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FINANCE INDIA  
© Indian Institute of Finance  
Vol. XXIII No. 2, June 2009  
Pages – 575 – 604

## Analysis of Quarterly Earnings Announcement and Informational Efficiency of Indian Capital Market

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### Abstract

An efficient and integrated capital market is an important infrastructure that facilitates capital formation. The efficiency with which the capital formation is carried out depends on the efficiency of the capital markets and financial institutions. A capital market is said to be efficient with respect to an information item if the prices of securities fully impound the returns implications of that item. Against this background, an attempt is made in this study to empirically examine the informational efficiency of Indian Capital Market with regard to quarterly earnings released by IT Sector, FMCG sector, Banking Sector, Capital Goods sector and Automobile Sector in the semi strong form of EMH. This study concludes that Indian Capital Market is not perfectly efficient in the semi-strong form of EMH which can be exploited by the investors to make abnormal returns.

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### 1. Introduction

A CAPITAL MARKET is said to be efficient with respect to an information item if the prices of securities fully impound the returns implications of that item. In an efficient market, when a new information item is added to the market, its revaluation implications for security returns are instantaneously and unbiasedly impounded in the current market price. Several studies have empirically tested the reaction of security prices to the release of different information.

#### 1.1 Informational Efficiency of Capital Market

A capital market in which stock prices fully reflect all available information can be termed as informationally efficient market. Eugene Fama (1960) classifies the informational efficiency into the following three

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Submitted October 2006; Accepted September 2008

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categories depending on the information set that is fully reflected in the security prices.

- *Weak - Form of Efficiency*, popularly known as Random Walk Theory, asserts that the current stock prices reflect all the information that is contained in the historical sequence of prices.
- *Semi - Strong Form of Efficiency* theory states that current market prices not only reflect all information content of historical prices but also reflect all the information, which are publicly available about the companies being studied.
- *Strong - Form of Efficiency* theory states that current market prices reflect all information whether it is publicly available or insiders' information.

## II. Review of Literature

This section provides an overview of earlier studies carried out in the area of research. Ball and Brown (1968), Beaver (1968), Beaver, Clarke, Wright (1979), Foster (1981), Maingot (1984), McEnally (1971), and Richardson (1984) have made an attempt in their studies to find reaction in the security prices with reference to the release of accounting information. These studies found that during the announcement period, there has been abnormal returns. Dutta Abhijit (2001), Obaidullah, M (1992), Das Prabina, S. Srinivasan and Dutta A.K (2000), Srinivasan, RC (1997), Jijo Lukose and Narayan Rao (2002) have tested the efficiency of the Indian capital market with respect to the release of accounting information. For the purpose of this paper, the important studies are briefly reviewed below.

McEnally (1971) and Beaver, Clarke and Wright (1979) report significant contemporaneous correlations between the magnitude and sign of unexpected annual earnings changes and the magnitude and sign of abnormal returns in the period preceding the annual earnings release.

Das Prabina, S.Srinivasan and A.K.Dutta (2000) have studied the reaction of GDR prices and the underlying share prices to the announcement of dividends. The study found that the CAR for the GDR is mostly negative irrespective of the rate of dividend, whereas the domestic share prices react in a more synchronous manner.

Dutta Abhijit (2001) has examined the investors' reaction to information using primary data collected from 600 individual investors and observes that the individual investors are less reactive to bad news as they invest for longer period.

Chaturvedi Hari Om (2002) observed that the cumulative abnormal returns (CAR) between the portfolios with positive and negative unexpected half-yearly earnings was significant. The researcher further observed that more than half of the stock price adjustment occurred in the post announcement period.

Lukose Jijo and Narayan Rao (2002) examined the security price behaviour around the announcement of stock splits and around ex-split.

date. They found that there is 7.69 percent abnormal returns during the two days (i.e. the day of announcement of stock split and the next day). The study also found significant abnormal returns around ex-split date.

A few Indian studies have tested the efficiency of the Indian capital market with respect to quarterly earnings information. Further, these studies could not find out the exact period during which the market reacts to an information.

### III. The Study

#### 3.1 Objectives of the Study

The major objective of the study is to empirically test the informational efficiency of the Indian capital market with special reference to the shares of select IT, FMCG, Banking, Capital Goods, and Automobile sector companies.

The specific objectives of the study are as follows;

- To examine the information content of the quarterly earnings announcement made by the companies
- To test the speed with which the quarterly earnings informations are instantaneously and unbiasedly impounded in the share prices
- To test the direction of change in the security prices to the direction of changes in the quarterly earnings
- To test whether there is any difference in the reaction of security prices of various industrial sector securities.

#### 3.2 Test of Hypothesis

For the purpose of this study, two sets of hypotheses were developed and tested for entire sample companies.

**Set-I: The null and alternative hypotheses framed for testing Average Security Returns Variability (ASRV) are as follows**

Hypothesis H<sub>0</sub>:  $ASRV = 1$  - The quarterly earnings announcement do not contain information relevant for valuation of securities and hence the security prices do not react to the announcement of quarterly earnings announcement.

