | 0.3541  | -0.7696 | 0.4096  | -0.7046 | -0.8978 | 0.2255  | 7.2416  | -0.5982 |
| <b>35</b> | 2.3333  | -0.078  | 0.6529  | -0.3446 | -1.3353 | -0.8674 | -0.5927 | 0.3909  | -1.0871 | -0.4099 |
| <b>36</b> | -0.3967 | -0.0189 | 1.0863  | 0.1615  | -2.7273 | -0.887  | 0.0281  | -2.79   | 2.1907  | -0.4133 |
| <b>37</b> | -1.3645 | -0.079  | 0.1395  | -1.376  | -1.9024 | -0.9182 | -0.8925 | -0.8942 | 2.5679  | -0.4334 |
| <b>38</b> | -1.3356 | -0.0982 | 0.3163  | 0.0087  | -1.5931 | -0.8097 | -1.6659 | 3.6863  | 4.1985  | -0.4854 |
| <b>39</b> | 0.9097  | -0.1421 | -0.458  | 0.214   | -1.7755 | -0.9101 | -1.0767 | 4.7169  | -1.1542 | -0.5333 |
| <b>40</b> | -0.7771 | -0.086  | -0.3738 | 0.6485  | -2.0769 | -0.842  | -2.1762 | -2.1284 | -3.8703 | -0.3657 |
| <b>41</b> | -2.6806 | -0.0972 | 0.4257  | -1.1707 | -1.0339 | -0.939  | 0.0544  | -0.9069 | 1.3188  | -0.4514 |
| <b>42</b> | -1.1559 | -0.0866 | -0.4411 | -0.5261 | 0.4136  | -0.0257 | -0.8662 | 1.1543  | -1.0494 | -0.3617 |
| <b>43</b> | 0.4378  | -0.0632 | -0.0666 | 2.2672  | -1.9778 | -1.0937 | 0.1123  | -4.7495 | 2.8446  | -0.3441 |
| <b>44</b> | 2.3253  | -0.0827 | -1.0344 | 1.3075  | -3.3063 | -1.1087 | -0.7505 | 5.2641  | -0.5464 | -0.3413 |
| <b>45</b> | -0.3646 | -0.1553 | -0.1676 | 4.7549  | -2.1325 | 0.0817  | -0.5874 | 0.3273  | 0.7195  | -0.3914 |

| <b>Cos.</b> | <b>21</b> | <b>22</b> | <b>23</b> | <b>24</b> | <b>25</b> | <b>26</b> | <b>27</b> | <b>28</b> | <b>29</b> | <b>30</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | -2.3512   | -2.5568   | 2.3285    | 0.2086    | -4.7882   | 2.2585    | -0.3004   | 0.5839    | -2.6569   | -1.2151   |
| <b>-44</b>  | -4.0312   | 2.7719    | -0.1145   | 0.9768    | 4.9673    | -5.8995   | -1.2964   | -0.072    | -2.627    | -0.6528   |
| <b>-43</b>  | -3.835    | -1.4422   | -0.1145   | -0.3107   | 10.9841   | 2.2159    | -2.1592   | -0.28     | -2.7868   | 0.7584    |
| <b>-42</b>  | -1.507    | -2.7763   | -0.1145   | -0.2485   | 0.9338    | -6.2264   | 1.1905    | 0.3152    | -2.7468   | 0.7801    |
| <b>-41</b>  | -3.5792   | 2.3683    | -0.1145   | 0.3235    | -1.4515   | -5.3737   | 1.2666    | -0.1673   | -2.7069   | 0.2106    |
| <b>-40</b>  | 2.3731    | -0.7345   | -0.1145   | -0.8492   | 1.4229    | -8.0599   | -1.6326   | 0.8122    | -2.6769   | -0.6129   |
| <b>-39</b>  | -4.0141   | -1.824    | 2.6783    | 0.3163    | -0.4465   | -7.9746   | 5.7456    | -0.1702   | -2.637    | 1.5419    |
| <b>-38</b>  | -0.3472   | -2.2047   | -2.5575   | -1.4738   | -0.6341   | -7.6477   | -1.2139   | -0.8839   | -5.6736   | 1.2626    |
| <b>-37</b>  | -0.3472   | 2.7204    | -0.1145   | 0.5723    | -0.7212   | 1.9885    | -2.616    | -0.0315   | -5.7635   | 1.0232    |
| <b>-36</b>  | 2.8336    | 2.2254    | 2.6783    | -1.2153   | 1.7177    | 5.6412    | -1.6326   | 0.1765    | -5.6836   | 1.1356    |
| <b>-35</b>  | 0.7102    | -2.5568   | -2.5575   | 0.5556    | 0.639     | 6.0675    | -3.6184   | -0.3869   | -5.7436   | 0.0365    |
| <b>-34</b>  | -1.9163   | 0.0818    | -0.1145   | 2.3409    | 5.9455    | 5.499     | -0.643    | -0.1818   | -5.7735   | -0.544    |
| <b>-33</b>  | 2.3219    | 0.0818    | -0.1145   | 3.2048    | 0.1029    | 6.1244    | -0.091    | -0.7221   | -5.8035   | -0.1812   |
| <b>-32</b>  | 2.9445    | 0.0818    | -0.1145   | 1.4339    | 2.6423    | 6.1528    | -1.4487   | -0.0662   | -5.8035   | -1.2985   |
| <b>-31</b>  | -3.5365   | 0.8981    | -0.1145   | 0.9265    | 0.5653    | 5.5701    | -0.7001   | 0.0956    | -5.8035   | 0.3883    |
| <b>-30</b>  | 0.7102    | -1.824    | -0.1145   | -0.3825   | -5.8133   | 1.7327    | 1.0573    | 0.8295    | -5.7835   | -0.3916   |
| <b>-29</b>  | -3.8862   | 0.0818    | -0.1145   | 1.2329    | 5.0142    | 4.8737    | -1.8864   | 0.4626    | -5.7635   | -0.4569   |
| <b>-28</b>  | -3.7071   | 0.961     | 2.6783    | -0.3945   | 13.3693   | -7.9888   | -0.5605   | 0.1014    | -5.7236   | -0.4533   |
| <b>-27</b>  | -3.5365   | 0.0818    | -0.1145   | -0.2509   | -0.6676   | -68.5065  | -1.5375   | -0.202    | -5.7835   | -0.0397   |
| <b>-26</b>  | 0.173     | -1.9966   | -0.1145   | -0.0427   | -0.5269   | -8.0172   | -0.0339   | 0.1592    | -5.7236   | -0.3843   |
| <b>-25</b>  | 3.0468    | 0.0818    | -0.1145   | 2.013     | 1.3358    | -8.003    | -1.4677   | 0.2545    | -5.7536   | 1.8467    |
| <b>-24</b>  | 2.6375    | -2.4585   | -0.1145   | 1.0941    | 0.2637    | -8.0172   | -2.7175   | 0.3557    | -5.7635   | -0.4678   |
| <b>-23</b>  | 4.3089    | 0.0818    | -0.1145   | 1.0534    | -0.6676   | -8.0599   | -0.3828   | 0.1043    | -5.7635   | 0.8491    |

|            |          |         |          |          |          |           |          |          |          |          |
|------------|----------|---------|----------|----------|----------|-----------|----------|----------|----------|----------|
| <b>-22</b> | 3.9507   | 0.0818  | -2.5575  | 1.2688   | -3.3544  | -7.3635   | 1.4633   | -0.8261  | -10.7381 | 0.1126   |
| <b>-21</b> | 3.5414   | 0.0818  | -0.1145  | -0.2365  | -0.815   | 0.7662    | -0.8142  | 0.139    | -10.798  | -2.3977  |
| <b>-20</b> | 1.887    | 0.0818  | -2.2858  | -0.3921  | 0.8802   | 6.1528    | -2.3686  | -0.0142  | -10.7581 | -0.8559  |
| <b>-19</b> | 1.3327   | 0.0818  | 2.3285   | -0.0666  | 3.319    | -5.7006   | 2.0787   | 0.8873   | -20.7471 | -1.7919  |
| <b>-18</b> | 3.8058   | 0.0818  | -2.2858  | 1.8216   | -4.5269  | -7.065    | -3.4154  | 1.445    | -14.7837 | -1.8354  |
| <b>-17</b> | 3.9593   | 0.0818  | -0.1145  | -0.0786  | -0.7413  | 5.3285    | -1.1315  | 1.3381   | -0.4094  | -1.9261  |
| <b>-16</b> | 4.1383   | 1.225   | -0.1145  | -1.8017  | 3.9556   | 6.1528    | -2.6985  | 1.3554   | -0.4893  | 0.6713   |
| <b>-15</b> | 4.3345   | -2.7763 | -3.6676  | -0.8181  | 4.0561   | 1.1073    | 2.3325   | 1.4479   | -0.1597  | 1.6471   |
| <b>-14</b> | 3.7887   | 2.3683  | 1.8399   | 0.3235   | -4.0177  | -0.8967   | -1.1949  | 1.445    | -0.3595  | -1.6685  |
| <b>-13</b> | 3.9422   | -1.1884 | -0.1145  | 0.2493   | -1.954   | -8.0457   | 1.0129   | 1.4363   | -0.2796  | 7.0886   |
| <b>-12</b> | -3.4427  | 1.225   | -0.1145  | -1.0813  | 0.8869   | -8.0172   | 2.3959   | 0.8642   | 0.0601   | -1.157   |
| <b>-11</b> | -3.9544  | 1.9876  | -3.3724  | -0.0523  | 6.9572   | -6.2406   | -1.3091  | -0.3378  | 0.1999   | -1.4545  |
| <b>-10</b> | -3.7668  | 0.0818  | 1.662    | -0.6817  | -0.0043  | -8.0599   | -1.6326  | -0.1269  | -0.5193  | -0.2429  |
| <b>-9</b>  | -3.5877  | -2.2047 | 1.8399   | -0.1863  | 0.2101   | -8.0314   | -0.3828  | -0.28    | -0.2196  | 0.5044   |
| <b>-8</b>  | -8.295   | -1.1884 | -1.891   | 0.5915   | -1.8535  | -8.0172   | 2.4149   | 0.4828   | -0.9888  | -1.7991  |
| <b>-7</b>  | -7.9965  | 1.225   | -3.1203  | -1.2512  | -1.351   | -6.667    | -1.8293  | 0.4106   | -0.3894  | -0.8088  |
| <b>-6</b>  | -8.1244  | 0.0818  | -2.7197  | -0.6242  | -2.5905  | 5.0016    | 1.457    | 1.3872   | -1.1186  | -1.2804  |
| <b>-5</b>  | -14.9892 | 0.0818  | 2.8913   | 0.424    | -1.3979  | 2.1448    | 5.0795   | 0.9971   | -0.3495  | -0.7144  |
| <b>-4</b>  | -15.3303 | -2.7763 | -1.5099  | -0.2318  | 0.056    | 4.0067    | -0.7952  | 0.451    | -0.4294  | -0.4678  |
| <b>-3</b>  | -2.8202  | -1.5519 | -3.564   | -0.416   | -1.3108  | 6.1244    | 1.9962   | -0.9677  | -1.2085  | -0.2864  |
| <b>-2</b>  | -5.4212  | 0.0818  | 1.107    | -0.7678  | -0.3125  | 6.1244    | -2.4764  | -0.332   | -1.1186  | -0.6963  |
| <b>-1</b>  | 6.1594   | -1.824  | 2.6783   | -0.9641  | 1.577    | 6.1386    | -4.995   | -0.358   | -0.6491  | 0.1272   |
| <b>0</b>   | -78.341  | 10.2202 | -15.5736 | -19.2909 | -59.7634 | -113.2338 | -51.7071 | -14.4556 | -49.7354 | -32.6883 |
| <b>1</b>   | -1.686   | 3.0988  | -0.6813  | 0.6776   | -0.5269  | 5.0158    | -0.9158  | -0.2713  | -0.1297  | 2.8152   |
| <b>2</b>   | 0.2924   | -3.452  | 0.1728   | 1.0582   | -0.5269  | 6.1528    | -0.884   | -0.7221  | -0.3095  | 0.022    |

|           |         |         |         |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>3</b>  | -9.233  | 0.6729  | -0.9412 | -1.4762 | 3.2185  | 6.1386  | 0.0676  | -0.4042 | -0.3295 | 0.236   |
| <b>4</b>  | -0.748  | 1.3131  | -0.906  | 1.7474  | 0.2972  | 6.1386  | -3.0157 | 0.3701  | 2.1678  | -0.9648 |
| <b>5</b>  | -2.3086 | -0.2806 | -0.1145 | -1.2967 | 3.6607  | 6.1528  | 0.6322  | 1.2254  | -0.749  | -1.0518 |
| <b>6</b>  | 0.5738  | 0.4339  | 0.1532  | -0.3777 | -0.5738 | 5.1864  | 0.6322  | 0.2025  | -0.6791 | 0.0437  |
| <b>7</b>  | -1.2938 | 0.4236  | 0.7239  | 1.1371  | -0.1986 | 2.7986  | -1.8293 | 0.5666  | -0.6791 | 0.4283  |
| <b>8</b>  | -0.0232 | -2.4128 | -1.6565 | 1.3094  | -0.7614 | 1.221   | -1.8166 | 0.6677  | -0.6292 | 1.2989  |
| <b>9</b>  | -0.0232 | 0.0818  | -3.8571 | 1.3094  | 1.9589  | 5.9681  | -1.233  | 1.0896  | -0.749  | 2.0824  |
| <b>10</b> | 0.9575  | 0.0818  | 0.3096  | -0.1576 | -0.3326 | 2.4575  | -0.3131 | 1.1821  | -0.0997 | 0.7946  |
| <b>11</b> | -0.0232 | -2.4585 | -1.8559 | 0.0195  | -0.2053 | -5.2742 | -0.5415 | 0.0552  | -0.8689 | -0.8668 |
| <b>12</b> | -2.4962 | 0.0818  | 1.1206  | 0.6178  | 0.5519  | -8.0457 | 0.0168  | 0.9769  | -0.1897 | 0.2759  |
| <b>13</b> | 0.2668  | 2.1602  | 1.6835  | -0.5883 | 2.4748  | -7.9462 | -1.455  | 0.2545  | 0.13    | -0.3227 |
| <b>14</b> | -0.586  | 0.0818  | 0.1122  | -0.5931 | 0.3039  | -8.003  | -0.5478 | 0.2748  | -0.8689 | 0.7801  |
| <b>15</b> | 1.2219  | 1.0341  | -3.9509 | -0.0618 | 0.0091  | -6.7807 | 1.7361  | 1.2081  | 0.1799  | 0.5661  |
| <b>16</b> | 1.3327  | -0.7345 | -3.9353 | -0.6482 | 0.6256  | 0.4962  | -1.4994 | 0.9971  | -0.5093 | 0.5697  |
| <b>17</b> | 3.9166  | 0.4762  | 3.7591  | -1.6461 | -0.7949 | 0.9226  | 0.4736  | 1.445   | -0.3894 | -0.0941 |
| <b>18</b> | 1.5118  | 0.4625  | 3.6672  | 0.3546  | 0.706   | -4.393  | 1.1017  | 0.844   | -1.0387 | -0.1159 |
| <b>19</b> | 5.8694  | 0.4511  | -0.3217 | -0.7846 | -0.2388 | 6.0818  | -1.2266 | 0.2025  | -0.1897 | -0.2211 |
| <b>20</b> | 0.5056  | -0.9208 | -3.9568 | -0.6458 | 0.2168  | 6.1528  | -0.5795 | 0.1043  | 0.2599  | -0.0034 |
| <b>21</b> | 0.2838  | -2.6517 | 3.675   | -0.5381 | 0.6256  | 6.1386  | -0.2687 | 0.8353  | -0.749  | 0.9071  |
| <b>22</b> | -0.5945 | -1.0066 | -0.8806 | -0.9712 | -1.6324 | 6.1386  | -1.8103 | 1.4277  | -0.2496 | -0.5149 |
| <b>23</b> | 1.2816  | 1.5109  | -0.4898 | -0.495  | 0.0024  | 6.1386  | -0.7254 | 0.3499  | 1.029   | 0.0691  |
| <b>24</b> | -0.2705 | 2.3683  | -1.1796 | -0.7056 | 1.0611  | 6.1528  | 1.2032  | 0.8469  | -0.6691 | -0.6492 |
| <b>25</b> | -2.8032 | -1.4285 | -0.1145 | 0.0411  | -1.0428 | 6.1386  | -1.3789 | 0.7082  | -0.769  | 1.6762  |
| <b>26</b> | -9.4377 | 0.8844  | 2.5043  | -0.2389 | -0.2656 | 6.1386  | -0.2877 | 1.4305  | -0.769  | 0.6495  |
| <b>27</b> | -1.669  | 0.0818  | 0.0887  | 0.0147  | 0.9137  | 13.245  | -1.0807 | 0.9393  | -0.819  | 0.6713  |

|           |          |         |         |         |         |          |         |         |         |         |
|-----------|----------|---------|---------|---------|---------|----------|---------|---------|---------|---------|
| <b>28</b> | -0.9186  | -1.2627 | -1.6174 | -0.002  | 0.2972  | 13.2592  | 0.5117  | -0.2135 | 0.5595  | 0.0002  |
| <b>29</b> | 4.1724   | 2.5444  | 0.0751  | 0.0674  | -0.9356 | 10.2745  | -0.1037 | 0.3759  | -1.0987 | -0.6492 |
| <b>30</b> | -16.8397 | -2.7763 | -1.0194 | 0.1105  | 0.4044  | 3.6514   | -0.1545 | -0.6672 | -0.1797 | 0.3085  |
| <b>31</b> | -6.1119  | 1.6057  | 1.2399  | -0.002  | 1.3693  | -0.0155  | -0.9158 | -0.2338 | -0.0698 | -0.232  |
| <b>32</b> | 1.2475   | 0.0818  | -0.1145 | 0.3378  | -1.619  | 0.9368   | -0.7191 | 0.2459  | -0.6691 | -0.0252 |
| <b>33</b> | 1.7762   | -0.9574 | -0.1145 | -0.3849 | -0.7547 | 5.4564   | -0.5859 | 1.4219  | -0.4793 | -0.1086 |
| <b>34</b> | 1.887    | -1.3176 | -0.8591 | -0.6051 | 0.7395  | -6.8376  | -0.4844 | 1.4363  | -0.2496 | 0.0655  |
| <b>35</b> | 1.0002   | 2.0196  | -0.2982 | -0.4424 | -2.3895 | 9.1517   | -0.072  | 1.3959  | -0.9189 | 0.3231  |
| <b>36</b> | -1.3023  | -0.7494 | -0.1145 | -0.2988 | 0.0962  | -10.2202 | 4.388   | 0.0061  | -0.2196 | -1.0373 |
| <b>37</b> | -3.9032  | -0.1297 | -1.6448 | -0.2365 | -0.078  | -7.5198  | -7.0886 | 1.3121  | -0.2096 | -0.3771 |
| <b>38</b> | 0.0365   | -0.3584 | -0.1145 | 0.2445  | -1.887  | 13.2592  | -9.3535 | -0.1384 | 2.9769  | 0.0147  |
| <b>39</b> | 1.1622   | 1.6057  | -0.6109 | -0.2653 | 5.0075  | -14.8535 | -1.842  | 1.4305  | -0.2196 | 0.5407  |
| <b>40</b> | 0.5311   | -2.4848 | -0.2787 | 0.1176  | 0.6122  | 13.2165  | -1.9752 | 1.4392  | 0.15    | -0.6673 |
| <b>41</b> | 1.5459   | 2.0196  | -0.7497 | -0.2844 | 1.0611  | 13.2592  | 2.0089  | 1.3728  | 0.2698  | 0.6024  |
| <b>42</b> | -1.2511  | 0.0818  | 0.3741  | -0.3586 | -0.9155 | -10.0639 | 0.4229  | -0.5805 | 0.17    | -0.0905 |
| <b>43</b> | -0.9527  | -1.9761 | -0.1145 | 0.7303  | -1.4984 | -5.5727  | -0.5478 | -0.3176 | -0.6791 | -0.8378 |
| <b>44</b> | 0.8126   | 1.9876  | -0.1145 | -3.2256 | 3.386   | -15.1094 | 2.3451  | -0.5632 | -1.2385 | -0.7471 |
| <b>45</b> | -0.1084  | 0.4511  | 0.3858  | -3.3812 | 0.0694  | 13.2165  | -3.1426 | -0.2135 | 0.2099  | -0.388  |

| <b>Cos.</b> | <b>31</b> | <b>32</b> | <b>33</b> | <b>34</b> | <b>35</b> | <b>36</b> | <b>37</b> | <b>38</b> | <b>39</b> | <b>40</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | -1.0003   | -0.5305   | 0.1988    | 0.2692    | 1.171     | 0.0414    | 1.2439    | -0.262    | -0.5768   | -0.2539   |
| <b>-44</b>  | 5.3247    | -0.3832   | -0.51     | 0.4599    | -0.791    | 0.4423    | 0.0686    | -1.8508   | 2.7637    | 0.7042    |
| <b>-43</b>  | 0.3674    | 0.1223    | -1.8697   | 0.2521    | 0.6126    | 0.4971    | -1.1966   | 0.3463    | 0.0373    | -0.2572   |
| <b>-42</b>  | 2.9954    | 0.0785    | 2.0012    | -0.3544   | 1.6423    | 0.2246    | -0.9526   | 0.3155    | -0.2772   | -0.3354   |
| <b>-41</b>  | 0.1046    | -0.1722   | -3.5794   | -0.802    | 0.6434    | 0.0821    | -0.4709   | -0.3749   | -0.8142   | -0.6808   |
| <b>-40</b>  | -0.0746   | 0.194     | -1.7034   | -0.1172   | -1.2521   | 0.0883    | -0.0214   | 0.3463    | -0.5086   | 0.1762    |
| <b>-39</b>  | -0.8391   | -1.048    | -1.3412   | 0.0026    | -0.4478   | 0.317     | 1.2567    | 1.0496    | 1.9241    | 0.6716    |
| <b>-38</b>  | 1.9741    | -0.2757   | -0.6955   | -0.0169   | -0.9294   | 0.068     | 0.2291    | -0.8395   | 1.755     | -0.0519   |
| <b>-37</b>  | 5.48      | -0.6857   | -0.832    | 0.548     | -0.8935   | 0.5566    | -1.5627   | 0.0357    | 0.8739    | -0.0519   |
| <b>-36</b>  | 0.4451    | -0.7853   | -0.9195   | -0.5501   | 0.9969    | 0.3859    | -0.5544   | 0.3925    | 1.31      | -0.4364   |
| <b>-35</b>  | 0.0449    | -0.1762   | -0.9877   | 0.0418    | 1.4272    | 0.0038    | 2.4898    | -0.3621   | 2.4107    | -0.4299   |
| <b>-34</b>  | -0.7674   | -1.1833   | -0.4995   | 1.174     | 1.1301    | 0.2215    | -0.2076   | -0.5623   | 5.8521    | -0.3778   |
| <b>-33</b>  | 0.0329    | -0.025    | -1.0717   | 0.2692    | -0.2326   | 0.685     | -5.0886   | -0.4981   | 0.0818    | 0.4565    |
| <b>-32</b>  | -0.8391   | -0.634    | -0.5975   | -0.3862   | 0.0389    | 0.851     | -2.0444   | -0.5751   | 0.4318    | 0.1013    |
| <b>-31</b>  | 1.777     | -0.63     | 0.057     | 0.0418    | -0.3044   | 0.1024    | 10.3187   | -0.2107   | 0.2657    | -0.9448   |
| <b>-30</b>  | -1.078    | 0.3373    | -0.3035   | 1.3477    | -0.1148   | -0.1763   | 10.3187   | 0.431     | 0.5416    | 0.6585    |
| <b>-29</b>  | -1.4184   | -1.6212   | -0.4837   | -0.1735   | -0.9447   | 0.2731    | -2.8665   | -0.2492   | -0.0428   | 0.3327    |
| <b>-28</b>  | -1.2571   | -1.8203   | -0.2037   | -0.0854   | -0.7244   | 0.3765    | -2.16     | -0.3903   | -0.6451   | -0.0779   |
| <b>-27</b>  | -0.4568   | -1.6849   | -0.9457   | -0.6772   | 0.8585    | 0.3107    | -0.5544   | -0.28     | 0.7285    | -0.3061   |
| <b>-26</b>  | 0.1285    | -0.845    | -0.4137   | -0.1832   | 1.0071    | 0.2261    | -1.6205   | -0.1465   | -0.4493   | -0.5537   |
| <b>-25</b>  | 0.7377    | -0.7932   | -0.5537   | 0.411     | -1.6209   | -0.2108   | 1.7384    | -0.6624   | 0.153     | -0.1757   |
| <b>-24</b>  | -1.066    | -1.056    | -0.9072   | -0.6381   | -0.3914   | 0.6537    | 0.531     | -0.3313   | -0.4671   | 0.072     |
| <b>-23</b>  | 0.9408    | -0.3872   | -0.5082   | -0.1563   | -1.2419   | -0.3063   | -1.2673   | -0.3416   | -1.5707   | -0.0779   |

|            |          |          |          |          |          |         |          |          |          |          |
|------------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|
| <b>-22</b> | 1.4664   | 0.6757   | -1.0612  | 1.1569   | 0.336    | -0.0808 | -3.5922  | -0.6367  | -0.4967  | -0.4234  |
| <b>-21</b> | -2.1948  | 0.6558   | -0.0235  | 0.5675   | 0.9866   | 0.674   | -2.7188  | -0.1722  | 2.4819   | -0.2474  |
| <b>-20</b> | 0.3913   | 0.389    | -0.7812  | -0.4547  | -0.0431  | 0.4313  | 1.4943   | -0.3595  | 0.6603   | 0.1958   |
| <b>-19</b> | -1.2273  | -1.6491  | -0.8582  | -0.2248  | -1.5492  | 0.2622  | -2.282   | -0.398   | -0.0428  | 0.3229   |
| <b>-18</b> | -3.5267  | -0.5225  | -0.7795  | 0.5406   | 1.2837   | 0.5581  | 2.8944   | -0.3493  | 1.0163   | -0.0258  |
| <b>-17</b> | -1.496   | -0.3832  | 0.1533   | 0.636    | 1.5809   | -0.1638 | -0.2975  | -0.2004  | -0.5442  | -1.0491  |
| <b>-16</b> | -2.3382  | -1.5217  | -0.4015  | 0.7192   | 1.504    | -0.0072 | -0.0214  | -0.3493  | -0.4048  | -0.0291  |
| <b>-15</b> | -0.4568  | 0.0308   | -0.8915  | -0.5794  | 0.4948   | 0.1823  | -0.9269  | -0.2415  | -0.2297  | 0.8247   |
| <b>-14</b> | 2.7445   | -0.3394  | -1.3202  | -0.5623  | 0.1516   | 0.1463  | -3.3096  | -0.7933  | -0.7786  | -0.8079  |
| <b>-13</b> | 2.7505   | -0.7057  | -0.2545  | 1.1227   | -0.0226  | 0.0461  | -0.4003  | -0.8395  | 0.414    | -0.3908  |
| <b>-12</b> | 2.7565   | -0.5663  | -0.93    | 0.6605   | -0.3607  | 0.389   | 0.4089   | 0.0075   | 1.752    | 0.1665   |
| <b>-11</b> | -1.5916  | -0.0608  | 0.6625   | -0.0487  | 0.0389   | 0.2763  | 1.52     | -0.357   | -0.9774  | 0.0198   |
| <b>-10</b> | -3.2102  | 0.3691   | -0.3227  | -0.2224  | -0.3453  | -0.0714 | -3.4316  | -0.5084  | -0.8528  | -0.6515  |
| <b>-9</b>  | -3.2162  | -1.0798  | -0.622   | 0.1273   | -0.0072  | 0.4736  | -1.993   | -0.6624  | -0.9625  | 0.4337   |
| <b>-8</b>  | -3.2162  | -0.2917  | -0.5082  | -0.621   | -0.3453  | -0.0526 | 1.0897   | -0.1029  | 1.5236   | -0.482   |
| <b>-7</b>  | -3.2162  | -1.3824  | -0.7795  | -0.5623  | -0.166   | 0.27    | 0.0429   | -1.3195  | 0.6009   | -0.9155  |
| <b>-6</b>  | -3.2221  | -1.1873  | -0.622   | 1.4675   | 1.6014   | 0.4704  | -0.6829  | -0.262   | -0.4196  | -1.7758  |
| <b>-5</b>  | -1.9739  | 0.6637   | -0.1232  | -0.8264  | 0.7202   | 0.2919  | -0.1755  | 0.5003   | -0.6955  | 0.6031   |
| <b>-4</b>  | 0.1703   | -0.2917  | 1.6862   | 0.4037   | -1.2828  | 0.1181  | -0.5159  | -1.6558  | -0.7311  | -0.7134  |
| <b>-3</b>  | 2.6251   | 0.0785   | -1.0927  | -0.1514  | -2.3382  | 0.3295  | -1.8838  | 0.8802   | -0.031   | -0.2507  |
| <b>-2</b>  | 2.7326   | -0.5703  | -0.3962  | 0.5382   | 0.3821   | 0.4172  | -51.0087 | -0.0952  | -0.3781  | 0.1241   |
| <b>-1</b>  | 2.7565   | -1.2032  | -0.1162  | -1.2715  | 0.254    | 0.0445  | 1.1539   | -0.6393  | 0.064    | 1.6916   |
| <b>0</b>   | -47.4256 | -19.4827 | -14.2751 | -19.6181 | -40.8009 | 0.4736  | -1.9738  | -20.8808 | -23.9726 | -24.8939 |
| <b>1</b>   | -3.2221  | -0.5265  | -0.5922  | -0.2737  | -0.1609  | 0.364   | -1.5756  | -1.3708  | 0.7849   | -0.1301  |
| <b>2</b>   | 2.0218   | 1.2409   | -1       | 0.0662   | 0.4128   | -0.1653 | -1.4407  | 0.0922   | -0.0933  | -0.4657  |

|           |         |         |         |         |         |        |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|--------|---------|---------|---------|---------|
| <b>3</b>  | 2.7505  | -0.2598 | 0.2705  | -0.2811 | -0.6066 | 0.151  | -2.1793 | -0.1337 | -0.6154 | 0.5119  |
| <b>4</b>  | 2.4758  | -0.5544 | -0.468  | -0.1172 | -0.289  | 0.0414 | -0.3938 | 1.296   | 0.6425  | 0.1371  |
| <b>5</b>  | 2.7505  | 0.0188  | -0.6115 | 1.2278  | -1.8156 | 0.5597 | -0.3104 | 0.2976  | 1.3842  | 0.0035  |
| <b>6</b>  | 1.8964  | -0.0289 | 0.008   | 0.4771  | -0.955  | 0.5018 | 6.8506  | -1.3837 | 0.5475  | -0.3028 |
| <b>7</b>  | 1.335   | -0.8291 | -0.8075 | 0.433   | -0.5759 | 0.2496 | 7.4993  | -0.9319 | -1.5707 | 0.3978  |
| <b>8</b>  | 5.5397  | -0.3076 | 0.148   | 0.2839  | -0.3249 | 0.2058 | 1.2888  | 0.2899  | -0.8261 | -0.4625 |
| <b>9</b>  | 1.7292  | -0.3315 | -0.356  | 0.01    | 0.838   | 0.1964 | 1.2053  | -0.9807 | 0.6395  | 0.7368  |
| <b>10</b> | 1.4126  | -0.7057 | -0.3052 | 0.0271  | 0.1823  | 0.4924 | -2.7701 | -0.3852 | -0.1912 | -0.205  |
| <b>11</b> | -0.9585 | -0.8967 | 0.6905  | 0.433   | -0.2326 | 0.4047 | -2.6995 | -0.244  | -1.2889 | 0.2512  |
| <b>12</b> | 1.5679  | 0.0427  | -0.5345 | -0.0414 | -0.0841 | 0.6145 | 0.5053  | -0.2877 | 0.7107  | 0.0524  |
| <b>13</b> | -0.1104 | -5.2954 | -0.832  | 0.1518  | -0.6476 | 0.4156 | -2.1343 | -0.819  | 0.331   | -0.0519 |
| <b>14</b> | 0.4749  | -1.0958 | -0.5292 | 0.6018  | -0.2941 | 0.9747 | -0.1626 | -0.6393 | 0.8947  | -0.5472 |
| <b>15</b> | -0.9466 | 0.7393  | -0.489  | 0.0002  | 0.5102  | 0.1244 | -1.9416 | -0.2235 | 0.3547  | -0.0845 |
| <b>16</b> | -0.9227 | -0.4071 | -0.559  | -0.7335 | 1.3913  | 0.3013 | -0.2847 | -0.629  | -0.6095 | 1.672   |
| <b>17</b> | -0.2418 | -0.8251 | -0.2807 | -0.2346 | 1.3862  | 0.5848 | 0.1007  | -0.878  | 0.7434  | 0.3815  |
| <b>18</b> | 1.0901  | -1.7844 | -0.895  | -0.105  | -0.2787 | 0.0508 | -1.0104 | 0.7673  | -0.4285 | -0.5961 |
| <b>19</b> | 0.7795  | 1.7783  | -0.3192 | 0.0246  | 0.0952  | 0.0335 | -0.2654 | 0.3848  | -0.2742 | -0.0388 |
| <b>20</b> | -1.6633 | 0.9782  | -0.216  | 0.1909  | 0.8227  | 0.259  | -0.882  | -0.7266 | 0.2865  | 0.6553  |
| <b>21</b> | -1.0302 | -1.5973 | -1.3342 | -0.1368 | 1.2325  | 0.2575 | -0.1562 | -0.5238 | 0.15    | 0.3392  |
| <b>22</b> | 1.2633  | 3.1357  | -0.2195 | -0.1588 | 0.2335  | 0.057  | 0.6594  | 0.1667  | -0.0992 | 0.1371  |
| <b>23</b> | 4.2496  | -1.0321 | -0.4645 | -0.4523 | -0.1046 | 0.3937 | -0.3104 | -0.5058 | -0.1912 | 0.1274  |
| <b>24</b> | 1.6933  | 3.4781  | -0.9527 | 0.2594  | -0.3761 | 0.1839 | -0.3617 | -0.1542 | 0.3013  | -0.0584 |
| <b>25</b> | 0.9229  | -0.3792 | -0.4522 | -0.2688 | -0.6578 | 0.1792 | -1.1388 | -0.0079 | -0.565  | 0.7922  |
| <b>26</b> | -1.8365 | 0.6836  | 0.141   | 0.1958  | -0.4683 | 0.0069 | 0.0172  | -1.2502 | -0.0488 | -0.1725 |
| <b>27</b> | -0.1761 | -1.1236 | -1.1855 | 0.0784  | -0.6066 | 0.2277 | -0.3938 | -0.1722 | -0.921  | -0.8829 |

|           |         |         |         |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>28</b> | -0.1283 | -0.7216 | -0.9702 | -0.0414 | 0.4077  | 0.5143  | -0.6251 | -0.1876 | 0.862   | 0.6585  |
| <b>29</b> | 1.6635  | 0.0268  | -0.4032 | -0.5892 | -0.2378 | -0.1967 | -0.381  | -0.5546 | 1.2596  | 1.5384  |
| <b>30</b> | -0.624  | 0.194   | 0.1358  | 0.9099  | -0.4222 | 0.0555  | 0.2163  | -0.8934 | -0.4048 | 0.1339  |
| <b>31</b> | 1.5022  | -0.2678 | -0.9615 | 1.3232  | -0.0124 | 0.378   | 1.1154  | -0.5161 | 0.2153  | -0.0584 |
| <b>32</b> | -0.4986 | -0.3474 | -1.5967 | 0.2276  | -0.5298 | 0.6255  | -0.5801 | -0.8395 | 2.0428  | 0.8541  |
| <b>33</b> | 1.1976  | -2.1347 | -0.5502 | -0.2322 | -0.622  | 0.555   | -0.0792 | 0.0383  | 0.6514  | 0.3913  |
| <b>34</b> | -1.1496 | 2.2003  | -0.0777 | 0.2423  | -0.3658 | 0.5816  | -0.3039 | -0.1054 | -0.117  | -1.023  |
| <b>35</b> | -1.6215 | -0.9843 | -0.5205 | 0.0491  | -0.9345 | 0.2355  | -1.5627 | -0.3467 | -0.2713 | -0.4234 |
| <b>36</b> | 0.021   | 3.6771  | 0.8165  | -0.0634 | -0.2634 | 0.1385  | 0.0686  | 0.0922  | 0.2894  | -1.0654 |
| <b>37</b> | -1.8425 | -0.5225 | -0.9702 | 0.2643  | 0.1157  | 0.3311  | 2.7724  | -0.5828 | 0.0402  | 0.6423  |
| <b>38</b> | 2.0457  | 0.4368  | -1.091  | -0.0438 | -0.3197 | -0.0307 | -3.7785 | -0.2851 | 0.4585  | -0.6124 |
| <b>39</b> | -2.1411 | -0.1484 | -0.4312 | 0.411   | 0.2745  | 0.627   | -1.7618 | 0.046   | -0.4018 | 0.0459  |
| <b>40</b> | -0.4807 | -0.021  | -0.2737 | -0.0316 | -0.2224 | 0.2089  | 0.0943  | -0.4725 | 0.1203  | -1.0654 |
| <b>41</b> | 1.6396  | 1.5235  | -0.23   | -0.1001 | -0.1865 | 0.6208  | 0.2034  | -0.3647 | 0.1263  | 0.9942  |
| <b>42</b> | -2.9713 | -0.3991 | -1.1627 | -0.3593 | 1.2581  | 0.2027  | 1.4558  | -0.5674 | -0.5709 | 0.1045  |
| <b>43</b> | -2.171  | -0.3991 | -0.468  | -0.1245 | 0.2335  | 0.0022  | 1.2824  | -0.4109 | 0.4823  | 0.0198  |
| <b>44</b> | -0.0089 | -0.6937 | -0.3035 | 0.2936  | 0.1567  | 0.2011  | -1.3058 | -0.3724 | 0.2093  | -0.8894 |
| <b>45</b> | 1.8606  | -0.3633 | -0.8582 | -0.2957 | 0.3411  | -0.1826 | 1.9054  | -0.2851 | 0.0135  | -0.9155 |

| <b>Cos.</b> | <b>41</b> | <b>42</b> | <b>43</b> | <b>44</b> | <b>45</b> | <b>46</b> | <b>47</b> | <b>48</b> | <b>49</b> | <b>50</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | -3.4911   | 1.3434    | -1.9556   | 3.4802    | 0.1027    | -4.6038   | 0.6117    | 0.4455    | -2.5094   | -4.7268   |
| <b>-44</b>  | -2.2921   | 5.4064    | -0.2648   | 0.2428    | -0.0003   | -4.3965   | -1.4237   | -0.0807   | -0.0232   | 2.7561    |
| <b>-43</b>  | -0.4496   | 3.5965    | 1.2507    | -2.6432   | -0.142    | 4.5138    | 0.6053    | -0.0807   | -1.3897   | 11.3202   |
| <b>-42</b>  | -0.1703   | -1.5007   | 1.3559    | 2.2254    | -0.0032   | -0.045    | 0.9025    | 0.5369    | 1.3813    | -5.5392   |
| <b>-41</b>  | -0.4675   | -1.4046   | 1.1281    | -1.4637   | 0.0448    | -4.3965   | 1.0963    | 1.2487    | 0.8309    | -11.7821  |
| <b>-40</b>  | -0.1931   | 0.1245    | 1.2201    | 0.9769    | -0.0111   | -4.2189   | -1.1264   | -0.2691   | -1.0923   | -7.9215   |
| <b>-39</b>  | 0.1891    | 0.2575    | 1.3208    | -3.4965   | 0.0712    | 2.8166    | 1.0543    | -0.8757   | -3.3255   | -11.8371  |
| <b>-38</b>  | -0.4888   | -0.0084   | -2.8886   | -3.1012   | -0.049    | -1.456    | 0.9865    | -0.3854   | -0.3142   | 0.783     |
| <b>-37</b>  | -0.8122   | -1.3899   | -2.7966   | 6.316     | -0.2129   | 1.3858    | -1.078    | 0.0051    | -2.1804   | -2.0269   |
| <b>-36</b>  | -0.2699   | -0.267    | -2.4112   | 0.2365    | -0.3531   | -4.1597   | -0.0377   | 0.0494    | 0.5336    | 0.105     |
| <b>-35</b>  | -0.2225   | 1.1883    | 0.4623    | -2.1287   | 0.1958    | -2.7092   | -0.5869   | 0.3569    | -1.1872   | 9.5365    |
| <b>-34</b>  | -0.2454   | -0.4738   | -2.398    | 7.966     | 0.009     | 2.6982    | -2.0633   | 0.4483    | -0.1181   | 4.9063    |
| <b>-33</b>  | -0.1654   | -0.3409   | -2.6345   | -4.6822   | 0.2136    | 2.7771    | 0.4082    | -0.5599   | 0.8878    | 6.9343    |
| <b>-32</b>  | -1.1879   | 0.8559    | -2.8404   | 24.203    | 0.0011    | -1.4363   | 0.6182    | 0.2239    | -0.9658   | 2.0536    |
| <b>-31</b>  | -0.5312   | 1.6241    | -3.0112   | -3.5467   | -0.0583   | -0.045    | -0.4027   | 0.0494    | 8.1695    | 1.9742    |
| <b>-30</b>  | 0.2169    | -0.2153   | -2.6608   | -3.3584   | -0.6723   | -4.0413   | 1.0802    | -0.1251   | 3.5133    | 2.3041    |
| <b>-29</b>  | -0.0575   | 0.6047    | -1.3511   | -1.4951   | -0.2415   | -0.045    | 1.1125    | 0.5369    | -2.7182   | -0.0355   |
| <b>-28</b>  | -1.3627   | -0.4147   | 1.0449    | -3.647    | -0.0468   | 4.1289    | -1.8243   | 0.0494    | -2.7878   | -1.3305   |
| <b>-27</b>  | -1.6126   | -1.412    | 1.1325    | -2.4299   | -0.4232   | 1.3661    | -2.0698   | -0.3439   | -2.7372   | 1.6321    |
| <b>-26</b>  | -0.4577   | 1.7719    | 1.2245    | -2.0911   | -0.0561   | 4.3756    | -2.0246   | 0.4926    | -1.5162   | 2.3529    |
| <b>-25</b>  | -0.198    | -1.3529   | -2.2578   | 1.3219    | -0.308    | -2.9066   | -2.0343   | -0.3439   | -0.2256   | -2.5339   |
| <b>-24</b>  | -0.2046   | 2.1339    | -2.9981   | -0.2717   | -0.0991   | 4.4447    | -2.0407   | -0.5488   | -0.9911   | 3.4586    |
| <b>-23</b>  | -0.6048   | 0.8337    | -2.8974   | -1.0496   | -0.1814   | 4.6519    | -2.0472   | 0.4843    | 3.4247    | 8.3087    |