Hypothesis H<sub>1</sub>:  $ASRV > 1$  - The quarterly earnings announcement contain information relevant for valuation of securities.

**Set-II: The null and alternative hypotheses framed for testing Average Abnormal Returns (AAR) are as follows**

Hypothesis H<sub>0</sub>:  $AAR = 0$  - There is no reaction in the security prices and hence the abnormal returns are zero

Hypothesis H<sub>1</sub>:  $AAR > 0$  - the security prices reacted positively to the announcement of quarterly earnings if the change in the quarterly earnings is positive and hence the abnormal returns is greater than zero

OR

$AAR < 0$  - the security prices reacted negatively to the announcement of quarterly earnings if the change in the quarterly earnings is negative and hence the abnormal returns are smaller than zero.

### 3.3 Scope of the Study

The present study tests the informational efficiency of the Indian Capital Market in the Semi-Strong Form of Efficient Market Hypothesis (EMH) with respect to select IT, FMCG, Banking, Capital Goods, and Automobile Sector companies.

### 3.4 Relevance of the Study

The investors use accounting information for valuation of securities. Accounting information and capital market efficiency are of great interest to the investors, fund managers, analysts, planners, policy makers, and market regulators, accounting standard setters, researchers, the Government and the public in general. Since 1998-99, SEBI has made it mandatory for all the listed companies to furnish the unaudited quarterly financial results within the month of expiry of the quarter to the stock exchange wherein the company is listed as one of the steps towards the creation of an efficient capital market. Do these quarterly earnings reports contain information relevant for valuation of securities? If so, do the security prices impound the information rapidly and unbiasedly? Thus, the present study is an attempt to test the informational efficiency of the Indian Capital Market with respect to quarterly earnings announced by the sample companies in the Semi-Strong Form of EMH.

## IV. Methodology of the Study

### 4.1 Sample Selection

The study intends to study only the IT, FMCG, Banking, Capital Goods, and Automobile Sector stocks listed in the National Stock Exchange (NSE). Out of all the companies in the above five sectors/industries listed in the NSE, only 84 companies, which satisfy the following criteria, were selected.

- i. The Indexed companies in NSE were chosen in order to ensure active trading, and for the availability of daily share price quotations,
- ii. Availability of the dates of announcement of quarterly earnings, and
- iii. Availability of quarterly earnings information

The present study is restricted to first and third quarter because, second quarter coincides with half yearly earnings and fourth quarter coincides with annual earnings. For some of the sample companies, the quarterly earnings information and / or the dates of announcement were not available. Finally the total number of quarterly earnings announcement considered for the study was 463 out of which 321 quarters had positive earnings change and 142 quarters had negative earnings change.

### 4.2 Sources of Data

The informations regarding adjusted closing share price, the quarterly earnings, the dates of quarterly earnings announcements, and the values of S&P CNX 500 were obtained from "PROWESS" published by CMIE. Other relevant information are also obtained from the NSE website (<http://www.nseindia.com/>), books, and journals.

#### 4.3 Period of the study

The period of the study covers five years from 2000-01 to 2004-05.

#### 4.4 Analytical Tools

##### 4.4.1 Daily Returns

The daily returns were calculated for both individual securities as well as market index using the following equation

$$R_{i,t} = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100 \quad (1.0)$$

where,  $R_{i,t}$  = Returns on Security  $i$  on time  $t$   
 $P_t$  = Price of the security at time  $t$   
 $P_{t-1}$  = Price of the security at time  $t-1$

##### 4.4.2 Security Returns Variability (SRV)

SRV model is used to know the reaction in the security prices to the announcement of an information item. Symbolically, the model is

$$SRV_{i,t} = \frac{AR_{i,t}^2}{V(AR)} \quad (1.1)$$

where,  $SRV_{i,t}$  = Security Returns Variability of security  $i$  in time  $t$   
 $AR_{i,t}$  = Abnormal returns on security  $i$  on day  $t$   
 $V(AR)$  = Variance of Abnormal Returns during the announcement period

Abnormal Returns (AR) under *market-adjusted abnormal returns* is calculated by using the equation as below;

$$AR_{i,t} = R_{i,t} - R_{m,t} \quad (1.2)$$

where,  $AR_{i,t}$  = Abnormal Returns on security  $i$  at time  $t$   
 $R_{i,t}$  = Actual returns on security  $i$  at time  $t$   
 $R_{m,t}$  = Actual returns on market index  $m$ , which is proxied by S&P CNX 500, a weighted average index of 500 companies published by NSE, at time  $t$ .

Thus, daily actual returns over the announcement period (41 days) were adjusted against their corresponding market returns.

##### 4.4.2.1 Average Security Returns Variability (ASRV)

The  $SRV_{i,t}$  so calculated for all the quarters are averaged to find the Average Security Returns Variability (ASRV) by using the following equation

$$ASRV_t = SRV_{i,t} \times (1/n) \quad (1.3)$$

Where,  $ASRV_t$  = Average Security Returns Variability at time  $t$   
 $SRV_{i,t}$  = Security Returns Variability  $i$  security at time  $t$   
 $n$  = Number of quarters in the sample

The significance of reaction in security prices ( $ASRV_t$ ) is tested using the T- statistics as follows:

$$t_{stat} = (ASRV - 1) \times \sqrt{n} / s \quad (1.4)$$

where,  $n$  is the number of quarters in the sample and  $s$  is the Standard Deviation of Abnormal Returns.