|            |         |          |          |         |         |          |         |          |          |         |
|------------|---------|----------|----------|---------|---------|----------|---------|----------|----------|---------|
| <b>-22</b> | 0.0307  | -1.6484  | -1.3424  | -2.0221 | -0.1792 | 1.5437   | 1.1093  | 0.2239   | -2.1551  | 2.1697  |
| <b>-21</b> | 0.5387  | -2.0695  | -2.7791  | 2.3446  | 0.1056  | -4.6038  | 1.0996  | 0.1381   | 3.3235   | -0.4081 |
| <b>-20</b> | -1.8462 | -0.2744  | -2.2491  | -2.7561 | -0.1563 | -2.9954  | 1.1448  | -0.2552  | -1.1935  | -11.55  |
| <b>-19</b> | 0.0846  | -0.3409  | -2.8579  | -0.5038 | 0.4727  | -4.2781  | 1.1254  | 0.5341   | -2.3133  | -2.8454 |
| <b>-18</b> | 0.0944  | -0.1414  | -1.9293  | 0.4938  | -0.1878 | 2.856    | 1.1028  | -1.2136  | -0.3268  | 8.0338  |
| <b>-17</b> | -0.6521 | -1.4933  | -2.9193  | -2.6432 | -0.084  | -4.2189  | 1.1319  | 0.3486   | -0.9784  | 6.7755  |
| <b>-16</b> | -0.6717 | -0.3261  | 1.3559   | 0.2303  | -0.127  | -0.045   | -0.897  | -0.2857  | -0.4913  | 5.6821  |
| <b>-15</b> | -0.3418 | 3.2789   | -0.8343  | -3.6345 | 0.0326  | -1.4166  | -2.0472 | -0.0752  | 0.4766   | 0.8319  |
| <b>-14</b> | -0.0739 | 1.4986   | -1.903   | -0.6795 | -0.0347 | 2.7771   | 0.8896  | 0.3873   | -0.5546  | 0.6853  |
| <b>-13</b> | -0.6995 | 0.1984   | -2.8711  | -0.6732 | 0.1242  | -1.4363  | 1.1319  | -0.2442  | -0.1813  | -1.6115 |
| <b>-12</b> | -0.033  | -0.6216  | 0.2082   | 1.3533  | -0.2014 | -4.0413  | 1.106   | -0.92    | -1.4023  | 4.0572  |
| <b>-11</b> | 0.537   | -1.5376  | -2.8273  | -0.0081 | -0.1907 | -1.3574  | -1.8437 | 0.8831   | -0.137   | -1.5443 |
| <b>-10</b> | 0.3622  | -0.4073  | -2.7397  | 1.8552  | -0.049  | -0.045   | -2.073  | -0.3217  | -0.0738  | -0.7685 |
| <b>-9</b>  | 0.1352  | -0.2079  | 1.1588   | -2.2542 | 0.0297  | -1.3475  | -2.0407 | -0.2359  | 0.7929   | -1.5809 |
| <b>-8</b>  | -0.3124 | 0.9297   | 1.2507   | -0.234  | 0.0834  | 4.0105   | 0.9348  | -0.4685  | 0.4323   | -0.5181 |
| <b>-7</b>  | 0.8556  | -4.1749  | 1.3559   | 3.5429  | -0.0669 | -3.9426  | 1.4129  | -0.8757  | -2.5284  | 6.751   |
| <b>-6</b>  | -0.0853 | 0.2427   | 0.2871   | -1.3947 | -0.1943 | -3.7946  | 2.2336  | 0.2433   | 0.9448   | 1.0274  |
| <b>-5</b>  | -0.4185 | -0.6364  | 0.3178   | -2.455  | -0.2358 | -4.8011  | 2.492   | -0.1057  | -2.0033  | 4.1672  |
| <b>-4</b>  | -0.9837 | -1.9661  | 0.3484   | -0.0081 | 0.1886  | -4.584   | 0.6376  | 1.3845   | -2.5853  | -5.1361 |
| <b>-3</b>  | -1.0246 | 1.8088   | 0.3835   | -0.4473 | -0.3173 | -4.3867  | 0.1756  | 1.5894   | -1.1935  | 7.8261  |
| <b>-2</b>  | -0.9331 | -0.5699  | 0.4185   | 3.0034  | -0.3567 | -3.1927  | -0.5837 | -1.5598  | 1.5837   | 3.538   |
| <b>-1</b>  | 0.0568  | 0.4274   | 0.4535   | -2.455  | -0.2014 | 3.2113   | -1.6272 | 2.0354   | 4.8102   | -2.711  |
| <b>0</b>   | 12.6801 | -64.0116 | -40.2172 | -4.356  | -5.8332 | -89.3061 | 28.7871 | -24.8343 | -50.6784 | 53.6032 |
| <b>1</b>   | 0.3622  | -3.0298  | 1.3471   | 3.2606  | -0.2336 | -1.3672  | -0.9067 | 0.8665   | -0.3015  | -9.0638 |
| <b>2</b>   | 0.8114  | -0.6511  | -0.6985  | -1.4951 | 0.2602  | -2.2356  | -0.5934 | -0.679   | 0.7866   | -2.2468 |

|           |         |         |         |          |         |         |         |         |         |          |
|-----------|---------|---------|---------|----------|---------|---------|---------|---------|---------|----------|
| <b>3</b>  | -0.4104 | 0.8042  | 1.3208  | -14.4257 | -0.3968 | -0.1437 | -1.5917 | 0.2045  | 5.4555  | -2.314   |
| <b>4</b>  | 0.671   | 4.5126  | 1.2726  | -4.9834  | -0.0697 | 4.869   | -2.2572 | -0.4325 | 0.3248  | -1.5626  |
| <b>5</b>  | -1.0115 | 0.0876  | 1.0493  | 9.1518   | 0.0455  | 4.7802  | -0.0797 | 0.0023  | 1.084   | -8.4224  |
| <b>6</b>  | -0.7142 | -2.2837 | -0.1991 | 15.7834  | -0.1442 | 4.7901  | -1.1943 | -0.4574 | -0.0105 | -1.9474  |
| <b>7</b>  | -0.3532 | -1.1682 | 0.1425  | 10.6199  | 0.1378  | -4.6531 | -0.8615 | 0.0993  | -0.0295 | -5.6003  |
| <b>8</b>  | -0.4512 | -0.9318 | -3.0025 | -0.761   | 0.3546  | 0.399   | 0.5536  | 0.8194  | 1.1029  | 0.2089   |
| <b>9</b>  | -0.5525 | -0.9983 | -2.8974 | -4.425   | -0.3116 | 3.7342  | 0.0011  | 0.5092  | -0.9658 | 1.6138   |
| <b>10</b> | -0.3483 | -0.8358 | -2.9412 | 6.1152   | -0.0633 | -4.9393 | -0.7    | 0.2018  | -0.8835 | -0.8785  |
| <b>11</b> | -0.479  | 0.2206  | -2.8448 | 1.5603   | -0.0604 | 4.869   | 0.1109  | 0.0716  | -0.1117 | -2.0024  |
| <b>12</b> | 0.292   | -0.2965 | -2.3849 | 1.598    | -0.2136 | 4.869   | 0.3403  | 0.2156  | 0.483   | -2.1551  |
| <b>13</b> | -0.0249 | 0.457   | -2.8098 | -45.7578 | 0.1707  | 4.8591  | -0.7064 | 0.5175  | 0.7487  | -12.4663 |
| <b>14</b> | 0.1434  | -0.7915 | -1.9162 | 5.011    | 0.3911  | 4.8394  | 0.3436  | 0.3929  | -1.4719 | -0.8235  |
| <b>15</b> | -0.0428 | 0.5161  | -2.7879 | 1.1086   | -0.2873 | 4.8098  | 1.3903  | -0.2137 | -1.4719 | -0.4814  |
| <b>16</b> | -0.3695 | 0.0137  | -2.9149 | -5.0022  | 0.0476  | 4.7506  | -2.1021 | 0.332   | 1.9823  | 1.3267   |
| <b>17</b> | -0.0265 | 0.4126  | -3.02   | 5.0738   | 0.0398  | 3.1027  | 0.2919  | 0.3347  | 0.0781  | 1.0763   |
| <b>18</b> | -0.02   | 1.011   | -3.0112 | 5.0549   | 0.0913  | -2.3836 | -0.2767 | 0.9247  | -2.1425 | -1.2572  |
| <b>19</b> | -0.7469 | -0.0011 | 1.2376  | 4.9985   | 0.0548  | 2.5107  | -0.4706 | -0.0032 | -0.5229 | 1.8093   |
| <b>20</b> | -0.2029 | 0.1393  | 0.5543  | 4.7789   | -0.3395 | -4.8998 | -0.0409 | -0.0697 | 0.8752  | -0.909   |
| <b>21</b> | -0.3973 | 0.3979  | -2.9674 | 2.9155   | -0.0275 | -3.6269 | -0.8647 | -0.2829 | 1.318   | 0.722    |
| <b>22</b> | -0.2617 | 1.0997  | -2.9631 | -4.105   | 0.034   | -3.7552 | -0.0829 | -0.1583 | -0.3331 | 1.0152   |
| <b>23</b> | -0.4398 | 4.0915  | -2.9499 | 4.7161   | 0.122   | 0.626   | 0.5633  | 0.1021  | -1.4466 | 1.2962   |
| <b>24</b> | -0.1915 | -0.171  | -2.9368 | -0.7359  | 0.1299  | -3.6466 | -0.3317 | -0.5571 | 0.0021  | -1.7214  |
| <b>25</b> | -0.2536 | 0.3462  | -2.9981 | 2.9218   | 0.253   | -2.9164 | -0.2154 | -0.2525 | 0.0591  | -0.6708  |
| <b>26</b> | -0.0526 | -0.3483 | -2.9718 | 4.6534   | 0.3303  | 4.7999  | -0.616  | 0.03    | -1.6047 | -0.2493  |
| <b>27</b> | -0.314  | 1.4099  | -3.0156 | 0.82     | -0.5241 | 4.7605  | -0.5126 | 0.5231  | -0.1054 | -3.9632  |

|           |         |         |         |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>28</b> | -0.1686 | -0.2744 | -2.9806 | -2.7185 | -0.1456 | 4.8493  | -1.3461 | -0.6042 | -0.3142 | 0.1966  |
| <b>29</b> | -0.4185 | 1.5577  | -3.0112 | 2.8277  | -0.1835 | 4.7901  | -0.0377 | 0.2738  | -0.3838 | -1.9719 |
| <b>30</b> | -0.3336 | 1.2843  | -2.8448 | -1.0559 | -0.3045 | 4.869   | 0.098   | 1.4786  | 0.5083  | 0.4349  |
| <b>31</b> | 0.0307  | -0.0528 | -2.5207 | 1.1776  | -0.585  | -2.9658 | -2.6352 | 0.3957  | -0.428  | 1.3023  |
| <b>32</b> | 0.1156  | -1.7371 | -2.3411 | 3.0975  | -0.2765 | -2.5908 | -0.0958 | -0.2442 | -0.0864 | -0.3592 |
| <b>33</b> | 0.127   | -2.7269 | -0.2254 | -1.815  | 0.039   | 4.8295  | 0.6279  | -0.2746 | -0.6874 | -0.4692 |
| <b>34</b> | -0.1768 | 1.2105  | -2.5951 | -0.1274 | -0.3638 | 4.7407  | -4.8192 | 0.1159  | 0.2236  | 5.5904  |
| <b>35</b> | -0.0085 | 0.9519  | 0.4316  | 0.1111  | -0.1506 | 4.7999  | -0.2606 | -0.5267 | 0.5462  | 2.9882  |
| <b>36</b> | -0.2797 | 2.2373  | -0.8343 | -0.0081 | 0.1242  | 4.8591  | -1.1523 | 0.1491  | -1.2252 | -1.2144 |
| <b>37</b> | -1.2516 | 2.3481  | -0.9525 | -4.4878 | -0.0225 | 4.721   | 0.4308  | -0.1195 | 1.1472  | -6.199  |
| <b>38</b> | -0.1768 | 2.1782  | -1.43   | 0.3306  | 0.3589  | 4.7506  | -0.5029 | 0.4649  | -0.3078 | 0.4837  |
| <b>39</b> | -0.4218 | -0.6807 | 0.3221  | -0.3469 | -0.1198 | 4.7703  | -0.057  | 0.5397  | 0.8056  | -1.978  |
| <b>40</b> | -1.1585 | -0.0675 | -0.6503 | 0.2177  | 0.2881  | 4.7901  | 0.5859  | 0.0162  | -0.8393 | 0.7097  |
| <b>41</b> | -1.8445 | -0.4369 | -4.1151 | 2.0811  | 0.0519  | 4.7999  | -0.0344 | -0.3162 | 0.9638  | 1.9009  |
| <b>42</b> | 1.1332  | 0.058   | -1.9381 | -4.3372 | -0.3181 | 4.7901  | 0.0431  | -0.1638 | -0.2003 | 0.6609  |
| <b>43</b> | -0.1964 | -1.6115 | -1.281  | -0.0081 | -0.1356 | 4.7703  | 0.518   | 0.03    | -0.6621 | -0.1454 |
| <b>44</b> | -0.002  | 0.3166  | -0.1115 | -0.0081 | 0.0519  | 4.7407  | -1.527  | 0.091   | -0.0991 | -3.3219 |
| <b>45</b> | -0.9478 | 0.095   | 3.5372  | 0.8702  | -0.2866 | 4.6914  | -1.3364 | -0.294  | -0.3078 | 5.5904  |

| <b>Cos.</b> | <b>51</b> | <b>52</b> | <b>53</b> | <b>54</b> | <b>55</b> | <b>56</b> | <b>57</b> | <b>58</b> | <b>59</b> | <b>60</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | 1.0549    | -0.5857   | 3.949     | -4.5518   | -0.4841   | 0.3759    | -3.2245   | 3.0198    | 0.2789    | -0.5705   |
| <b>-44</b>  | -1.2165   | 3.4596    | 8.3476    | 0.4629    | -0.7603   | -0.1778   | -1.8895   | -0.4995   | -1.6829   | -0.5586   |
| <b>-43</b>  | 0.1775    | 7.0987    | -7.2658   | -3.119    | -0.5362   | 0.6141    | -3.4756   | -3.0626   | -0.064    | -0.5755   |
| <b>-42</b>  | -0.1551   | 7.1664    | -1.5349   | -1.0525   | -0.3405   | -0.7733   | -1.6078   | -2.7304   | -1.5147   | -0.567    |
| <b>-41</b>  | -1.3651   | 7.8942    | 0.3428    | -0.5014   | -0.1007   | -1.4059   | -2.3059   | -0.174    | -1.9749   | -0.7323   |
| <b>-40</b>  | -0.148    | 7.9789    | -1.1732   | 0.6214    | -0.0738   | -0.8182   | 0.1253    | 1.7789    | -1.0829   | -0.7789   |
| <b>-39</b>  | 2.18      | -3.8101   | -1.489    | 1.7993    | -0.3626   | -0.7331   | -3.0653   | 0.0498    | -0.0195   | -0.7793   |
| <b>-38</b>  | -2.4832   | -2.0413   | 0.8309    | 1.8682    | -0.0328   | -0.2397   | -2.6917   | -3.4559   | -1.4861   | -0.7793   |
| <b>-37</b>  | -2.4053   | -4.2332   | -0.7138   | -2.8021   | -0.5346   | -0.6403   | -3.445    | -3.4288   | -2.1051   | -0.7793   |
| <b>-36</b>  | -0.0702   | 0.6415    | -5.1698   | 2.8876    | -0.1196   | -0.5429   | 0.8296    | -2.8999   | 0.9169    | -0.7783   |
| <b>-35</b>  | -1.443    | -3.497    | -3.2404   | 0.6971    | 0.0824    | 0.447     | 2.5688    | 1.0262    | 1.0502    | -0.5229   |
| <b>-34</b>  | 2.8664    | 0.9461    | 1.543     | -3.7872   | -0.825    | -0.2103   | -1.4547   | 3.2368    | 1.0629    | -0.5645   |
| <b>-33</b>  | -2.2638   | -1.9144   | 3.1795    | 1.262     | -0.2348   | 0.1052    | -3.5062   | 3.2571    | -0.3719   | -0.6083   |
| <b>-32</b>  | -1.5774   | 5.7277    | -1.9713   | -4.228    | -0.1228   | -0.2629   | -3.5123   | 2.3146    | 0.0217    | -0.66     |
| <b>-31</b>  | 3.0362    | 1.0307    | -1.9599   | -4.5104   | 0.3033    | 0.0836    | -0.2789   | -0.0248   | -0.1782   | -0.4903   |
| <b>-30</b>  | -1.6057   | -7.5507   | -0.3405   | 3.3698    | -0.1401   | -0.6217   | -2.8632   | 1.2907    | -0.7972   | -0.7348   |
| <b>-29</b>  | 3.107     | -1.2712   | -2.6662   | -2.4577   | 0.4958    | 0.181     | 1.5583    | -1.164    | -1.867    | -0.5927   |
| <b>-28</b>  | -4.6909   | 0.9207    | -2.0575   | 0.7729    | -0.1811   | -1.2837   | -3.5001   | 0.9042    | 0.5614    | -0.5855   |
| <b>-27</b>  | 3.2343    | -1.2712   | 1.3592    | 5.1608    | -0.26     | 0.1098    | -3.5368   | -3.3271   | 1.0598    | -0.6318   |
| <b>-26</b>  | 2.7956    | -3.6324   | -0.576    | -2.9537   | -0.4526   | -1.2667   | -3.5184   | -0.5402   | -0.1084   | -0.7364   |
| <b>-25</b>  | -1.2731   | -3.5054   | -0.375    | -0.5014   | -0.1086   | -2.5922   | -1.9017   | 3.2707    | -0.702    | -0.624    |
| <b>-24</b>  | -4.4079   | 7.1834    | -6.0369   | -2.8435   | -0.2506   | 2.8645    | -1.4179   | 3.2775    | -0.5433   | -0.5266   |
| <b>-23</b>  | -0.1056   | 7.9196    | 0.762     | 8.908     | -0.1638   | 0.5723    | 0.2417    | 3.2775    | -1.2417   | -0.6202   |

|            |         |          |          |          |         |         |          |          |          |         |
|------------|---------|----------|----------|----------|---------|---------|----------|----------|----------|---------|
| <b>-22</b> | 4.1684  | -3.0061  | 0.5897   | 3.5834   | -0.0802 | -0.365  | -0.9525  | 3.2639   | -0.1687  | -0.5445 |
| <b>-21</b> | 0.7011  | -7.9231  | -3.0394  | -2.0031  | -0.8913 | 1.4245  | 0.4193   | 3.2436   | -0.6131  | -0.5573 |
| <b>-20</b> | -4.4645 | -8.5578  | 0.0098   | -2.9537  | -0.4526 | -0.3232 | -0.3585  | 3.2165   | -0.8226  | -0.4825 |
| <b>-19</b> | -4.8112 | 0.4891   | 4.7127   | 0.9245   | -0.795  | 0.7734  | 1.84     | 3.169    | -1.0417  | -0.6963 |
| <b>-18</b> | -0.7354 | -1.432   | -1.8737  | 1.1655   | -0.5788 | 0.3465  | -2.5202  | 3.2232   | -0.2481  | -0.5022 |
| <b>-17</b> | 0.6374  | 0.4891   | -2.3561  | 4.6717   | -0.2821 | -0.9775 | -0.3585  | -0.7368  | -1.6607  | -0.6591 |
| <b>-16</b> | -2.6247 | -1.1612  | -0.1683  | -0.5428  | -0.3847 | 0.3573  | -2.1344  | -1.2454  | -1.3083  | -0.7145 |
| <b>-15</b> | -1.0113 | 1.0477   | -4.2338  | -3.7458  | -0.279  | 0.6744  | 0.4131   | 0.6397   | -0.9274  | -0.6791 |
| <b>-14</b> | -2.2567 | -4.3094  | -1.8163  | -1.9893  | -0.1449 | -0.4021 | 0.1192   | -0.8317  | -0.1497  | -0.6803 |
| <b>-13</b> | -2.8865 | 2.3933   | 1.5257   | 0.3183   | 0.4106  | 1.4075  | 0.8847   | -2.6083  | -0.5242  | -0.5329 |
| <b>-12</b> | 5.4633  | 2.4779   | -3.516   | -3.1534  | 0.2197  | 0.7347  | -4.6085  | -3.8899  | -0.2957  | -0.485  |
| <b>-11</b> | -3.0422 | 2.5795   | -3.0452  | -3.5943  | -0.4036 | 0.4888  | 2.5443   | -5.7479  | -1.6194  | -0.6591 |
| <b>-10</b> | -3.955  | -4.5041  | 0.9113   | 4.2102   | 0.0272  | 0.1825  | -1.1301  | -0.9606  | 0.1392   | -0.696  |
| <b>-9</b>  | -0.8273 | -4.3094  | 6.1713   | 6.9586   | -0.4068 | 0.3465  | -2.955   | -5.619   | 0.4789   | -0.6976 |
| <b>-8</b>  | 4.4019  | -4.1317  | -2.4709  | 0.6076   | 0.0792  | -0.8073 | 1.4175   | 0.2939   | 0.9995   | -0.6058 |
| <b>-7</b>  | -1.3014 | -3.9709  | -4.1477  | -6.7836  | -0.1622 | 0.0897  | -6.5927  | -11.3489 | 1.0566   | -0.4841 |
| <b>-6</b>  | -3.6932 | -1.5335  | -0.6219  | -5.1648  | 0.1865  | 1.4091  | -6.5069  | -5.5716  | -1.2607  | -0.7138 |
| <b>-5</b>  | -1.2236 | 3.3919   | 1.2329   | -1.2729  | -0.0975 | -3.1722 | 0.2111   | 2.4231   | -0.2512  | -0.6062 |
| <b>-4</b>  | -3.3323 | 3.5697   | -0.4783  | -7.3553  | 0.0887  | -0.2026 | -1.0076  | -6.9074  | -1.5242  | -0.4709 |
| <b>-3</b>  | -0.2683 | -4.0724  | -0.7827  | 0.5525   | -0.4336 | -0.1794 | 5.5818   | -4.351   | 0.5995   | -0.4781 |
| <b>-2</b>  | -67.265 | -0.3403  | -0.4726  | 13.4612  | -0.107  | 0.2243  | 5.5512   | -4.1001  | 0.9963   | -0.5605 |
| <b>-1</b>  | 0.1209  | 3.5697   | -4.1362  | 5.333    | 0.1171  | 0.0696  | 5.4532   | -1.5708  | 1.0534   | -0.624  |
| <b>0</b>   | 0.5525  | -76.1857 | -51.6827 | -61.9522 | 7.7784  | 6.4373  | -48.3092 | -61.7986 | -29.1033 | 1.8693  |
| <b>1</b>   | 0.5666  | -2.9638  | -1.1272  | 0.1599   | -1.1958 | -0.0479 | -1.8099  | 1.9688   | -1.0036  | -0.7661 |
| <b>2</b>   | 0.694   | 2.5033   | 0.5266   | 1.3033   | -0.219  | 0.1501  | -0.3891  | -0.0112  | -1.1496  | -0.5069 |

|           |         |         |         |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>3</b>  | 0.9983  | -0.3403 | 1.0951  | -1.4451 | -0.5094 | 1.9009  | 0.6091  | 0.7075  | -0.3687 | -0.7739 |
| <b>4</b>  | -0.6292 | -2.583  | 5.8842  | -1.2178 | 0.1408  | 0.8801  | 5.6124  | -0.0316 | -1.7432 | -0.7151 |
| <b>5</b>  | 0.1209  | 0.3199  | 0.3256  | 1.6891  | -0.3453 | 0.331   | 5.6124  | -0.2147 | 0.0821  | -0.7749 |
| <b>6</b>  | -0.332  | 2.2579  | 0.4691  | -1.0181 | -0.3674 | -0.2289 | 5.6246  | 0.7143  | 1.0598  | -0.5107 |
| <b>7</b>  | -0.608  | 2.6387  | -0.1338 | -0.3637 | -0.1606 | -3.2155 | -1.6568 | 1.5687  | -2.0829 | -0.9189 |
| <b>8</b>  | 1.9253  | 3.8235  | 0.3543  | 0.3665  | -0.0312 | -1.6456 | -0.4197 | 0.4024  | -2.0987 | -0.4938 |
| <b>9</b>  | 1.3662  | 3.8743  | -1.0985 | 1.1793  | -0.2174 | -0.5289 | -5.2393 | -0.7165 | 0.7106  | -0.6127 |
| <b>10</b> | -0.3745 | 3.2396  | 0.5553  | -1.7827 | -0.1985 | -0.2258 | -4.3207 | 2.2197  | -0.3719 | -0.4359 |
| <b>11</b> | -0.5018 | -1.1442 | -0.9492 | -1.1627 | 0.0445  | 0.6883  | -2.3488 | -1.9709 | -0.9909 | -0.6381 |
| <b>12</b> | -1.2802 | -1.4574 | -1.0813 | 1.0347  | -0.4431 | -0.0819 | -1.0811 | -0.7843 | -1.1083 | -0.6772 |
| <b>13</b> | 0.503   | -1.5928 | 4.305   | -0.6805 | -0.533  | -0.2474 | 0.3335  | 0.7686  | -0.5306 | -0.5889 |
| <b>14</b> | 0.5596  | -4.5125 | -0.1338 | -1.5622 | -0.2695 | -0.0866 | -3.3164 | 1.4263  | -1.9337 | -0.624  |
| <b>15</b> | 5.4704  | -0.4926 | 1.0549  | -0.6254 | -0.2537 | 0.4702  | 0.1988  | -0.3435 | 0.5043  | -0.6922 |
| <b>16</b> | 3.3476  | 1.9532  | -1.0698 | 0.215   | 0.1139  | -0.5661 | -0.7504 | -0.0723 | 1.0629  | -0.8268 |
| <b>17</b> | 5.4562  | 3.8235  | -1.3627 | -0.4601 | -0.2048 | 0.8538  | 0.0457  | -0.3435 | -0.4766 | -0.6944 |
| <b>18</b> | 1.0124  | 3.5104  | 0.004   | -1.1971 | -0.2869 | 2.815   | -2.4406 | 0.8906  | -0.2766 | -0.5182 |
| <b>19</b> | -5.2358 | 2.4271  | 0.0212  | 1.0416  | -0.3579 | 0.4207  | -1.3995 | 0.1515  | -0.7211 | -0.7135 |
| <b>20</b> | 1.529   | 0.7092  | 0.5725  | -0.0744 | -0.391  | -0.597  | -6.6049 | -1.7471 | -0.1306 | -0.4866 |
| <b>21</b> | 2.3144  | 3.8912  | 0.7103  | -1.8584 | -0.2096 | 0.3898  | 4.1243  | 1.311   | -0.3465 | -0.639  |
| <b>22</b> | 0.2978  | 3.5104  | 3.3346  | 0.6489  | 0.1581  | -0.0788 | -2.7101 | 0.755   | -0.1528 | -0.5761 |
| <b>23</b> | -1.0892 | 3.2734  | -0.2429 | -2.1891 | -0.724  | -0.3727 | -2.0977 | -2.3506 | -0.6703 | -0.7624 |
| <b>24</b> | 3.7792  | -0.9411 | -3.4012 | -0.9629 | -0.2332 | 0.8476  | 1.0684  | 1.1347  | -2.1114 | -0.5201 |
| <b>25</b> | -2.2072 | -4.5041 | 1.3994  | -1.5209 | -0.2064 | 0.9404  | -4.2533 | 0.4227  | -1.8575 | -0.573  |
| <b>26</b> | -1.3298 | 2.5964  | -3.338  | 0.1667  | 0.0919  | -0.4098 | 2.4892  | -2.2896 | -0.7909 | -0.5389 |
| <b>27</b> | -1.5562 | -3.9032 | -0.2027 | 1.3998  | -0.29   | 0.6543  | -4.8841 | 0.382   | -1.0829 | -0.475  |

|           |         |         |         |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>28</b> | 1.2389  | -4.4448 | -1.8737 | 0.6145  | 0.7373  | -0.2552 | -0.5299 | 1.589   | -1.0639 | -0.614  |
| <b>29</b> | -0.4665 | -3.9286 | 1.3592  | 1.3446  | -0.4589 | -0.3743 | -3.5981 | 0.4499  | -0.7623 | -0.686  |
| <b>30</b> | -2.4832 | -3.4716 | -0.151  | -0.6805 | -0.7193 | -0.1067 | -4.682  | -2.7914 | 0.136   | -0.7307 |
| <b>31</b> | 0.9912  | 1.1662  | 4.1385  | 0.5456  | -0.0186 | -0.0278 | -5.619  | 3.0198  | 1.0629  | -0.5645 |
| <b>32</b> | -0.2754 | -2.4645 | -2.9877 | 2.2883  | -0.5472 | -0.0417 | -6.5866 | -2.4795 | 1.0629  | -0.6346 |
| <b>33</b> | -1.535  | -4.3856 | 3.57    | 2.4468  | -1.0143 | -2.8706 | -6.5988 | -3.2254 | 0.0059  | -0.7555 |
| <b>34</b> | -0.2117 | -4.1994 | -5.6177 | 2.9703  | -0.1748 | -1.0486 | 5.6124  | -1.7065 | -0.1655 | -0.7771 |
| <b>35</b> | 0.5313  | 1.9448  | 3.4092  | 0.5594  | 0.0729  | -0.8259 | 0.2356  | 4.0505  | -1.1306 | -0.4957 |
| <b>36</b> | -4.9032 | -4.5464 | 0.5668  | -1.8309 | -0.35   | -0.232  | -2.3488 | -2.7033 | -0.5465 | -0.4838 |
| <b>37</b> | -0.7566 | -4.4787 | -3.2461 | -2.9674 | -0.4526 | -0.7254 | 5.6246  | -3.6187 | -1.1306 | -0.4897 |
| <b>38</b> | -0.0631 | -4.5294 | -1.8393 | -1.3625 | 0.1928  | -0.1948 | -0.1809 | 3.6097  | -0.5941 | -0.6008 |
| <b>39</b> | 1.529   | -4.3348 | 4.5692  | -2.8297 | -0.0044 | 0.3527  | 0.7867  | -0.1943 | -0.4989 | -0.6609 |
| <b>40</b> | -3.7781 | -4.4956 | -2.0288 | 0.7316  | 0.2686  | -0.3402 | 2.5504  | -1.164  | -1.9242 | -0.7248 |
| <b>41</b> | -0.9901 | -4.5125 | -4.1994 | -1.4933 | -0.0802 | 0.7502  | 5.6369  | 1.0059  | -0.3052 | -0.5035 |
| <b>42</b> | -0.5302 | -3.7001 | -3.0566 | -1.1558 | -0.2553 | 0.0418  | 0.7316  | -0.3503 | 2.3168  | -0.5204 |
| <b>43</b> | 0.3897  | 0.7599  | 0.0672  | -2.01   | -0.4857 | 0.0232  | 3.812   | -0.2147 | 1.9676  | -0.6832 |
| <b>44</b> | 0.8992  | 3.8066  | 1.6923  | 0.518   | -1.2826 | -0.2985 | 5.6246  | 0.9449  | 0.4725  | -0.5977 |
| <b>45</b> | 0.0218  | -4.5041 | -2.4709 | 4.3066  | -0.3074 | -1.2373 | 5.6002  | -0.6758 | 1.0534  | -0.4687 |

| <b>Cos.</b> | <b>61</b> | <b>62</b> | <b>63</b> | <b>64</b> | <b>65</b> | <b>66</b> | <b>67</b> | <b>68</b> | <b>69</b> | <b>70</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | -0.0717   | 2.9809    | -6.799    | 1.4471    | -0.159    | -0.3624   | -0.4681   | 4.7764    | -0.3547   | 0.1184    |
| <b>-44</b>  | -0.3376   | 2.9659    | -2.468    | 0.512     | 0.487     | 0.7611    | -0.5371   | 4.7647    | -0.7106   | 2.5495    |
| <b>-43</b>  | 0.1993    | -2.2462   | 3.6922    | -0.1      | 0.1373    | -0.5602   | -0.6818   | 1.2794    | -0.461    | 1.0633    |
| <b>-42</b>  | 0.486     | 3.0186    | -3.8517   | -0.4025   | -0.7258   | -0.5037   | 0.0148    | 1.2794    | -0.2507   | -1.0111   |
| <b>-41</b>  | 1.0986    | 2.9885    | 2.1991    | -0.1435   | -1.0125   | -0.7722   | -0.0096   | 1.2794    | -0.3986   | 1.3011    |
| <b>-40</b>  | -1.0465   | 6.5737    | 3.2935    | 0.5234    | 0.1031    | 0.1887    | -0.9746   | 1.2794    | -0.6898   | 0.3875    |
| <b>-39</b>  | 0.8145    | -0.3783   | -1.1468   | 0.0123    | -0.975    | -0.1681   | -0.617    | 1.2794    | -0.6875   | 0.3655    |
| <b>-38</b>  | -1.4531   | -2.9316   | 0.8232    | -0.6271   | -0.5461   | 0.5844    | -0.437    | -3.3833   | -0.6667   | 0.8943    |
| <b>-37</b>  | 0.5069    | -3.5794   | -3.4843   | -0.3819   | -0.8745   | 0.2099    | -0.2266   | -3.3833   | -0.6228   | -0.8578   |
| <b>-36</b>  | -1.1638   | -0.3633   | 0.7919    | -0.0335   | -0.6018   | 1.1108    | -0.2914   | -3.3833   | -0.1098   | 0.231     |
| <b>-35</b>  | -1.3828   | 0.8644    | -2.0459   | -0.7601   | -0.7344   | -0.1822   | -0.2266   | -3.3717   | -0.4818   | 0.45      |
| <b>-34</b>  | 0.3297    | -4.3702   | 3.2466    | 0.2896    | -0.5633   | 0.588     | -0.2788   | -3.3833   | -0.4402   | -0.9986   |
| <b>-33</b>  | -0.8563   | -3.6246   | -3.8908   | 0.2965    | 0.5298    | 0.4219    | -0.4782   | -1.5066   | -0.2946   | -0.4417   |
| <b>-32</b>  | -1.4453   | -7.8274   | 3.7391    | -0.3177   | -0.974    | 0.3795    | -0.6212   | -3.3484   | -0.4194   | -0.4824   |
| <b>-31</b>  | -1.3906   | -3.6999   | 3.4108    | 0.0559    | -0.4092   | 0.0368    | -0.8374   | -2.9987   | -0.3986   | 1.1697    |
| <b>-30</b>  | -0.5565   | -8.1212   | -2.1631   | -1.1566   | -0.6895   | 0.1463    | -0.1484   | 1.2677    | -0.2507   | -0.7921   |
| <b>-29</b>  | -0.6634   | 0.646     | 3.4812    | 1.7015    | -0.2403   | 0.1993    | 0.6113    | -3.3833   | -0.3547   | -0.4761   |
| <b>-28</b>  | -1.4088   | -2.7208   | -3.1794   | -1.3102   | -0.5237   | -0.0268   | 0.0796    | -3.3717   | -0.6089   | -1.7402   |
| <b>-27</b>  | -1.4558   | -0.8302   | -3.9846   | -0.5676   | -0.1076   | -0.2882   | -0.3646   | -3.3717   | -0.119    | -1.0612   |
| <b>-26</b>  | 0.9943    | -3.3911   | -3.8048   | -0.1435   | -0.3633   | 0.0686    | -0.506    | -3.3833   | 1.457     | -0.6576   |
| <b>-25</b>  | 1.0516    | -7.9555   | 3.145     | -0.7234   | -0.1675   | 0.0828    | -0.4395   | -3.3833   | -0.461    | 1.7516    |
| <b>-24</b>  | -1.4036   | 4.1936    | -2.9136   | 0.065     | -0.775    | -1.2032   | -1.1723   | -3.3717   | -0.3686   | 1.1071    |
| <b>-23</b>  | -1.4505   | -6.2683   | 2.676     | -0.6936   | -0.774    | -0.1328   | -0.4218   | -3.3833   | -0.461    | -1.5493   |

|            |          |         |          |          |          |          |         |          |          |          |
|------------|----------|---------|----------|----------|----------|----------|---------|----------|----------|----------|
| <b>-22</b> | -1.0101  | -5.4774 | 2.7776   | 0.3767   | -0.0403  | 0.7258   | -0.3377 | -3.3833  | -0.3686  | -0.6419  |
| <b>-21</b> | -1.4505  | -5.0331 | -3.0153  | 1.4608   | 0.2934   | 0.6162   | -0.3562 | -3.3833  | -0.2253  | 2.0895   |
| <b>-20</b> | -1.4818  | -2.9015 | 3.2935   | 0.7366   | 0.2934   | -0.1257  | -0.0432 | -3.3717  | -0.6944  | 1.0508   |
| <b>-19</b> | -1.5027  | 6.8222  | -3.9377  | 1.0758   | 0.2934   | 1.1214   | 0.3043  | -3.3833  | -0.1052  | 2.0802   |
| <b>-18</b> | -1.4427  | 6.7092  | 3.2701   | -0.6203  | 0.2945   | -0.6592  | -1.6636 | -3.3833  | -0.5327  | -2.3784  |
| <b>-17</b> | -1.461   | 1.5348  | -2.085   | -0.1435  | 0.2945   | -0.1328  | -0.479  | -3.3833  | -0.6713  | 3.3943   |
| <b>-16</b> | 0.1941   | -3.0974 | -3.8283  | 0.6472   | 0.2945   | -0.5355  | -0.0491 | -3.3717  | -0.2484  | -2.3784  |
| <b>-15</b> | 1.049    | 2.3106  | -3.6641  | -0.194   | 0.2934   | 0.4749   | -0.5926 | -3.3134  | -0.3178  | -4.6875  |
| <b>-14</b> | 1.0204   | -1.6362 | 2.074    | -0.1435  | -0.3622  | 1.1108   | -0.1921 | 1.2677   | -0.4125  | -0.6388  |
| <b>-13</b> | 1.0803   | -1.8546 | -3.6094  | 0.567    | -0.774   | -0.3836  | -0.1316 | 1.2794   | -0.3178  | -0.7389  |
| <b>-12</b> | 1.0464   | -3.3685 | -3.4609  | -0.5928  | -0.774   | -0.8605  | 0.2092  | 1.2677   | -0.8377  | -1.4179  |
| <b>-11</b> | 1.0021   | 3.3349  | 0.2447   | -1.6769  | -0.774   | -0.055   | -0.4134 | 1.2794   | -0.3663  | 1.47     |
| <b>-10</b> | -1.4505  | -0.6419 | -0.9905  | 0.4776   | -0.775   | -0.5284  | -0.8972 | 1.2794   | -0.9463  | -2.3941  |
| <b>-9</b>  | -1.4818  | 3.1316  | -3.6876  | -1.0168  | -0.774   | 1.0049   | 0.1764  | 1.2794   | -0.4379  | -1.1645  |
| <b>-8</b>  | -1.4219  | -0.6419 | -0.1696  | 0.3011   | -0.774   | -1.2032  | -0.4353 | 1.2794   | -0.5304  | -1.1989  |
| <b>-7</b>  | -1.4453  | -4.4079 | 0.2212   | 0.0925   | -0.774   | -0.2281  | -0.4858 | 1.2794   | -0.5072  | -2.1626  |
| <b>-6</b>  | -1.3906  | 2.8755  | 2.2616   | -0.3544  | -0.6884  | -0.3659  | -0.251  | 1.2677   | 0.1305   | 2.1208   |
| <b>-5</b>  | 1.036    | -2.5023 | 3.6532   | 0.6059   | -0.6007  | 0.3901   | -0.4235 | 1.2677   | -1.1266  | -0.8422  |
| <b>-4</b>  | 1.0986   | -8.091  | 3.3874   | 0.5028   | -0.3953  | 0.3053   | -0.3663 | 1.2677   | -0.1814  | -1.396   |
| <b>-3</b>  | 0.6946   | -8.1287 | -3.1638  | -0.9366  | 0.2934   | 0.4431   | -0.4159 | 1.2794   | -2.7049  | -0.0662  |
| <b>-2</b>  | 0.7258   | -8.1513 | -3.8361  | -10.4964 | 0.2934   | -0.0939  | 0.2285  | 1.2794   | 0.4772   | -1.1864  |
| <b>-1</b>  | 0.7597   | -8.1663 | 0.6512   | -0.1435  | 0.2934   | -0.9736  | -0.6078 | 1.2794   | 2.7718   | -0.1038  |
| <b>0</b>   | -23.5766 | 33.3196 | -70.3404 | -0.1435  | -10.4864 | -26.9902 | -6.8732 | -115.241 | -18.9987 | -29.5649 |
| <b>1</b>   | 1.049    | -5.4021 | 3.5828   | -0.783   | -0.7707  | 0.0828   | 0.1326  | 1.2794   | -0.1814  | 0.6002   |
| <b>2</b>   | 1.0542   | -7.8425 | 3.5281   | -0.0404  | -0.344   | -0.1116  | -0.4353 | 1.2794   | 0.8261   | -3.7019  |

|           |         |          |         |         |         |         |         |         |         |         |
|-----------|---------|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>3</b>  | 1.0595  | -8.1663  | -1.9755 | -0.3727 | 0.2859  | 0.4113  | -0.2687 | 1.2794  | -0.4495 | -1.3772 |
| <b>4</b>  | 1.0595  | -5.1988  | -4.0394 | 0.6197  | -0.775  | 0.1428  | 0.4439  | 1.2794  | -0.4934 | -0.157  |
| <b>5</b>  | 1.0569  | -8.0082  | -0.3807 | -0.8563 | -0.7173 | 1.3652  | -0.1913 | 1.2794  | -0.022  | -0.4479 |
| <b>6</b>  | 1.0516  | -6.916   | -3.2576 | 0.3515  | -0.774  | 0.6021  | -0.2704 | 1.0113  | -0.7314 | -0.5293 |
| <b>7</b>  | -1.4636 | 1.5499   | 3.2701  | 0.0398  | 0.1244  | -0.5214 | -0.2022 | -3.3833 | -0.3224 | 0.012   |
| <b>8</b>  | -1.4062 | -10.8854 | -4.0472 | -0.1963 | -0.7248 | -0.2458 | 0.1242  | 1.2794  | 0.0566  | -0.0537 |
| <b>9</b>  | -1.461  | -15.5702 | -3.8674 | -0.5423 | -0.298  | 1.0437  | 0.0914  | 1.2794  | -0.5904 | -0.8046 |
| <b>10</b> | -1.3515 | -15.2162 | -2.4368 | -0.5103 | -0.2574 | -0.8959 | -0.1905 | 1.2794  | -0.5096 | -0.0318 |
| <b>11</b> | -1.5027 | -1.4403  | -3.9455 | -0.9732 | -0.4478 | -0.751  | -0.246  | 1.2794  | -0.297  | -0.0068 |
| <b>12</b> | 0.8197  | 3.8019   | 3.0121  | 0.0169  | -0.2381 | -0.3518 | -0.4395 | 1.2794  | -0.6551 | -0.7327 |
| <b>13</b> | -0.6816 | -7.1947  | -1.0921 | -1.0305 | -0.467  | 0.0086  | -0.1046 | 1.2794  | -0.4333 | 0.6002  |
| <b>14</b> | -1.4662 | -2.2312  | -4.0315 | -0.2604 | -0.2285 | -0.2705 | -0.0987 | 1.2794  | -0.6644 | -0.2102 |
| <b>15</b> | -1.4975 | 7.485    | -2.3898 | -0.2604 | -0.1825 | -0.6627 | -0.2014 | 1.2794  | -0.5188 | 1.1822  |
| <b>16</b> | -0.9944 | -1.3951  | -4.0628 | 0.3332  | -0.6413 | 0.4396  | -0.3343 | 1.2794  | -0.4079 | 0.1966  |
| <b>17</b> | -1.487  | -0.6419  | -4.0237 | -0.5882 | -0.3408 | 0.0545  | -0.002  | 1.2794  | -0.5673 | 0.134   |
| <b>18</b> | -1.5053 | 4.4195   | 1.2453  | 0.4822  | 0.0357  | 0.3124  | 0.1646  | 1.2794  | -0.7822 | 0.2748  |
| <b>19</b> | 1.0725  | 6.4833   | -0.6387 | -0.1435 | 0.0357  | -0.9241 | -0.1677 | 1.2794  | -0.2646 | -0.5449 |
| <b>20</b> | -1.1378 | 14.3843  | -1.2485 | -1.1978 | -0.4809 | -0.6203 | -0.4159 | 1.2794  | -0.4772 | 0.4563  |
| <b>21</b> | -1.4948 | -0.5892  | -3.9768 | 0.5418  | -0.528  | -1.0866 | -0.2207 | 1.2794  | -0.9278 | 0.1872  |
| <b>22</b> | 0.8874  | 0.3598   | -4.0628 | -0.8311 | -0.2638 | -0.5744 | -0.3469 | 1.2794  | -0.6505 | -0.3134 |
| <b>23</b> | 1.0751  | -10.5916 | -0.7247 | -0.8105 | -0.0884 | -0.1575 | -0.2165 | 1.2794  | -0.2531 | 0.1935  |
| <b>24</b> | 0.9474  | 0.2544   | 1.3782  | -0.2765 | 0.2945  | 0.1252  | -0.3242 | 1.2794  | 0.4448  | -0.6732 |
| <b>25</b> | -1.474  | -5.3569  | 1.8551  | 0.6816  | -0.1814 | -0.1751 | -0.6094 | 1.2794  | -0.8053 | -0.3228 |
| <b>26</b> | -1.4948 | 1.8436   | 3.6141  | -0.0519 | -0.1675 | -0.2387 | -0.0012 | -3.3833 | -0.6182 | -0.0537 |
| <b>27</b> | 0.7884  | -14.2747 | 3.6453  | -1.0397 | -0.6552 | 0.3654  | 0.2201  | -3.3833 | -0.3501 | 0.0714  |

|           |         |          |         |         |         |         |         |         |         |         |
|-----------|---------|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>28</b> | 0.5981  | 10.4601  | -0.9592 | 0.8008  | -0.6306 | -0.2635 | 0.0005  | -3.3833 | -0.3594 | 0.1684  |
| <b>29</b> | 0.6216  | -0.4687  | -3.3358 | 0.434   | 0.2945  | 0.1287  | 0.0291  | -3.3833 | -0.8885 | -0.2602 |
| <b>30</b> | 1.0986  | 4.7434   | -0.7716 | -0.9847 | -0.775  | -0.1504 | -0.9106 | -3.3833 | -0.1907 | 0.5783  |
| <b>31</b> | 1.0595  | -13.499  | -4.0159 | 0.1567  | -0.051  | -0.1363 | -0.9047 | -3.3833 | -0.5881 | -0.3197 |
| <b>32</b> | 1.0699  | -3.5869  | 1.2844  | 1.1835  | 0.2945  | 0.111   | -0.1375 | -3.3833 | -0.2115 | 0.3186  |
| <b>33</b> | 1.0881  | 2.4989   | 2.6838  | -0.6913 | 0.2945  | -0.0939 | -0.2451 | -3.3833 | -0.5766 | 0.1278  |
| <b>34</b> | 1.0933  | 5.1501   | 3.6141  | 0.8741  | 0.2945  | -0.6804 | -0.6061 | -3.3833 | -0.4194 | -0.2289 |
| <b>35</b> | 1.0986  | -1.4629  | 3.6297  | -0.7601 | -0.3183 | 0.164   | -0.3259 | -3.3833 | -0.7129 | -0.2477 |
| <b>36</b> | 1.0986  | -8.8216  | 3.6453  | -0.8243 | -0.2199 | -0.2175 | -0.3957 | -3.3833 | 0.1629  | -0.1976 |
| <b>37</b> | 1.096   | 1.8662   | 6.4049  | 1.0804  | -0.2873 | 0.1004  | 0.5255  | -3.3833 | -0.498  | 0.3311  |
| <b>38</b> | 0.705   | -0.77    | 5.9046  | 0.5578  | -0.1526 | 0.1605  | -0.177  | -3.3833 | -0.9093 | 0.353   |
| <b>39</b> | 1.0907  | 3.9601   | 5.0134  | -1.4064 | -0.1739 | 0.0086  | 0.0603  | -3.3833 | -0.4864 | 0.8411  |
| <b>40</b> | -1.3854 | -14.9752 | -0.8107 | 1.1927  | -0.4392 | -0.6238 | -0.3503 | -3.3717 | -0.0821 | 0.0558  |
| <b>41</b> | -1.229  | 9.8275   | 1.3626  | -0.1435 | 0.0175  | 0.1923  | 0.0283  | -3.3833 | -0.3478 | 0.3749  |
| <b>42</b> | 2.3757  | -4.9276  | -0.3885 | -0.6294 | -0.037  | 0.4643  | -0.2822 | -3.36   | -0.1283 | -0.5293 |
| <b>43</b> | 0.5747  | -6.5771  | -0.3885 | -1.8717 | -0.36   | 0.0227  | -0.2628 | -3.3833 | -0.4287 | 0.7911  |
| <b>44</b> | 2.3236  | -15.7058 | -1.0296 | -2.2842 | -0.4253 | 0.1499  | -0.2493 | -3.2668 | -0.6135 | -0.7045 |
| <b>45</b> | -0.3376 | 12.313   | 0.6981  | -0.4117 | -0.1996 | 0.7575  | -0.198  | -3.1618 | -0.6066 | 0.3906  |

| <b>Cos.</b> | <b>71</b> | <b>72</b> | <b>73</b> | <b>74</b> | <b>75</b> | <b>76</b> | <b>77</b> | <b>78</b> | <b>79</b> | <b>80</b> |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>WP</b>   | <b>AR</b> |
| <b>-45</b>  | -2.5997   | 4.9186    | 1.7265    | -0.6035   | -1.3286   | 3.2076    | -2.1735   | 0.9396    | -0.0649   | 0.3252    |
| <b>-44</b>  | 1.2779    | 3.483     | -1.8152   | 0.2901    | -0.2966   | 3.3498    | 1.9207    | 1.147     | -1.4938   | -1.5941   |
| <b>-43</b>  | 0.4351    | 3.5956    | -1.2213   | -0.2065   | 0.1042    | -0.2885   | -0.077    | -0.2014   | -0.2544   | -0.4613   |
| <b>-42</b>  | -0.091    | 3.7176    | -1.8152   | 0.2581    | -1.4884   | 4.4474    | -0.9646   | -0.3103   | -0.948    | -2.1634   |
| <b>-41</b>  | -2.0931   | 3.8396    | -2.5961   | 0.1846    | -1.4989   | 4.4474    | -1.0597   | 0.3743    | -1.4104   | 1.9862    |
| <b>-40</b>  | -2.629    | 2.1037    | 0.3846    | -0.1543   | -1.3836   | -5.0042   | 0.2937    | 0.1098    | -0.5084   | -0.25     |
| <b>-39</b>  | -2.4049   | -3.1696   | -0.3963   | 0.5461    | -0.7497   | -5.431    | -0.4248   | -0.2429   | -0.1293   | -1.1891   |
| <b>-38</b>  | -1.9324   | -3.0476   | 1.7485    | -0.3404   | 0.56      | -5.4005   | -0.2956   | 2.2828    | -0.8608   | -0.3556   |
| <b>-37</b>  | 0.0649    | -2.935    | 1.6385    | 1.2856    | -1.1662   | 3.3092    | -0.7327   | -0.8445   | -1.8691   | -1.7349   |
| <b>-36</b>  | 1.765     | -4.3143   | 2.9144    | -0.0192   | 0.8848    | -5.5327   | -0.478    | 1.8679    | -0.2961   | 0.2606    |
| <b>-35</b>  | 1.9306    | -4.0985   | -1.1333   | -0.9709   | -0.7969   | 2.8214    | -0.6206   | -0.7252   | 0.6249    | -0.5669   |
| <b>-34</b>  | -0.4612   | -3.9015   | 2.1775    | -0.1306   | 1.1074    | 3.8275    | -0.3849   | -0.6682   | 2.1714    | -0.9719   |
| <b>-33</b>  | -1.908    | -3.7232   | 2.3315    | -0.485    | -1.4805   | -5.4514   | 0.7004    | -1.4513   | 0.534     | -1.3182   |
| <b>-32</b>  | -2.6144   | 4.5058    | 2.7604    | 0.1195    | 1.1048    | 4.4678    | 1.4246    | 0.6025    | -0.3946   | 0.8241    |
| <b>-31</b>  | -0.9776   | -1.0772   | -5.9729   | 0.5485    | -1.0641   | 4.4881    | 0.3488    | -0.7511   | 1.148     | -1.0247   |
| <b>-30</b>  | -2.0152   | -3.6669   | 2.2435    | 1.2299    | 1.1101    | -4.8416   | -0.594    | 0.6025    | -0.9746   | -0.0504   |
| <b>-29</b>  | 0.2938    | -3.498    | 2.6724    | 0.699     | -0.5847   | 2.4047    | -0.8335   | -0.3881   | -1.5431   | -0.9719   |
| <b>-28</b>  | 1.385     | 1.5876    | 2.2875    | 0.1965    | -0.0163   | 2.0185    | -0.7765   | 0.2135    | 0.8978    | -0.7195   |
| <b>-27</b>  | 0.5423    | -3.4042   | 0.1316    | 0.3541    | -1.2107   | 4.5389    | -0.9646   | -1.0208   | -2.2405   | -1.0658   |
| <b>-26</b>  | 0.1331    | -3.2634   | 1.0446    | -0.7137   | -0.5821   | -5.3091   | -0.345    | -1.2231   | 2.2282    | -0.7665   |
| <b>-25</b>  | 0.5277    | -2.0155   | 3.5744    | 0.283     | -0.197    | -5.2989   | -0.9589   | -0.9223   | -0.2544   | -1.9814   |
| <b>-24</b>  | -2.0054   | 3.9146    | 3.5304    | 0.1645    | -1.4727   | -5.4818   | -0.4799   | 0.3068    | -0.0156   | -0.3204   |
| <b>-23</b>  | 1.1366    | 4.0554    | -3.674    | 0.0033    | -0.9619   | -1.9349   | -0.7365   | 0.4261    | -3.4155   | -1.4767   |

|            |         |          |           |         |         |          |          |          |          |          |
|------------|---------|----------|-----------|---------|---------|----------|----------|----------|----------|----------|
| <b>-22</b> | 1.6042  | 4.2149   | -0.5613   | 0.3032  | -0.7759 | -5.553   | -0.7841  | -0.3777  | -0.6107  | 0.02     |
| <b>-21</b> | 1.7796  | 4.3838   | 2.3975    | 0.2249  | -0.514  | -5.492   | -0.6054  | -0.8601  | 0.7462   | -1.1421  |
| <b>-20</b> | 0.9466  | 4.5715   | 0.5056    | 0.3482  | 1.1127  | -4.0692  | -0.516   | -0.3103  | -1.9411  | -0.5141  |
| <b>-19</b> | 0.0357  | 4.7685   | 3.0244    | 0.1882  | -1.1007 | -0.502   | -0.6206  | 0.3276   | -0.569   | -1.3241  |
| <b>-18</b> | 0.0308  | 4.9937   | -0.7703   | -0.978  | -0.5664 | 0.2196   | -0.5389  | -1.4461  | 1.7848   | -1.4062  |
| <b>-17</b> | 1.1366  | 3.5393   | -1.1113   | -0.5205 | -0.7445 | -5.4514  | -0.2233  | -0.2429  | 1.0343   | 4.2987   |
| <b>-16</b> | -1.4063 | 3.6519   | 2.1885    | 0.0472  | 1.1101  | 3.0348   | -0.2442  | -0.4089  | -1.816   | -0.9191  |
| <b>-15</b> | 1.7991  | 3.7739   | 3.1344    | 0.3363  | 1.1074  | 4.3153   | -0.689   | -0.2844  | 1.1442   | 1.5695   |
| <b>-14</b> | 0.7469  | 3.9146   | 0.1206    | -0.1164 | -1.1243 | 4.5491   | -0.1378  | 0.0994   | -0.1142  | 0.0669   |
| <b>-13</b> | -0.32   | 4.0554   | 0.1536    | 0.3221  | -1.0562 | 4.3865   | -0.5997  | 0.2342   | -0.9291  | -3.977   |
| <b>-12</b> | 0.3474  | 4.2149   | 2.6944    | 0.3991  | -1.4884 | -2.3008  | -0.2556  | 2.039    | -0.6372  | -0.9543  |
| <b>-11</b> | 0.2354  | 4.3838   | 1.5725    | 0.27    | -1.5041 | 4.3153   | -1.0369  | -0.7304  | -1.1982  | -0.8545  |
| <b>-10</b> | -1.7473 | 4.5715   | 0.3406    | -0.5063 | 1.1022  | 2.7401   | -0.8335  | -1.3683  | 1.1215   | -2.3571  |
| <b>-9</b>  | 2.1742  | 4.7685   | 2.2105    | -0.4862 | 1.1022  | 4.2543   | 0.0371   | -0.1132  | 1.7203   | -0.9367  |
| <b>-8</b>  | 2.2132  | 4.9937   | 0.9346    | 0.3707  | 1.0996  | 4.234    | 0.3317   | -0.7356  | -1.5203  | -0.0387  |
| <b>-7</b>  | -2.6387 | 2.7042   | 0.5276    | 0.8128  | -1.5067 | 4.4678   | -0.7289  | 0.1253   | 0.1815   | -3.3959  |
| <b>-6</b>  | -2.59   | 2.7699   | 3.5854    | -1.0444 | -1.4203 | 4.4474   | -1.1186  | -0.1132  | -0.8987  | -5.3445  |
| <b>-5</b>  | -2.5851 | 2.8356   | -0.3193   | 0.8459  | -1.4989 | 4.417    | -0.7803  | -0.0458  | -1.3725  | 2.1212   |
| <b>-4</b>  | -2.3805 | 2.9107   | 2.8594    | -0.082  | -1.4989 | 4.3661   | -1.0939  | -0.1547  | -0.6903  | -4.2705  |
| <b>-3</b>  | 0.6446  | 2.9857   | 3.0574    | 1.0688  | 1.1127  | -4.618   | -1.5139  | -0.3051  | -0.8912  | -2.3512  |
| <b>-2</b>  | 2.1157  | 3.0608   | 3.2884    | -0.9436 | 1.1048  | -4.4655  | -0.6282  | -0.2636  | 0.0412   | -0.3967  |
| <b>-1</b>  | 1.2048  | 3.1452   | 3.5304    | 0.712   | 1.1074  | -4.3131  | -0.1511  | -0.3259  | 0.2724   | -1.9697  |
| <b>0</b>   | -1.7229 | -84.1174 | -100.3671 | 9.5579  | -25.841 | -91.9286 | -15.0853 | -46.7165 | -34.1658 | -52.0817 |
| <b>1</b>   | 2.5395  | 8.3528   | 2.8924    | 0.4714  | 1.1127  | -5.3599  | -0.3811  | -0.3674  | 1.3072   | 0.6363   |
| <b>2</b>   | -2.21   | 9.1129   | -1.4302   | 0.0555  | 1.1127  | 4.3357   | -0.3602  | 0.7892   | -0.5463  | -0.743   |

|           |         |         |         |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>3</b>  | -5.05   | -0.0356 | 2.8374  | 0.3351  | 1.1127  | -5.4615 | -0.5294 | -0.0303 | 2.141   | -1.7232 |
| <b>4</b>  | -0.3346 | 9.5726  | -1.5402 | 0.4762  | -1.4255 | 2.7401  | -0.0219 | -0.746  | -0.1142 | 0.1609  |
| <b>5</b>  | 2.1303  | 2.5822  | -4.136  | -0.0536 | -0.5166 | 4.3357  | 0.0143  | 0.3328  | 0.5415  | 0.8769  |
| <b>6</b>  | 1.8624  | 3.042   | 3.5964  | 0.4501  | 1.1127  | -0.502  | -0.1093 | -0.3155 | 1.4891  | -1.911  |
| <b>7</b>  | -0.7291 | -4.1642 | 3.1894  | 0.1467  | 1.1127  | -5.4818 | 0.1093  | 2.2465  | 1.057   | 4.375   |
| <b>8</b>  | -5.0598 | 0.3022  | -2.4641 | 0.1763  | 0.9607  | -3.2866 | -0.3469 | -0.6993 | -1.2285 | -1.1891 |
| <b>9</b>  | 3.3969  | 4.9937  | -1.7382 | -0.5608 | 1.1127  | -3.6627 | -0.4191 | 0.9188  | -1.7326 | -0.5611 |
| <b>10</b> | 2.5249  | 1.0903  | -0.1983 | -0.8073 | 1.1127  | 4.5389  | -0.4286 | -0.0873 | 0.5946  | 0.8065  |
| <b>11</b> | 4.527   | -4.2017 | -0.5503 | -0.165  | 1.1127  | 4.5389  | -0.4856 | 0.2861  | 0.1625  | 0.7419  |
| <b>12</b> | -1.1822 | 0.3022  | -1.8922 | -0.2953 | 1.1127  | -5.5327 | -0.7194 | 0.2394  | -1.1716 | -3.7011 |
| <b>13</b> | -5.0695 | -3.3103 | -2.7721 | -0.0595 | 1.1127  | -5.5225 | 0.3108  | 1.4374  | -0.1672 | -1.1891 |
| <b>14</b> | -5.0549 | -3.8358 | -2.0352 | -0.0891 | -1.1217 | -1.4268 | -0.7384 | 0.6491  | 0.1966  | -1.6821 |
| <b>15</b> | -5.0598 | -4.2955 | -1.4522 | -0.2183 | 0.154   | 1.7441  | -0.5598 | -0.6941 | -0.804  | -0.2735 |
| <b>16</b> | 0.6007  | -4.0797 | -2.0352 | 0.2107  | 0.4133  | 1.9168  | 0.421   | -0.4348 | 0.985   | -1.6058 |
| <b>17</b> | -0.9581 | 0.3022  | -2.6181 | -0.2705 | 0.1094  | 0.4737  | -1.1319 | -0.8652 | 0.227   | 0.0728  |
| <b>18</b> | -0.1397 | 4.8999  | 2.2655  | 0.1218  | 1.1127  | -5.492  | -0.4723 | -0.134  | 0.5036  | -1.4473 |
| <b>19</b> | 3.5041  | -4.0797 | -2.3432 | -0.5016 | 1.1127  | -5.4717 | -0.9247 | 0.8151  | -0.1445 | 5.3552  |
| <b>20</b> | -0.7145 | 0.3022  | 2.9694  | 0.3778  | 1.1127  | -4.7399 | -0.4913 | -0.1858 | -0.3378 | -0.5141 |
| <b>21</b> | 0.0454  | -1.5369 | 0.0986  | -0.3001 | 1.1127  | 1.3274  | -0.3222 | -0.803  | 1.4626  | -1.236  |
| <b>22</b> | 0.6007  | 4.7967  | -0.3633 | -0.1745 | 0.1723  | 9.5696  | -0.4837 | 1.0588  | 0.4203  | 0.1315  |
| <b>23</b> | -2.2149 | 4.6747  | -1.6502 | 0.7535  | 0.243   | 6.8662  | -0.5199 | 2.5369  | -0.2999 | -0.3674 |
| <b>24</b> | -5.05   | 4.8905  | -2.0572 | 0.0827  | -1.1714 | -5.2278 | -0.478  | -1.2698 | -0.9253 | -0.6785 |
| <b>25</b> | -1.377  | 4.731   | 0.0766  | 0.2474  | -0.5716 | -2.9817 | 0.1929  | -1.4409 | -1.1489 | -1.688  |
| <b>26</b> | 0.7225  | 4.9562  | -1.6502 | 0.1906  | -0.5926 | 1.9168  | -0.6871 | -0.7719 | -0.9101 | 0.5952  |
| <b>27</b> | -1.1578 | 4.7685  | -1.4852 | -0.306  | 0.4788  | 1.9778  | -0.3089 | -1.4617 | 2.9484  | -0.6139 |

|           |         |         |         |         |         |          |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|----------|---------|---------|---------|---------|
| <b>28</b> | -0.9484 | 4.9937  | -1.1553 | -0.37   | 1.1127  | -5.2278  | -0.5389 | -0.5022 | 0.3558  | -1.2771 |
| <b>29</b> | 1.8478  | 4.7685  | -5.1919 | 0.0246  | 1.1127  | 2.2929   | -0.3792 | 0.0994  | -0.2317 | 1.5284  |
| <b>30</b> | -4.3632 | 4.9937  | -0.1763 | -0.325  | 1.1127  | 9.4985   | -0.4039 | -0.8082 | -0.3833 | 0.0259  |
| <b>31</b> | 0.6251  | -4.1642 | 3.6733  | -0.0678 | -1.4989 | -5.3294  | -0.2252 | 0.3172  | -0.7054 | 0.4954  |
| <b>32</b> | -0.8996 | 4.9937  | -2.1562 | -0.0204 | -1.1976 | -0.756   | -0.2195 | 1.5827  | -0.6296 | -1.9814 |
| <b>33</b> | -2.0395 | 4.7216  | 2.0785  | 0.11    | 1.1074  | 9.5188   | 1.8086  | 1.4219  | -0.2165 | -1.4708 |
| <b>34</b> | 2.9195  | 4.9468  | 0.6266  | -0.5122 | 1.1127  | -0.502   | -0.9893 | 0.2187  | -0.4363 | -0.2324 |
| <b>35</b> | 1.3753  | 4.6184  | -2.8931 | 0.1835  | 1.1127  | -9.3946  | -0.689  | -0.0147 | 0.462   | -2.2397 |
| <b>36</b> | 0.9856  | 4.8248  | -1.2762 | 0.3612  | 1.1127  | 9.092    | -0.1188 | -0.3829 | -0.4325 | 0.4132  |
| <b>37</b> | -1.4306 | -3.498  | -0.4513 | 0.1633  | 1.1127  | -10.4109 | -0.1055 | 0.3483  | -0.895  | -0.9778 |
| <b>38</b> | 0.781   | 0.3022  | -0.1433 | -0.4897 | 1.1127  | 4.6405   | -0.6377 | -0.3777 | -0.3378 | 2.7668  |
| <b>39</b> | -0.5635 | -4.3425 | -2.9151 | -0.1946 | 1.0839  | 9.6509   | -0.0523 | -0.217  | 0.6894  | -0.4026 |
| <b>40</b> | 0.4936  | -4.1173 | -1.4522 | 0.488   | 1.1127  | -3.3171  | 0.096   | 0.5973  | -0.5046 | -0.6608 |
| <b>41</b> | 0.6202  | -3.9202 | -1.0783 | 0.7239  | 1.1127  | -10.543  | -1.3847 | -1.4617 | -0.8192 | 0.1315  |
| <b>42</b> | 1.7114  | 0.3022  | 0.3516  | 0.3292  | 1.1127  | -0.878   | -0.7898 | -0.5644 | -1.0579 | -0.9308 |
| <b>43</b> | -0.4076 | 1.2499  | 2.3975  | -0.1839 | 1.1127  | -0.1259  | -0.2214 | 1.3596  | -1.2664 | 0.0846  |
| <b>44</b> | 0.703   | -4.2111 | 0.5936  | -0.2065 | -0.1027 | -4.1708  | -1.3714 | 0.6699  | 0.9282  | -1.0306 |
| <b>45</b> | -1.9665 | -4.0047 | -2.4092 | -0.1911 | 0.5443  | 2.9128   | -0.8867 | -1.5758 | 0.6553  | -0.1443 |

| <b>Cos.</b> | <b>81</b> | <b>82</b> | <b>83</b> | <b>84</b> | <b>85</b> | <b>86</b> |             |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| <b>WP</b>   | <b>AR</b> | <b>AR</b> | <b>AR</b> | <b>AR</b> | <b>AR</b> | <b>AR</b> | <b>ARRs</b> |
| <b>-45</b>  | -0.3484   | 5.5253    | 0.598     | -0.598    | -3.5332   | -2.744    | -0.2716     |
| <b>-44</b>  | -0.5042   | 3.8363    | 0.399     | -0.2494   | 1.8575    | -0.0991   | 0.178       |
| <b>-43</b>  | -0.7507   | 0.266     | -0.2646   | -0.278    | 1.7437    | 2.3324    | 0.144       |
| <b>-42</b>  | -0.9382   | -0.4823   | -4.8502   | -0.4327   | 1.6419    | -3.8492   | -0.1307     |
| <b>-41</b>  | -0.5299   | -0.5587   | -2.2219   | 0.4372    | 1.546     | 3.5291    | -0.239      |
| <b>-40</b>  | 0.3987    | -0.2105   | 5.5191    | 0.5866    | -3.1978   | -3.8415   | -0.4423     |
| <b>-39</b>  | -0.5344   | 2.41      | -4.3857   | -0.1063   | 2.1031    | -3.6662   | -0.6168     |
| <b>-38</b>  | -0.6055   | 0.9654    | -0.847    | -0.0862   | -0.2089   | 2.4543    | -0.686      |
| <b>-37</b>  | -0.238    | -0.1036   | -0.5631   | -0.4475   | -2.5389   | 2.5382    | -0.5636     |
| <b>-36</b>  | 0.0902    | -0.8396   | -1.0202   | -0.4518   | 2.0192    | -2.9193   | -0.1777     |
| <b>-35</b>  | 0.1522    | -1.1481   | -0.095    | -0.225    | -3.102    | -2.8202   | -0.2994     |
| <b>-34</b>  | -1.035    | -0.7205   | 0.6754    | -0.5736   | 1.9953    | 2.4315    | 0.1215      |
| <b>-33</b>  | -1.333    | 1.506     | -1.0313   | -0.5948   | -3.084    | -1.2043   | -0.428      |
| <b>-32</b>  | 0.3292    | -0.1616   | 0.2921    | -0.3511   | 1.9713    | 0.4573    | 0.0648      |
| <b>-31</b>  | -0.4376   | -0.8457   | -0.471    | -0.3575   | 1.8515    | -0.0991   | -0.0483     |
| <b>-30</b>  | -0.4376   | 0.8982    | -0.847    | -0.1604   | -3.5272   | -0.3735   | -0.3947     |
| <b>-29</b>  | -1.0789   | -0.3693   | -0.6553   | -0.1456   | -3.06     | -3.8034   | -0.2996     |
| <b>-28</b>  | -0.4316   | 0.1499    | 0.3879    | -0.1032   | -3.7728   | 2.6449    | -0.3273     |
| <b>-27</b>  | -1.2347   | 1.0356    | 0.7049    | 0.5866    | -0.778    | 3.0412    | -1.1511     |
| <b>-26</b>  | -0.3832   | -0.8854   | -2.2367   | 0.5866    | 2.0731    | 1.654     | -0.388      |
| <b>-25</b>  | -0.8914   | 1.4938    | -0.6516   | -1.1087   | -0.778    | 2.622     | -0.4245     |
| <b>-24</b>  | -0.5858   | -1.0015   | -1.1898   | -1.1087   | 0.3421    | -3.0107   | -0.3998     |
| <b>-23</b>  | -0.4528   | -0.5709   | -0.9981   | -0.3861   | 1.8934    | -3.1708   | -0.1067     |

|            |          |          |          |         |         |          |          |
|------------|----------|----------|----------|---------|---------|----------|----------|
| <b>-22</b> | -0.1941  | 0.5592   | -2.7822  | -0.3384 | 1.7796  | -0.9299  | -0.1374  |
| <b>-21</b> | -0.8626  | -1.8506  | -0.1245  | 0.4097  | 2.145   | -2.7668  | -0.2638  |
| <b>-20</b> | -0.6751  | 0.7241   | -4.3305  | -1.1087 | -0.778  | -0.8918  | -0.4931  |
| <b>-19</b> | -0.3681  | 0.5806   | 1.3426   | -0.0343 | -3.3176 | 0.968    | -0.229   |
| <b>-18</b> | -0.2471  | 0.8005   | -2.1593  | -0.67   | 2.121   | -0.0991  | -0.3496  |
| <b>-17</b> | -0.6297  | -0.5556  | -1.5953  | -0.6584 | -1.2631 | -2.1799  | -0.0679  |
| <b>-16</b> | -0.5178  | 0.4431   | 2.6586   | 0.2529  | -3.3176 | -1.1281  | -0.0627  |
| <b>-15</b> | -0.1382  | -0.632   | 0.5833   | -0.4157 | 2.121   | 0.4192   | 0.0952   |
| <b>-14</b> | -0.8808  | -0.0211  | 1.8218   | -0.8534 | 1.546   | 1.7531   | 0.0692   |
| <b>-13</b> | -0.5556  | -0.4456  | -0.7106  | -0.5609 | 1.8815  | -2.904   | -0.138   |
| <b>-12</b> | -0.6312  | -1.3314  | -1.669   | -0.0258 | -3.5632 | -1.6006  | -0.4356  |
| <b>-11</b> | -0.4966  | 1.0051   | -0.7733  | -0.4391 | -3.1918 | -0.3506  | -0.4483  |
| <b>-10</b> | -0.3575  | 0.6936   | -1.4626  | -0.6944 | -2.2634 | 1.1662   | -0.4706  |
| <b>-9</b>  | -0.8324  | -0.8427  | -0.9871  | -0.1795 | 0.6715  | -1.8293  | -0.3161  |
| <b>-8</b>  | -0.0172  | 0.5195   | -1.6285  | 0.3387  | -2.7725 | -1.7912  | -0.4852  |
| <b>-7</b>  | -0.7537  | -0.974   | -1.927   | -0.1138 | -2.3113 | 0.8842   | -1.1361  |
| <b>-6</b>  | -0.6872  | -0.3296  | 1.0182   | 0.5273  | -3.4494 | 1.4025   | -0.4925  |
| <b>-5</b>  | -0.908   | -0.2777  | -3.5858  | -0.4454 | -3.5751 | -3.6739  | -0.2616  |
| <b>-4</b>  | -0.607   | -0.1372  | 0.727    | -0.8152 | -3.7129 | -3.0717  | -0.7414  |
| <b>-3</b>  | -0.6342  | 0.2232   | -2.0192  | -0.4677 | -3.2218 | -3.8034  | -0.375   |
| <b>-2</b>  | -0.5571  | -1.933   | -2.5426  | -0.4942 | -3.3296 | -2.218   | -1.4545  |
| <b>-1</b>  | -0.5571  | -0.8335  | -1.8607  | -0.5683 | -3.4374 | 3.2166   | -0.1476  |
| <b>0</b>   | -12.3025 | -27.3592 | -33.5584 | -0.2621 | 52.8956 | -68.4086 | -30.1267 |
| <b>1</b>   | -0.5737  | 0.8615   | -1.5252  | 0.5866  | -3.7548 | 3.6281   | -0.1669  |
| <b>2</b>   | -0.3575  | -1.7437  | 1.8181   | 0.5866  | -3.3535 | -3.872   | -0.1904  |

|           |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|
| <b>3</b>  | -0.3151 | -0.6564 | 0.1815  | -8.5682 | 0.0426  | -3.3766 | -0.497  |
| <b>4</b>  | -0.4013 | -0.0425 | -1.3962 | 0.4499  | 0.6057  | 3.6891  | 0.1785  |
| <b>5</b>  | -0.5178 | 0.8554  | 1.7887  | 0.2793  | 1.2645  | 3.6358  | 0.2807  |
| <b>6</b>  | -0.3045 | 0.1957  | 0.4063  | -0.0894 | 2.169   | 3.6967  | 0.4317  |
| <b>7</b>  | -0.356  | 1.1089  | 0.1852  | -0.1911 | 2.2109  | 3.6129  | 0.0115  |
| <b>8</b>  | -0.3257 | -0.6258 | -0.0102 | 0.1691  | 2.1869  | 3.6586  | -0.286  |
| <b>9</b>  | -0.4013 | -0.6778 | -1.3483 | -0.5747 | 1.3783  | 3.6967  | -0.1738 |
| <b>10</b> | -0.5102 | -0.9618 | -0.213  | -0.2727 | 2.163   | 3.5748  | -0.2756 |
| <b>11</b> | -0.3817 | -0.0761 | -0.0139 | -0.5863 | 0.7853  | 3.59    | -0.4028 |
| <b>12</b> | -0.4785 | -0.8183 | -0.67   | -0.1932 | 2.1989  | 3.6053  | -0.2219 |
| <b>13</b> | -0.4618 | 0.8402  | -0.7622 | -0.6022 | 1.1088  | 3.6053  | -1.075  |
| <b>14</b> | -0.4255 | -0.6717 | 0.281   | -0.1625 | -0.2868 | 3.5977  | -0.2072 |
| <b>15</b> | -0.4845 | -0.0242 | -1.4589 | -0.4126 | 2.175   | 3.5824  | 0.0188  |
| <b>16</b> | -0.7371 | -1.7162 | 0.9113  | -0.4444 | -2.0238 | 3.5595  | -0.019  |
| <b>17</b> | -0.3726 | 0.2141  | 0.093   | -0.2653 | 2.133   | 3.5214  | 0.2852  |
| <b>18</b> | -0.5087 | -0.0303 | 1.4495  | -0.2123 | 2.2049  | 3.7044  | 0.0779  |
| <b>19</b> | -0.5344 | 0.2538  | -2.1482 | -0.2886 | 2.1031  | 3.651   | 0.3241  |
| <b>20</b> | -0.3802 | 0.9898  | -0.6737 | -0.1604 | 2.157   | 3.59    | -0.0228 |
| <b>21</b> | -0.6146 | -0.1647 | -0.6074 | -0.0131 | -0.9756 | 2.1799  | 0.0814  |
| <b>22</b> | -0.4724 | -0.4548 | -0.7327 | -0.1403 | 2.0312  | 0.4116  | 0.1393  |
| <b>23</b> | -0.3091 | 0.3759  | -0.5042 | -0.2918 | -0.778  | -0.0991 | -0.0692 |
| <b>24</b> | -0.0081 | 0.1713  | 0.3547  | -0.1879 | 2.0731  | -1.6006 | -0.4485 |
| <b>25</b> | -0.2834 | -0.296  | -0.2093 | -0.3808 | 2.1091  | 0.6555  | -0.412  |
| <b>26</b> | 0.1265  | 0.9807  | -0.7696 | -0.3077 | 1.8216  | -0.846  | -0.0556 |
| <b>27</b> | -0.6297 | -0.4456 | -0.67   | 0.1172  | 0.9531  | -1.3262 | -0.2007 |

|           |         |         |         |         |         |         |         |
|-----------|---------|---------|---------|---------|---------|---------|---------|
| <b>28</b> | -0.542  | 1.5243  | -0.5373 | -0.2971 | 0.0007  | -0.8308 | 0.0909  |
| <b>29</b> | -0.542  | -0.1921 | 0.6975  | 0.1893  | -4.9348 | -0.343  | 0.0457  |
| <b>30</b> | -0.601  | 0.4767  | 0.1335  | -0.829  | -1.4488 | 3.4605  | -0.3805 |
| <b>31</b> | -0.7462 | -0.8488 | -2.4284 | -0.1805 | 1.3304  | -2.7973 | -0.6455 |
| <b>32</b> | -0.5889 | 0.4309  | 0.0783  | -0.0502 | -1.2691 | -3.6053 | -0.4278 |
| <b>33</b> | -0.4981 | 0.6844  | 1.1104  | -0.9604 | -2.9822 | -3.8797 | -0.158  |
| <b>34</b> | 0.0978  | 0.2446  | -0.036  | -0.2165 | 1.6658  | -2.8812 | 0.217   |
| <b>35</b> | -0.3318 | -0.1708 | 0.0377  | -0.1116 | 0.0247  | -2.9802 | 0.027   |
| <b>36</b> | -0.3665 | 0.6936  | -0.2719 | -0.5853 | 0.3241  | -3.8187 | -0.3931 |
| <b>37</b> | -0.1155 | 0.0064  | 0.6533  | 0.0494  | -1.4129 | 1.9132  | -0.5413 |
| <b>38</b> | -0.9322 | 0.0888  | -0.5521 | -0.2112 | 0.1624  | -0.7012 | 0.0079  |
| <b>39</b> | -0.2864 | -0.1891 | -0.8617 | -0.1074 | 1.1926  | 3.4528  | -0.1164 |
| <b>40</b> | -0.9322 | 0.3301  | 1.8439  | -0.3776 | 0.6715  | 3.3919  | -0.4982 |
| <b>41</b> | -0.6857 | 0.3332  | -0.0397 | 0.1797  | -0.8079 | 3.369   | 0.1204  |
| <b>42</b> | -0.5011 | 0.4798  | -0.412  | 0.5781  | -6.7377 | -3.872  | -0.5161 |
| <b>43</b> | -0.6206 | 0.2324  | -1.1787 | -0.2716 | -6.7557 | -3.1784 | -0.3661 |
| <b>44</b> | -0.2229 | 0.1438  | -0.154  | 0.1448  | 0.6536  | -3.4833 | -0.3189 |
| <b>45</b> | 0.0509  | -0.0242 | -0.1908 | -0.3183 | 1.2166  | 2.965   | 0.4168  |

## Appendix – C

### Earnings per Share of 71 Sample Buyback Companies

| <b>Sr. No.</b> | <b>Name of the Company</b>          | <b>AVEPS BABB</b> | <b>EPSTY BABB</b> | <b>EPSOY BABB</b> | <b>EPS in the YABB</b> | <b>EPSOY AABB</b> | <b>EPSTY AABB</b> | <b>AVEPS AABB</b> |
|----------------|-------------------------------------|-------------------|-------------------|-------------------|------------------------|-------------------|-------------------|-------------------|
| 1              | <b>Addi Industries Ltd.</b>         | 5.18              | 2.49              | 7.86              | 10.01                  | 1.99              | 0.11              | 1.05              |
| 2              | <b>Alembic Ltd.</b>                 | 6.61              | 5.11              | 8.1               | 0.53                   | 1.55              | -0.97             | 0.29              |
| 3              | <b>Allcargo Logistics Ltd.</b>      | 11.69             | 9.28              | 14.1              | 9.14                   | 4.45              | 7.7               | 6.08              |
| 4              | <b>Allied Digital Services Ltd.</b> | 20.36             | 22.32             | 18.4              | 2.63                   | -2.2              | 2.77              | 0.29              |
| 5              | <b>Amtek Automobile Ltd.</b>        | 5.3               | 7.09              | 3.51              | 13.22                  | 16.49             | 14.68             | 15.59             |
| 6              | <b>Balrampur Chini Mills Ltd.</b>   | 2.4               | 3.71              | 1.09              | 6.41                   | 0.27              | 6.63              | 3.45              |
| 7              | <b>Binani Metals Ltd.</b>           | 1.72              | -1.33             | 4.77              | 6.16                   | 5.61              | 3.86              | 4.74              |
| 8              | <b>Blue Star Ltd.</b>               | 10.08             | 8.58              | 11.58             | 14.22                  | 17.26             | 18.1              | 17.68             |
| 9              | <b>Bright Bros Ltd.</b>             | -5.25             | -2.63             | -7.86             | 4.88                   | 2.71              | 4.04              | 3.38              |
| 10             | <b>Britannia Industries Ltd.</b>    | 21.83             | 18.32             | 25.33             | 75.67                  | 38.28             | 47.31             | 42.8              |
| 11             | <b>DLF Ltd.</b>                     | 8.88              | 2.65              | 15.1              | 9.12                   | 4.51              | 7.48              | 6                 |
| 12             | <b>ECE industries Ltd.</b>          | 2.11              | 3.48              | 0.73              | 17.43                  | 3.45              | 2.86              | 3.16              |
| 13             | <b>Eicher Motors Ltd.</b>           | 22.13             | 21.81             | 22.44             | 29.64                  | 28.01             | 46.14             | 37.08             |
| 14             | <b>EID Parry India Ltd.</b>         | 5.78              | 13.41             | -1.86             | 78.59                  | 23.77             | 4.58              | 14.18             |
| 15             | <b>Entertainment Net. (I) Ltd.</b>  | -2.02             | -2.51             | -1.53             | 6.2                    | 6.11              | 3.4               | 4.76              |
| 16             | <b>FDC Ltd.</b>                     | 24.69             | 24.21             | 25.17             | 3.84                   | 4.16              | 6.92              | 5.54              |
| 17             | <b>Fine Line Circuits Ltd.</b>      | 0.42              | 0.06              | 0.77              | 1.19                   | 1.05              | 0.08              | 0.57              |
| 18             | <b>Gateway Distriparks Ltd.</b>     | 7.44              | 8.37              | 6.51              | 8.7                    | 7.16              | 7.86              | 7.51              |
| 19             | <b>Gee Cee Ventures Ltd.</b>        | 11.06             | 9.85              | 12.27             | 40.39                  | 3.6               | 17.14             | 10.37             |
| 20             | <b>Gemini Com. Ltd.</b>             | 0.88              | 0.83              | 0.92              | 0.18                   | -0.16             | -14.51            | -7.34             |
| 21             | <b>Geodesic Ltd.</b>                | 19.83             | 20.76             | 18.9              | 26.03                  | -1.9              | -4.77             | -3.34             |

|    |                                      |       |       |       |        |       |       |       |
|----|--------------------------------------|-------|-------|-------|--------|-------|-------|-------|
| 22 | <b>Godavari Pow. &amp; Is. Ltd.</b>  | 27.43 | 21.02 | 33.84 | 20.43  | 18.31 | 22.44 | 20.38 |
| 23 | <b>Godrej Industries Ltd.</b>        | 1.77  | 3.19  | 0.35  | 2.55   | 4.2   | 6.35  | 5.28  |
| 24 | <b>Great Offshore Ltd.</b>           | 44.1  | 37.1  | 51.09 | 53.21  | 46.9  | 27.32 | 37.11 |
| 25 | <b>GTL Ltd.</b>                      | -0.45 | -0.2  | -0.7  | -0.81  | 0.03  | -0.03 | 0     |
| 26 | <b>Gujrat Petrosynthese Ltd.</b>     | 1.72  | 1.65  | 1.78  | 7.36   | 9     | 9.28  | 9.14  |
| 27 | <b>HEG Ltd.</b>                      | 32.64 | 25.13 | 40.15 | 30.05  | 15.6  | 26.48 | 21.04 |
| 28 | <b>Heritage Food (I) Ltd.</b>        | 6.59  | 5.67  | 7.5   | 10.3   | 14.93 | 17.64 | 16.29 |
| 29 | <b>Hindalco Industries Ltd.</b>      | 88.17 | 85.29 | 91.05 | 92.12  | 62.95 | 90.71 | 76.83 |
| 30 | <b>Hindustan Composites Ltd.</b>     | -1.44 | -3.62 | 0.74  | 40.72  | 42.5  | 20.72 | 31.61 |
| 31 | <b>Hindustan Unilever Ltd.</b>       | 7.41  | 6.4   | 8.41  | 8.12   | 11.47 | 10.09 | 10.78 |
| 32 | <b>Hydro S and S Ind. Ltd.</b>       | 6.36  | 4.5   | 8.22  | -2.82  | -0.02 | 1.64  | 0.81  |
| 33 | <b>ICI India Ltd.</b>                | 11.09 | 10.74 | 11.43 | 105.13 | 14.33 | 74.66 | 44.5  |
| 34 | <b>India Forge &amp; Stamp. Ltd.</b> | 1.42  | 0.9   | 1.94  | 2.8    | 4.45  | 3.33  | 3.89  |
| 35 | <b>India Nippon Electrical Ltd</b>   | 25.03 | 23.13 | 26.93 | 37.08  | 34.29 | 30.93 | 32.61 |
| 36 | <b>Infinite Computer Sol. Ltd.</b>   | 8.91  | 9.99  | 7.82  | 17.67  | 24.97 | 14.33 | 19.65 |
| 37 | <b>International Conv. Ltd.</b>      | 6.02  | 6.84  | 5.2   | 7.84   | 6.56  | 11.43 | 9     |
| 38 | <b>Ipca Laboratories Ltd.</b>        | 52.57 | 48.89 | 56.25 | 36.5   | 16.7  | 21.11 | 18.91 |
| 39 | <b>IVP Ltd.</b>                      | 2.98  | 2.36  | 3.59  | 6.29   | 6.41  | 1.57  | 3.99  |
| 40 | <b>JK Lakshmi Cement Ltd.</b>        | 12.27 | 19.71 | 4.83  | 8.89   | 14.93 | 7.9   | 11.42 |
| 41 | <b>Kale Consultants Ltd.</b>         | 11.13 | 13.86 | 8.39  | 21.05  | 47.73 | 60.02 | 53.88 |
| 42 | <b>KRBL Ltd.</b>                     | 3.84  | 4.75  | 2.93  | 6.22   | 11.27 | 11.93 | 11.6  |
| 43 | <b>LKP Finance Ltd.</b>              | 14.31 | -5.38 | 33.99 | 67.19  | 14.69 | 19.97 | 17.33 |
| 44 | <b>Maestros Medline Sys. Ltd.</b>    | 1.99  | 1.24  | 2.74  | 0.45   | 0.5   | 5.72  | 3.11  |
| 45 | <b>Manugraph India Ltd.</b>          | 3.31  | 2.73  | 3.88  | 10.42  | 2.1   | 20.95 | 11.53 |
| 46 | <b>Mastek Ltd.</b>                   | 23.57 | 20.15 | 26.98 | 8.83   | 34.16 | 17.51 | 25.84 |
| 47 | <b>Mazda India Ltd.</b>              | 2.13  | 2.06  | 2.2   | 3.78   | 6.96  | 1.87  | 4.42  |
| 48 | <b>Merck Ltd.</b>                    | 39.1  | 40.82 | 37.37 | 39.45  | 38.06 | 38.36 | 38.21 |

|           |                                     |       |       |       |       |        |        |        |
|-----------|-------------------------------------|-------|-------|-------|-------|--------|--------|--------|
| <b>49</b> | <b>Monnet Ispat &amp; Ene. Ltd.</b> | 36.94 | 39.25 | 34.62 | 45.04 | 55.5   | 43.7   | 49.6   |
| <b>50</b> | <b>Natco Pharma Ltd.</b>            | 4.68  | 0.6   | 8.76  | 11.02 | 14.28  | 15.24  | 14.76  |
| <b>51</b> | <b>OCL Ltd.</b>                     | 8.29  | 8.04  | 8.54  | 5.55  | 25.68  | 37.97  | 31.83  |
| <b>52</b> | <b>Onmobile Global Ltd.</b>         | 12.29 | 9.04  | 15.54 | 4.37  | 2.31   | -3.27  | -0.48  |
| <b>53</b> | <b>Panama Petrochem Ltd.</b>        | 49.28 | 63.02 | 35.54 | 13.8  | 19.1   | 3.41   | 11.26  |
| <b>54</b> | <b>Piramal Healthcare Ltd.</b>      | 17.19 | 13.17 | 21.21 | 7.58  | -13.42 | -21.44 | -17.43 |
| <b>55</b> | <b>Poddar Pigments Ltd.</b>         | 3.09  | 3.03  | 3.15  | 13.38 | 9      | 9.28   | 9.14   |
| <b>56</b> | <b>Polaris Software Lab. Ltd.</b>   | 6.19  | 6.93  | 5.45  | 1.35  | 8.07   | 5.33   | 6.7    |
| <b>57</b> | <b>Prime Securities Ltd.</b>        | 2.43  | 1.04  | 3.81  | 6.61  | 11.09  | 7.62   | 9.36   |
| <b>58</b> | <b>Rain Commodities Ltd.</b>        | 1.16  | -5.57 | 7.89  | 12.01 | 21.83  | -21.26 | 0.28   |
| <b>59</b> | <b>Reliance Industries Ltd.</b>     | 20.24 | 18    | 22.47 | 25.06 | 30.77  | 29.25  | 30.01  |
| <b>60</b> | <b>Reliance Infra. Ltd.</b>         | 40.47 | 35.07 | 45.86 | 50.39 | 47.03  | 40.42  | 43.73  |
| <b>61</b> | <b>Sandesh Ltd.</b>                 | 31.33 | 30.5  | 32.16 | 43.42 | 51.47  | 45.9   | 48.69  |
| <b>62</b> | <b>Sasken Com. Techno. Ltd.</b>     | 11.06 | 13.38 | 8.73  | 9.5   | 28.04  | 34.25  | 31.15  |
| <b>63</b> | <b>Sirpur Paper Ltd.</b>            | 16.69 | 19.44 | 13.93 | 14.95 | 21.49  | 16.9   | 19.2   |
| <b>64</b> | <b>SRF Polymers Ltd.</b>            | 7.88  | 6.45  | 9.31  | 16.24 | 42.58  | 20.44  | 31.51  |
| <b>65</b> | <b>Tips Industries Ltd.</b>         | 5.76  | 6.62  | 4.9   | 1.87  | 5.52   | 7.61   | 6.57   |
| <b>66</b> | <b>TTK Healthcare Ltd.</b>          | 9.37  | 3.7   | 15.03 | 9.74  | 11.75  | 18.96  | 15.36  |
| <b>67</b> | <b>Tube Investment of (I) Ltd.</b>  | 14.71 | 14.69 | 14.73 | 24.84 | 44.66  | 26.67  | 35.67  |
| <b>68</b> | <b>United Phosphorus Ltd.</b>       | 4.17  | 3.41  | 4.92  | 4.7   | 9.7    | 10.81  | 10.26  |
| <b>69</b> | <b>Venky's (India) Ltd.</b>         | 10.87 | 11.21 | 10.52 | 7.88  | 17.17  | 17.74  | 17.46  |
| <b>70</b> | <b>Winsome Yarns Ltd.</b>           | 2.72  | 2.78  | 2.66  | 1.88  | 3.58   | 0.68   | 2.13   |
| <b>71</b> | <b>Zee Enter. Enterprise Ltd.</b>   | 5.5   | 5.89  | 5.11  | 6.72  | 7.95   | 7.15   | 7.55   |

Source: money control.com

## Appendix- D

### Mean Stock Price of 62 Buyback Companies

| Sr. No | Name of the Company          | SPTYB ABB | SPOHY BABB | SPOYB ABB | SPSMB ABB | SPOTD ABB | SPSMA ABB | SPOYA ABB | SPOHY AABB | SPTYA ABB |
|--------|------------------------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|------------|-----------|
| 1      | Addi Industries Ltd.         | 6.44      | 7.6        | 10.21     | 14.06     | 17.35     | 20.18     | 25.39     | 24.46      | 22.04     |
| 2      | Alembic Automobile Ltd.      | 62.76     | 63.66      | 56.73     | 43.13     | 29.05     | 34.18     | 38.98     | 41.67      | 46.89     |
| 3      | Allcargo Logistics Ltd.      | 149.62    | 145.37     | 140.48    | 129.34    | 129.1     | 132.12    | 123.03    | 113.3      | 127.24    |
| 4      | Allied Digital Services Ltd. | 256.63    | 215.88     | 194.03    | 152.79    | 92.3      | 35.96     | 30.41     | 28.27      | 25.24     |
| 5      | Amtek Automobile Ltd.        | 159.27    | 151.38     | 141.23    | 147.25    | 126.55    | 117.63    | 102.86    | 93.78      | 86.73     |
| 6      | Balrampur Chini Mills Ltd.   | 95.71     | 97.01      | 82.06     | 79.61     | 68.25     | 59.78     | 53.97     | 55.15      | 54.78     |
| 7      | Binani Metals Ltd.           | 175.8     | 140.5      | 110.33    | 67.07     | 38.05     | 45.71     | 64.14     | 78.83      | 98.27     |
| 8      | Blue Star Ltd.               | 46.06     | 38.44      | 40.24     | 43.38     | 59.15     | 66.24     | 69.1      | 78.89      | 93.52     |
| 9      | Bright Bros Ltd.             | 46.42     | 37.89      | 35.41     | 40        | 46.5      | 48.69     | 58.65     | 58.47      | 55.84     |
| 10     | Britannia Industries Ltd.    | 701.39    | 672.27     | 697.88    | 632.34    | 560       | 565.84    | 544.53    | 534.23     | 535.27    |
| 11     | Eicher Motors Ltd.           | 307.31    | 303        | 256.52    | 236.68    | 221.8     | 306.64    | 443.42    | 598.82     | 741.1     |
| 12     | EID Parry ( India ) Ltd.     | 160.8     | 172.95     | 188.37    | 187.31    | 154.2     | 187.72    | 256.16    | 292.81     | 322.38    |
| 13     | FDC Ltd.                     | 255.05    | 218.16     | 202.83    | 192.53    | 183       | 213.47    | 121.71    | 90.65      | 81.51     |
| 14     | Fine Line Circuits Ltd.      | 2.38      | 2.5        | 2.42      | 1.65      | 4.25      | 5.49      | 4.89      | 6.98       | 9.13      |
| 15     | Gateway Distriparks Ltd.     | 148.07    | 136.77     | 116.97    | 99.68     | 96.8      | 72.43     | 72.29     | 84.65      | 87.39     |
| 16     | Gee Cee Ventures Ltd.        | 75.56     | 73.83      | 81.84     | 92.72     | 91.15     | 69.66     | 61.59     | 53.9       | 49.07     |
| 17     | Gemini Communication Ltd.    | 27.64     | 24.59      | 22.79     | 22.25     | 24.1      | 21.37     | 15.78     | 11.77      | 9.28      |
| 18     | Geodesic Ltd.                | 112.56    | 98.38      | 117.56    | 118.31    | 109.4     | 98.62     | 90.61     | 79.83      | 71.69     |
| 19     | Godawari Pow. and Isp. Ltd.  | 178.72    | 203.55     | 209.19    | 166.5     | 79.55     | 65.95     | 101.75    | 144.53     | 161.36    |
| 20     | Godrej Industries Ltd.       | 180.17    | 175.95     | 107.94    | 60.93     | 133.2     | 175.99    | 165.82    | 175.54     | 177.15    |

|    |  |        |        |        |        |        |        |        |        |        |
|----|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 21 | <b>Goldiam International Ltd.</b>      | 21.96  | 24.93  | 29.9   | 37.1   | 68.4   | 83.1   | 70.36  | 63.77  | 55.75  |
| 22 | <b>HEG Ltd.</b>                        | 268.85 | 296.75 | 288.8  | 249.93 | 213.65 | 227.36 | 211.31 | 210.33 | 209.74 |
| 23 | <b>Heritage Food ( India ) Ltd.</b>    | 21.43  | 18.69  | 19.6   | 20.08  | 23.2   | 30.17  | 33.93  | 40.11  | 50.53  |
| 24 | <b>Hindalco Industries Ltd.</b>        | 734.58 | 728.49 | 715.16 | 632.15 | 727    | 688    | 621.38 | 653.79 | 785.05 |
| 25 | <b>Hindustan Composites Ltd.</b>       | 330    | 402.69 | 454.73 | 496.27 | 500.2  | 496.48 | 482.68 | 462.02 | 438.52 |
| 26 | <b>Hindustan Unilever Ltd.</b>         | 217.92 | 221.02 | 208.5  | 204.49 | 220.5  | 222.63 | 228.25 | 234.06 | 242.04 |
| 27 | <b>Hydro S &amp; S Industries Ltd.</b> | 42.14  | 44.38  | 40.32  | 29.58  | 30.4   | 35.63  | 34.3   | 35.48  | 33.63  |
| 28 | <b>ICI India Ltd.</b>                  | 280.74 | 309.61 | 343.83 | 363.48 | 308.6  | 384.22 | 434.24 | 471.35 | 500.44 |
| 29 | <b>India Nippon Electricals Ltd.</b>   | 223.29 | 178.23 | 160.8  | 177.25 | 186    | 161.83 | 184.67 | 205.58 | 203.43 |
| 30 | <b>Infinite Comp. Sol. (I) Ltd.</b>    | 137.54 | 142.76 | 130.8  | 96.26  | 58.8   | 89.45  | 109.49 | 104.97 | 106.99 |
| 31 | <b>IPCA Laboratories Ltd.</b>          | 612.37 | 616.4  | 586.39 | 541.22 | 327.85 | 391.83 | 568.9  | 605.8  | 529.8  |
| 32 | <b>J K Lakshmi Cement Ltd.</b>         | 53.28  | 48.53  | 44.3   | 41.65  | 63.95  | 74.18  | 105.11 | 98.74  | 92.18  |
| 33 | <b>Kale Consul. Ltd (Accelya)</b>      | 106.92 | 106.39 | 94.1   | 100.27 | 135.25 | 133.61 | 219.43 | 300.37 | 390.13 |
| 34 | <b>KRBL Ltd.</b>                       | 23.28  | 21.97  | 22.59  | 25.4   | 24.45  | 22.81  | 28.51  | 42.03  | 58.86  |
| 35 | <b>LKP Finance Ltd.</b>                | 104.99 | 116.62 | 108.74 | 77.61  | 56.25  | 84.93  | 99.15  | 106.51 | 112.8  |
| 36 | <b>Maestros Medline Syst. Ltd.</b>     | 33.72  | 38.26  | 45.55  | 39.23  | 34.5   | 47.06  | 46.19  | 48.2   | 49.53  |
| 37 | <b>Manugraph Industries Ltd.</b>       | 20.5   | 18.37  | 18.95  | 19.05  | 25.75  | 25.94  | 26.92  | 25.29  | 26.97  |
| 38 | <b>Mastek Ltd.</b>                     | 339.99 | 330.89 | 249.75 | 258.89 | 269    | 315.51 | 338.54 | 372.29 | 405.55 |
| 39 | <b>Merck Ltd.</b>                      | 350.66 | 335.39 | 321.04 | 333.12 | 390.05 | 476.57 | 556.75 | 611.53 | 612.18 |
| 40 | <b>Monnet Isp. and Energy Ltd.</b>     | 373.24 | 425.46 | 473.99 | 456.74 | 135.7  | 179.65 | 254.92 | 301.37 | 351.41 |
| 41 | <b>Natco Pharma Ltd.</b>               | 125.25 | 122.01 | 122.67 | 112.43 | 112.95 | 137.3  | 133.47 | 130.42 | 117.35 |
| 42 | <b>OCL India Ltd.</b>                  | 53.28  | 47     | 48.19  | 49.5   | 50.3   | 48.13  | 45.58  | 50.95  | 78.8   |
| 43 | <b>Onmobile Global Ltd.</b>            | 291.56 | 251.86 | 218.18 | 154.42 | 62.25  | 65.91  | 53.29  | 48.62  | 43.61  |
| 44 | <b>Panama Petrochem Ltd.</b>           | 191.99 | 176.59 | 150.56 | 138.51 | 135    | 124.23 | 131.91 | 149.26 | 126.88 |
| 45 | <b>Piramal Health Care Ltd.</b>        | 373.1  | 422.59 | 457.4  | 479.9  | 456.8  | 423.14 | 395.37 | 415.7  | 435.84 |

|           |                                      |         |         |        |        |        |         |         |         |         |
|-----------|--------------------------------------|---------|---------|--------|--------|--------|---------|---------|---------|---------|
| <b>46</b> | <b>Poddar Pigm Ltd.</b>              | 25.83   | 23.51   | 22.05  | 28.3   | 34.6   | 35.93   | 41.59   | 42.72   | 42.3    |
| <b>47</b> | <b>Polaris Software Lab. Ltd.</b>    | 147.73  | 154.33  | 137.26 | 130.68 | 98.7   | 126.58  | 119.38  | 115.97  | 132.2   |
| <b>48</b> | <b>Prime Securities Ltd.</b>         | 8.17    | 9.68    | 11.1   | 14.96  | 36.2   | 52.05   | 51.05   | 50.79   | 52.29   |
| <b>49</b> | <b>Rain Commodities Ltd.</b>         | 179.6   | 183.76  | 210.13 | 211.48 | 201    | 84.5    | 120.12  | 142.94  | 145.78  |
| <b>50</b> | <b>Reliance Industries Ltd.</b>      | 211.59  | 243.21  | 286.97 | 332.31 | 339    | 351.74  | 352.78  | 330.91  | 315.33  |
| <b>51</b> | <b>Reliance Infrastructure Ltd.</b>  | 1010.96 | 1157.44 | 927.96 | 650.98 | 506.85 | 1005.13 | 1045.02 | 1058.64 | 1006.88 |
| <b>52</b> | <b>Sandesh Ltd.</b>                  | 146.56  | 144.29  | 125.97 | 122.89 | 136.05 | 164.54  | 189.65  | 203.87  | 220.04  |
| <b>53</b> | <b>Sasken Com. Technology Ltd.</b>   | 364.47  | 377.44  | 317.85 | 212.47 | 196.45 | 125.2   | 90.4    | 103.83  | 122.72  |
| <b>54</b> | <b>Sirpur Paper Ltd.</b>             | 27.59   | 27.76   | 28.27  | 32.88  | 39.25  | 34.28   | 42.38   | 53.48   | 60.07   |
| <b>55</b> | <b>SRF Polymers Ltd.</b>             | 101.92  | 123.92  | 165.5  | 243.92 | 222.45 | 183.5   | 166.85  | 157.87  | 160.78  |
| <b>56</b> | <b>Tips Industries Ltd.</b>          | 39.21   | 42.15   | 47.11  | 46.78  | 44.85  | 37.78   | 32.79   | 35.09   | 40.32   |
| <b>57</b> | <b>TTK Health Care Ltd.</b>          | 76.67   | 77.69   | 80.89  | 82.63  | 91.2   | 121.53  | 184.44  | 239.61  | 279.1   |
| <b>58</b> | <b>Tube Investment of India Ltd.</b> | 67.41   | 70.49   | 76.6   | 81.37  | 90.8   | 99.46   | 126.06  | 152.42  | 164.87  |
| <b>59</b> | <b>United Phosphorus Ltd.</b>        | 157.2   | 147.74  | 143.75 | 135.7  | 119.2  | 121.49  | 126.8   | 133.03  | 154.95  |
| <b>60</b> | <b>Venky's (India) Ltd.</b>          | 46.89   | 41.37   | 38.33  | 41.59  | 46.5   | 46.14   | 50.33   | 56.55   | 58.72   |
| <b>61</b> | <b>Winsome Yarns Ltd.</b>            | 4.61    | 4.46    | 4.45   | 4.84   | 6.95   | 5.48    | 5.98    | 6.07    | 6.32    |
| <b>62</b> | <b>Zee Entertainment Ltd.</b>        | 175.75  | 135.69  | 126.47 | 124.38 | 124.45 | 165.91  | 191.98  | 207.73  | 222.67  |

## Appendix –E

### Mean Volume of Trading of 86 Stock Splits Companies

| Sr. No | Name of Company                 | VTTYBA SS | VTOHYB ASS | VTOYBA SS | VTSMBA SS | VTOTDA SS | VTSMMA SS | VTOYAA SS | VTOHYA ASS | VTTYAA SS |
|--------|---------------------------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|------------|-----------|
| 1      | Aarya Global Shares & Sec. Ltd. | 10975     | 14511      | 9117      | 7933      | 154806    | 521226    | 510188    | 412801     | 321397    |
| 2      | Anant Raj Ltd.                  | 9052      | 7159       | 4597      | 4201      | 44714     | 22971     | 56175     | 209556     | 244960    |
| 3      | Asahi Infrastructure            | 7741      | 6516       | 7678      | 13661     | 27690     | 69603     | 43392     | 43192      | 58832     |
| 4      | Astrazeneca Pharma India Ltd.   | 370       | 381        | 298       | 406       | 1282      | 439       | 313       | 650        | 604       |
| 5      | Bajaj Electricals Ltd           | 6352      | 7887       | 9790      | 13760     | 61608     | 205709    | 172909    | 146331     | 157495    |
| 6      | Bajaj Hindustan Ltd.            | 5576      | 7334       | 10127     | 13143     | 5431      | 127677    | 280837    | 359027     | 506219    |
| 7      | Banco Products (India) Ltd.     | 8872      | 9450       | 8892      | 12333     | 267687    | 58269     | 33267     | 24767      | 40941     |
| 8      | Bayercrop Science               | 318       | 385        | 204       | 206       | 2120      | 5230      | 9529      | 33093      | 37509     |
| 9      | Bharat Heavy Electricals Ltd.   | 706681    | 643856     | 708644    | 680050    | 1911230   | 5889395   | 5256810   | 5000460    | 5056161   |
| 10     | Bharti Airtel Ltd               | 3998361   | 4535790    | 5244492   | 4758130   | 9645734   | 10832618  | 8584482   | 7721824    | 7426985   |
| 11     | BLS InfoTech Ltd.               | 21512     | 27635      | 41053     | 69419     | 608966    | 141484    | 88326     | 109514     | 124037    |
| 12     | Bombay Bur. Trad. Corp. Ltd.    | 34834     | 32118      | 47109     | 6377      | 37706     | 45519     | 41178     | 37109      | 174482    |
| 13     | Carborundum Universal Ltd.      | 6441      | 8233       | 10282     | 9651      | 7076      | 60273     | 69916     | 81899      | 70341     |
| 14     | Century Ply boards (India) Ltd. | 10795     | 12774      | 8421      | 12716     | 145930    | 54810     | 122404    | 119526     | 115459    |
| 15     | CHD Developers Ltd.             | 4920      | 6444       | 9478      | 17635     | 27405     | 21502     | 37905     | 65334      | 108554    |
| 16     | Chemfab Alkalis Ltd.            | 4057      | 3638       | 5027      | 4242      | 11336     | 8485      | 6967      | 5463       | 4617      |
| 17     | Core Education & Tech. Ltd.     | 23798     | 28419      | 41966     | 62997     | 2876645   | 528963    | 416369    | 911130     | 823771    |
| 18     | Diamant Infrastructures         | 3242      | 1970       | 2054      | 3119      | 5770      | 223161    | 241811    | 259408     | 197544    |
| 19     | Diana Tea Company Ltd.          | 174       | 120        | 170       | 280       | 1252      | 33815     | 34113     | 57381      | 64536     |
| 20     | Divis Laboratories Ltd.         | 82716     | 99705      | 135505    | 127906    | 415988    | 199246    | 191234    | 190876     | 191927    |

|    |                                       |         |         |         |         |         |         |         |         |         |
|----|---------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 21 | <b>DJS Stock and Shares Ltd.</b>      | 12700   | 15000   | 20922   | 21155   | 232293  | 31629   | 19168   | 15906   | 13320   |
| 22 | <b>DSJ Communication Ltd.</b>         | 3066    | 1543    | 973     | 729     | 100     | 3617    | 83534   | 60079   | 50888   |
| 23 | <b>Dynacons Systems &amp;Sol.</b>     | 25396   | 31629   | 46600   | 91596   | 1225762 | 36898   | 62372   | 89752   | 77942   |
| 24 | <b>Eastern Silk Industries Ltd.</b>   | 31175   | 30139   | 25733   | 17347   | 114904  | 108999  | 119320  | 188760  | 186013  |
| 25 | <b>Electro Steel Castings Ltd</b>     | 10358   | 9322    | 7432    | 5730    | 700166  | 1819980 | 1096513 | 849521  | 934325  |
| 26 | <b>Emami Ltd.</b>                     | 32      | 41      | 52      | 80      | 1       | 362     | 4752    | 17798   | 24220   |
| 27 | <b>EMCO Ltd</b>                       | 11035   | 12266   | 10941   | 7227    | 16880   | 38129   | 68234   | 177998  | 172292  |
| 28 | <b>Exelom Infrastructure Ltd.</b>     | 31217   | 41601   | 44937   | 75574   | 33944   | 200241  | 121618  | 106772  | 82220   |
| 29 | <b>Frontline Business Sol.Ltd.</b>    | 48565   | 64493   | 96418   | 188890  | 407801  | 77924   | 70867   | 76565   | 115262  |
| 30 | <b>Gabriel India Ltd.</b>             | 26166   | 32913   | 38409   | 6038    | 369920  | 261735  | 160790  | 116173  | 121926  |
| 31 | <b>Gammon India Ltd.</b>              | 26338   | 33679   | 5636    | 4356    | 319973  | 115298  | 107985  | 135026  | 205295  |
| 32 | <b>Gangotri Iron &amp; Steel Ltd.</b> | 185706  | 239489  | 333312  | 611733  | 65711   | 175704  | 217433  | 221130  | 198856  |
| 33 | <b>Gati Ltd.</b>                      | 10989   | 14036   | 19591   | 31996   | 147423  | 30706   | 30136   | 37484   | 83897   |
| 34 | <b>Graphite India Ltd.</b>            | 19494   | 20828   | 24589   | 18976   | 209195  | 168010  | 229981  | 214355  | 170205  |
| 35 | <b>GRUH Finance Ltd.</b>              | 24320   | 26998   | 18041   | 23303   | 90870   | 79164   | 104103  | 98605   | 94551   |
| 36 | <b>HDFC Bank Ltd</b>                  | 2184533 | 2693032 | 3681086 | 4255147 | 1638519 | 2854379 | 3392946 | 4592693 | 4579967 |
| 37 | <b>Hero motocorp</b>                  | 14076   | 15172   | 17308   | 23950   | 26160   | 89240   | 168935  | 191940  | 248542  |
| 38 | <b>Hexaware Tech. Ltd.</b>            | 576937  | 212937  | 107251  | 76595   | 653491  | 319167  | 307106  | 240178  | 250484  |
| 39 | <b>Hindustan Nat. Glass Ltd.</b>      | 2120    | 1653    | 1947    | 3111    | 28768   | 74653   | 50185   | 33875   | 25557   |
| 40 | <b>Hotel Leela Venture Ltd.</b>       | 93356   | 38490   | 37117   | 45155   | 3859371 | 303520  | 355028  | 1052351 | 898089  |
| 41 | <b>ICSA (India) Ltd.</b>              | 46082   | 26774   | 20933   | 9124    | 212903  | 157615  | 112386  | 264095  | 334503  |
| 42 | <b>Indoco Remedies Ltd.</b>           | 4542    | 3740    | 3823    | 4588    | 104426  | 67221   | 58571   | 70612   | 146366  |
| 43 | <b>Jaipan Industries Ltd.</b>         | 35561   | 38469   | 56244   | 104192  | 100     | 17781   | 19157   | 14212   | 12699   |
| 44 | <b>Jenson &amp; Nicholson</b>         | 3177    | 4097    | 2409    | 3659    | 19825   | 5659    | 3295    | 5519    | 7238    |
| 45 | <b>Jindal Saw Ltd.</b>                | 267282  | 293002  | 408374  | 610293  | 1726600 | 1376321 | 919050  | 818235  | 731701  |

|    |                                   |         |         |         |         |         |         |         |         |         |
|----|-----------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 46 | <b>JMDE Pack. Realities Ltd.</b>  | 3438    | 3658    | 5165    | 6421    | 132572  | 24727   | 27867   | 27094   | 22002   |
| 47 | <b>JVL Agro Industries Ltd.</b>   | 57489   | 75678   | 105975  | 166598  | 1353812 | 286385  | 178328  | 129682  | 100864  |
| 48 | <b>KCP Ltd.</b>                   | 16562   | 21329   | 26552   | 8726    | 165353  | 72953   | 54893   | 55381   | 47785   |
| 49 | <b>KEC International Ltd.</b>     | 37596   | 31781   | 29579   | 37155   | 133661  | 214797  | 255110  | 346192  | 328435  |
| 50 | <b>Kedia Infotech Ltd.</b>        | 12559   | 16717   | 25063   | 50014   | 2877713 | 198084  | 127782  | 98810   | 79864   |
| 51 | <b>KENNAMETAL</b>                 | 290     | 383     | 524     | 807     | 88      | 1282    | 1044    | 1198    | 4937    |
| 52 | <b>Koffee Break Pictures Ltd.</b> | 30154   | 29840   | 31260   | 36674   | 79879   | 346328  | 573186  | 544778  | 485796  |
| 53 | <b>Kokuyo Camlin</b>              | 5179    | 3586    | 1448    | 993     | 177416  | 3278    | 26076   | 50722   | 126424  |
| 54 | <b>Kolar Biotech Ltd.</b>         | 3223    | 3786    | 5638    | 7791    | 3840    | 3393    | 2866    | 3176    | 4989    |
| 55 | <b>KPIT Technologies</b>          | 175210  | 95717   | 73209   | 18653   | 86495   | 38876   | 39264   | 33686   | 105131  |
| 56 | <b>Kulkarni Power Tools Ltd.</b>  | 10545   | 11960   | 8993    | 13360   | 36521   | 1924    | 1229    | 1474    | 8677    |
| 57 | <b>Lahoti Overseas Ltd.</b>       | 22166   | 29255   | 43653   | 66707   | 57050   | 21391   | 24525   | 20055   | 22523   |
| 58 | <b>Maharashtra Poly. Ltd.</b>     | 20495   | 12803   | 15845   | 23350   | 332666  | 284344  | 185717  | 124870  | 93912   |
| 59 | <b>Mercator Ltd</b>               | 43788   | 52537   | 30478   | 41920   | 173141  | 281891  | 347456  | 297971  | 294260  |
| 60 | <b>Minal Industries</b>           | 8497    | 10811   | 11049   | 4504    | 17876   | 20986   | 12617   | 15030   | 11292   |
| 61 | <b>Minaxi Textiles Ltd.</b>       | 20049   | 22033   | 30335   | 57336   | 1000    | 56905   | 281302  | 195037  | 147452  |
| 62 | <b>Mindvision Capital Ltd.</b>    | 8813    | 11707   | 10800   | 8318    | 1200    | 29333   | 24817   | 26582   | 23032   |
| 63 | <b>Mobile Telecommunication</b>   | 25364   | 18180   | 18205   | 7145    | 41388   | 10697   | 29002   | 65621   | 64430   |
| 64 | <b>Motherson Sumi Syst.Ltd.</b>   | 372     | 260     | 215     | 372     | 225     | 4122    | 7317    | 15859   | 34681   |
| 65 | <b>National Peroxide Ltd</b>      | 379     | 354     | 427     | 405     | 64      | 10672   | 6603    | 8766    | 9824    |
| 66 | <b>ONGC Ltd.</b>                  | 1617790 | 1276638 | 1270120 | 1003800 | 4582652 | 6241582 | 5017440 | 4490506 | 4654938 |
| 67 | <b>Paramount Comm. Ltd.</b>       | 206021  | 264229  | 272802  | 443390  | 2075774 | 361656  | 666110  | 500462  | 390962  |
| 68 | <b>Phoenix Mills Ltd</b>          | 103     | 65      | 72      | 76      | 100     | 8670    | 7541    | 9158    | 8187    |
| 69 | <b>Rainbow Papers Ltd.</b>        | 16927   | 21431   | 21166   | 37232   | 169128  | 106172  | 109497  | 114292  | 95412   |
| 70 | <b>Ramco Cements Ltd</b>          | 9861    | 9662    | 11773   | 7102    | 256772  | 53208   | 362419  | 347926  | 304939  |

|           |   |        |        |        |        |         |         |          |          |          |
|-----------|---|--------|--------|--------|--------|---------|---------|----------|----------|----------|
| <b>71</b> | <b>Religare Tech. Global Ltd.</b>         | 23254  | 30162  | 32252  | 51758  | 43151   | 22055   | 39559    | 30064    | 25244    |
| <b>72</b> | <b>Sarang Chemicals</b>                   | 12541  | 14381  | 6894   | 11750  | 10100   | 74990   | 61745    | 58323    | 196667   |
| <b>73</b> | <b>Shalimar Productions Ltd.</b>          | 3243   | 2618   | 2136   | 3471   | 28200   | 63596   | 71354    | 112735   | 108016   |
| <b>74</b> | <b>Suzlon Energy Ltd.</b>                 | 701191 | 631342 | 665532 | 607747 | 2852514 | 7443618 | 18014281 | 27103281 | 29962110 |
| <b>75</b> | <b>Swan Energy Ltd.</b>                   | 454    | 559    | 586    | 989    | 1539650 | 107697  | 158395   | 126275   | 101285   |
| <b>76</b> | <b>S.Vinayaka Art &amp; Heritage Ltd.</b> | 456    | 596    | 886    | 1422   | 1       | 5296    | 20408    | 21561    | 20484    |
| <b>77</b> | <b>Symphony Ltd.</b>                      | 4071   | 3580   | 1962   | 2091   | 31737   | 15238   | 13344    | 22356    | 19380    |
| <b>78</b> | <b>Tata Global Beverages</b>              | 147757 | 169164 | 173015 | 101695 | 2909074 | 1869747 | 1558072  | 1546402  | 2398673  |
| <b>79</b> | <b>TVS Motor Company Ltd.</b>             | 18739  | 19684  | 21397  | 30579  | 609589  | 93372   | 220357   | 262672   | 399977   |
| <b>80</b> | <b>Ultramarine &amp; Pigments Ltd.</b>    | 2966   | 3232   | 3484   | 3138   | 33235   | 21035   | 16635    | 17799    | 19592    |
| <b>81</b> | <b>Unity Infraprojects Ltd.</b>           | 36338  | 42937  | 57362  | 37294  | 707275  | 98908   | 126341   | 107409   | 154646   |
| <b>82</b> | <b>Walchand Peoplefirst Ltd.</b>          | 198    | 149    | 139    | 102    | 2399    | 619     | 768      | 910      | 731      |
| <b>83</b> | <b>Winsome Textile Ind. Ltd.</b>          | 23371  | 26762  | 34073  | 42276  | 457780  | 169834  | 330454   | 245419   | 218567   |
| <b>84</b> | <b>Wipro</b>                              | 8946   | 10693  | 6343   | 5860   | 162231  | 72375   | 227522   | 384313   | 583301   |
| <b>85</b> | <b>Zenith Healthcare Ltd.</b>             | 5840   | 7420   | 10064  | 14763  | 8000    | 7161    | 16831    | 20800    | 28779    |
| <b>86</b> | <b>Zyden Gentec Ltd.</b>                  | 5569   | 5334   | 6759   | 10920  | 209901  | 52260   | 52822    | 51136    | 43588    |

## Appendix –F

### Mean Stock Price of 86 Stock Splits Companies

| Sr.No | Name of Company                                  | SPOTDASS | SPSMAASS | SPOYAASS | SPOHYAASS | SPTYAASS |
|-------|--|----------|----------|----------|-----------|----------|
| 1     | <b>Aarya Global Shares &amp; Securities Ltd.</b> | 17.4     | 24.14    | 21.01    | 15.23     | 12.28    |
| 2     | <b>Anant Raj Ltd.</b>                            | 302.85   | 315.03   | 223.33   | 168.37    | 159.02   |
| 3     | <b>Asahi Infrastructure</b>                      | 2.2      | 4.11     | 3.2      | 3.1       | 3        |
| 4     | <b>Astrazeneca Pharma India Ltd.</b>             | 654.35   | 692.09   | 664.18   | 639.64    | 612.38   |
| 5     | <b>Bajaj Electricals Ltd</b>                     | 174.7    | 220.23   | 240.12   | 239.45    | 224.59   |
| 6     | <b>Bajaj Hindustan Ltd.</b>                      | 548.1    | 60.93    | 100.53   | 127.24    | 191.94   |
| 7     | <b>Banco Products (India) Ltd.</b>               | 35.25    | 36.49    | 32.08    | 28.59     | 33.64    |
| 8     | <b>Bayercrop Science</b>                         | 220.1    | 219.44   | 204.54   | 213.95    | 435.48   |
| 9     | <b>Bharat Heavy Electricals Ltd.</b>             | 319.9    | 260.23   | 242.22   | 231.55    | 212.36   |
| 10    | <b>Bharti Airtel Ltd</b>                         | 415.95   | 345.32   | 316.24   | 325.12    | 338.63   |
| 11    | <b>BLS InfoTech Ltd.</b>                         | 1.75     | 0.56     | 0.5      | 0.53      | 0.57     |
| 12    | <b>Bombay Burmah Trading Corp. Ltd.</b>          | 118.6    | 120.57   | 111.48   | 109.36    | 145.76   |
| 13    | <b>Carborundum Universal Ltd.</b>                | 326      | 101.65   | 107.03   | 116.28    | 124.09   |
| 14    | <b>Century Ply boards (India) Ltd.</b>           | 72.65    | 52.42    | 41.28    | 41.95     | 43.59    |
| 15    | <b>CHD Developers Ltd.</b>                       | 3.8      | 3.87     | 4        | 8.49      | 10.52    |
| 16    | <b>Chemfab Alkalis Ltd.</b>                      | 192.2    | 142.48   | 127.96   | 119.81    | 114.05   |
| 17    | <b>Core Education &amp; Technologies Ltd.</b>    | 142.25   | 236.72   | 220      | 198.2     | 170.32   |
| 18    | <b>Diamant Infrastructures</b>                   | 35.25    | 53.51    | 44.66    | 33.43     | 26.08    |
| 19    | <b>Diana Tea Company Ltd.</b>                    | 24       | 22.33    | 18.99    | 16.15     | 15.02    |

|    |   |         |         |        |         |         |
|----|---|---------|---------|--------|---------|---------|
| 20 | <b>Divis Laboratories Ltd.</b>                  | 1302.35 | 1537.92 | 1479   | 1361.32 | 1234.56 |
| 21 | <b>DJS Stock and Shares Ltd.</b>                | 2.85    | 1.16    | 0.91   | 0.82    | 0.84    |
| 22 | <b>DSJ Communication Ltd.</b>                   | 0.3     | 0.8     | 0.85   | 0.76    | 0.72    |
| 23 | <b>Dynacons Systems &amp; solutions</b>         | 0.7     | 0.46    | 0.43   | 0.41    | 0.37    |
| 24 | <b>Eastern Silk Industries Ltd.</b>             | 20.35   | 13.52   | 12.13  | 13.18   | 13.53   |
| 25 | <b>Electro Steel Castings Ltd</b>               | 52.95   | 66.87   | 51.95  | 39.62   | 38.43   |
| 26 | <b>Emami Ltd.</b>                               | 151.2   | 48.87   | 59.53  | 67.2    | 84.03   |
| 27 | <b>EMCO Ltd</b>                                 | 205.85  | 133.73  | 83.35  | 83.65   | 84.34   |
| 28 | <b>Exelom Infrastructure Ltd.</b>               | 51.75   | 63.47   | 39.88  | 29.58   | 23.56   |
| 29 | <b>Frontline Business Solutions Ltd.</b>        | 116.1   | 26.59   | 15.72  | 15.45   | 16      |
| 30 | <b>Gabriel India Ltd.</b>                       | 30.65   | 31.73   | 31.34  | 31      | 29.73   |
| 31 | <b>Gammon India Ltd.</b>                        | 259.6   | 304.87  | 384.18 | 386.06  | 384.45  |
| 32 | <b>Gangotri Iron &amp; Steel Ltd.</b>           | 43.9    | 45.8    | 49.54  | 47.49   | 46.08   |
| 33 | <b>Gati Ltd.</b>                                | 101.15  | 85.48   | 89.45  | 93.54   | 102.33  |
| 34 | <b>Graphite India Ltd.</b>                      | 59.65   | 55.66   | 62.43  | 60.89   | 56.98   |
| 35 | <b>GRUH Finance Ltd.</b>                        | 157.1   | 208.4   | 210.83 | 218.19  | 232.52  |
| 36 | <b>HDFC Bank Ltd</b>                            | 703.6   | 664     | 666.09 | 706.89  | 738.55  |
| 37 | <b>Hero motocorp</b>                            | 790.55  | 159.84  | 222.15 | 247.31  | 246.19  |
| 38 | <b>Hexaware Technologies Ltd.</b>               | 140.15  | 112.87  | 124.34 | 132.57  | 142.55  |
| 39 | <b>Hindustan National Glass &amp; Ind. Ltd.</b> | 140.95  | 215.04  | 225.63 | 226.01  | 215.29  |
| 40 | <b>Hotel Leela Venture Ltd.</b>                 | 70.05   | 61.6    | 56.43  | 55.4    | 50.62   |
| 41 | <b>ICSA (India) Ltd.</b>                        | 322.45  | 470.58  | 384.03 | 293.07  | 266.92  |
| 42 | <b>Indoco Remedies Ltd.</b>                     | 59.05   | 63.33   | 62.8   | 66.52   | 84.93   |

|    |                                      |         |        |        |        |        |
|----|--------------------------------------|---------|--------|--------|--------|--------|
| 43 | <b>Jaipan Industries Ltd.</b>        | 1.7     | 1.02   | 0.99   | 4.03   | 6.78   |
| 44 | <b>Jenson &amp; Nicholson</b>        | 14.1    | 8.85   | 7.7    | 7.11   | 6.83   |
| 45 | <b>Jindal Saw Ltd.</b>               | 191.7   | 198.73 | 199.26 | 195.65 | 180.65 |
| 46 | <b>JMDE Packaging Realities Ltd.</b> | 0.91    | 0.67   | 0.61   | 0.59   | 0.6    |
| 47 | <b>JVL Agro Industries Ltd.</b>      | 38.85   | 22.43  | 19.61  | 18.52  | 17.6   |
| 48 | <b>KCP Ltd.</b>                      | 32.1    | 28.89  | 27.3   | 27.53  | 28.78  |
| 49 | <b>KEC International Ltd.</b>        | 96.5    | 82.69  | 69.27  | 65.3   | 64.89  |
| 50 | <b>Kedia Infotech Ltd.</b>           | 6.2     | 2.36   | 1.82   | 1.42   | 1.2    |
| 51 | <b>KENNAMETAL</b>                    | 2494.15 | 75.18  | 62.46  | 58.14  | 65.32  |
| 52 | <b>Koffee Break Pictures Ltd.</b>    | 3.25    | 2.98   | 2.84   | 2.53   | 2.36   |
| 53 | <b>Kokuyo Camlin</b>                 | 20.25   | 10.48  | 13.62  | 17.3   | 21.29  |
| 54 | <b>Kolar Biotech Ltd.</b>            | 15.25   | 19.15  | 18.07  | 26.75  | 27.22  |
| 55 | <b>KPIT Technologies</b>             | 341.65  | 319.52 | 332.57 | 358.84 | 362.64 |
| 56 | <b>Kulkarni Power Tools Ltd.</b>     | 103     | 67.98  | 51.18  | 46.6   | 50.72  |
| 57 | <b>Lahoti Overseas Ltd.</b>          | 13.4    | 8.48   | 7.73   | 7.42   | 7.47   |
| 58 | <b>Maharashtra Polybutenes Ltd.</b>  | 13.85   | 12.19  | 12.27  | 11.08  | 10.05  |
| 59 | <b>Mercator Ltd</b>                  | 79.5    | 86.76  | 106.82 | 84.55  | 73.05  |
| 60 | <b>Minal Industries</b>              | 9.85    | 6.07   | 5.21   | 4.97   | 4.59   |
| 61 | <b>Minaxi Textiles Ltd.</b>          | 2.7     | 1.92   | 1.93   | 1.64   | 1.37   |
| 62 | <b>Mindvision Capital Ltd.</b>       | 13.31   | 11.99  | 10.85  | 11.14  | 11.05  |
| 63 | <b>Mobile Telecommunication</b>      | 1.9     | 1.65   | 2      | 2.45   | 3.2    |
| 64 | <b>Motherson Sumi Systems Ltd.</b>   | 87      | 64.29  | 122.29 | 150.52 | 127.1  |
| 65 | <b>National Peroxide Ltd</b>         | 343.45  | 283.22 | 258.85 | 259.39 | 252.25 |

|    |  |         |         |         |         |         |
|----|--|---------|---------|---------|---------|---------|
| 66 | <b>Oil &amp; Natural Gas Corporation Ltd.</b>  | 282.05  | 281.16  | 276.94  | 275.65  | 279.05  |
| 67 | <b>Paramount Communications Ltd.</b>           | 55.15   | 32.21   | 32.53   | 30.66   | 25.77   |
| 68 | <b>Phoenix Mills Ltd</b>                       | 701.7   | 786.09  | 823.45  | 1118.34 | 1382.03 |
| 69 | <b>Rainbow Papers Ltd.</b>                     | 46.45   | 55.91   | 58.74   | 60.23   | 64.28   |
| 70 | <b>Ramco Cements Ltd</b>                       | 107.65  | 67      | 88.77   | 97.17   | 99.4    |
| 71 | <b>Religare Technova Global Sol. Ltd.</b>      | 43.15   | 49.73   | 68.42   | 78.31   | 83.52   |
| 72 | <b>Sarang Chemicals</b>                        | 0.33    | 0.76    | 0.68    | 0.6     | 0.56    |
| 73 | <b>Shalimar Productions Ltd.</b>               | 9.25    | 40.52   | 36.73   | 25.02   | 19.37   |
| 74 | <b>Suzlon Energy Ltd.</b>                      | 366.05  | 258.14  | 176.22  | 142.37  | 127.55  |
| 75 | <b>Swan Energy Ltd.</b>                        | 103.45  | 76.13   | 90.73   | 90.14   | 79.21   |
| 76 | <b>Swasti Vinayaka Art &amp; Heritage Ltd.</b> | 4       | 5.18    | 5.35    | 4.86    | 4.52    |
| 77 | <b>Symphony Ltd.</b>                           | 305     | 241.88  | 296.4   | 306.84  | 335.88  |
| 78 | <b>Tata Global Beverages</b>                   | 121.55  | 117.08  | 106.13  | 101.45  | 104.68  |
| 79 | <b>TVS Motor Company Ltd.</b>                  | 115.95  | 85.38   | 81.95   | 78.56   | 81.06   |
| 80 | <b>Ultramarine &amp; Pigments Ltd.</b>         | 76.75   | 50.88   | 45.55   | 45.66   | 45.04   |
| 81 | <b>Unity Infraprojects Ltd.</b>                | 130.75  | 107.28  | 92.57   | 79.94   | 70.22   |
| 82 | <b>Walchand Peoplefirst Ltd.</b>               | 112.35  | 81.63   | 72.82   | 69.23   | 61.94   |
| 83 | <b>Winsome Textile Industries Ltd.</b>         | 6.2     | 4       | 4.69    | 4.98    | 14.66   |
| 84 | <b>Wipro</b>                                   | 1444.15 | 3481.22 | 3116.41 | 2855.19 | 2494.69 |
| 85 | <b>Zenith Healthcare Ltd.</b>                  | 0.9     | 0.77    | 0.59    | 0.62    | 0.62    |
| 86 | <b>Zyden Gentec Ltd.</b>                       | 3.45    | 2.52    | 2.28    | 2.13    | 2.03    |