#### 4.4.3 Average Abnormal Returns (AAR)

The Average Abnormal Returns is calculated by equation given below

$$AAR_t = \frac{1}{n} \sum_{i=1}^n AR_{i,t} \quad (1.5)$$

where,  $AAR_t$  = Average Abnormal Returns on day  $t$   
 $AR_{i,t}$  = Abnormal Returns on security  $i$  at time  $t$  which is calculated by using the equation (1.2)  
 $n$  = Number of sample quarters

The significance of the AAR, is tested using the T- statistics as follows;

$$t_{stat} = AAR_t \times \sqrt{n} / s \quad (1.6)$$

where,  $AAR_t$  is the Average Abnormal Returns on time  $t$ ,  
 $n$  is the number of quarters in the sample and  
 $s$  is the Standard Deviation of Average Abnormal Returns.

4.4.4 Cumulative Average Abnormal Returns (CAAR / CAR) The CAAR / CAR is calculated as

$$CAAR_k = \sum_{t=1}^k AAR_t \quad (1.7)$$

where,  $CAAR_k$  = Cumulative Average Abnormal Returns for the  $k$  th period. (Hereafter, it is referred to as CAR),  
 $AAR_t$  = Average Abnormal Returns of sample quarters at time  $t$  which is calculated by using the equation (1.5)

#### 4.5. Terminologies used in the study

##### 4.5.1 Abnormal Returns

It is calculated as the excess returns earned by a stock over the benchmark portfolio. The benchmark portfolio used in the study is the S&P CNX 500 - an index of 500 companies listed on the National Stock Exchange. If the stock returns is greater than the returns from the benchmark portfolio (S&P CNX 500), it is called *positive abnormal returns* and if the difference is negative, it is called *negative abnormal returns*.

#### 4.5.2 Mean adjusted Abnormal Returns

It is the excess of actual returns from a security over its average returns, which is calculated for the period of three months preceding the announcement date.

#### 4.5.3 Risk-adjusted Abnormal Returns

It is the excess of actual returns over the normal returns calculated using the Capital Asset Pricing Model (CAPM).

#### 4.5.4 Market-adjusted Abnormal Returns

It is the excess of actual returns from a security over the returns from the market index.

#### 4.5.5 Announcement Date/Day

The date in which the board of directors approves the quarterly earnings reports, is considered to be the date of announcement of quarterly earnings.

#### 4.5.6 Announcement period

The announcement period is the period surrounding the announcement of quarterly earnings. This period includes 20 trading days before the day of the announcement, day of the announcement, and 20 trading days following the day of announcement. Thus, the announcement period has 41 days. The period starts from -20 and ends at 20. Day 0 is the day of the announcement. -20 to -1 is the pre-announcement period and 1 to 20 is the post announcement period.

#### 4.5.7 CAAR/CAR

CAR and CAAR are used interchangeably in the present study.

#### 4.5.8 Earnings Change

The difference between the net profit margin of a quarter and the net profit margin of the same quarter in the preceding year is called earnings change. If the net profit margin for the quarter is greater than the net profit margin of the same quarter in the preceding year, it is a *positive earnings change* and if it is smaller than the net profit margin of the same quarter in the preceding year, it is *negative earnings change*.

#### 4.5.9 Efficient Market

The present study tests the informational efficiency of the capital market. A market is said to be efficient if the securities traded on the market capture the contents of information in its prices rapidly and unbiasedly.

#### 4.5.10 Market Reaction

Market reaction is measured by the changes in the stock prices. If the prices increase, then it is called *positive reaction*. On the other hand, if the prices fall, it is called *negative reaction*.

#### 4.5.11 SRV

It is the acronym of Security Returns Variability. Security Returns Variability is the ratio of abnormal returns squared on a particular day to the variance of abnormal returns during the announcement period.

## V. Analysis of the Study

The analysis of this study is discussed in two parts as detailed below

Part I: Analysis of five sample industrial sectors- IT, FMCG, Banking, Capital Goods and Automobile Industry.

Part II: Analysis of entire sample companies.

For the purpose of analysis, the values of AAR+, AAR-, CAR+ and CAR- were separately calculated and used. Further, the average values of ASRV, AAR+ and AAR- were given in Tables VII, VIII and IX respectively. These values were referred to in the discussion wherever required.

### 5.1 Analysis of Five Sample Industrial Sectors

The investors may perceive different industries differently. Some industries may be considered to be fast growing and hence the stocks of that industry may be considered attractive investment avenue and hence the investors watch the prices closely. Therefore, many analysts and investors may forecast the earnings of these stocks and hence prices would capture information even before the announcement of the earnings information. Whereas some industries may not find favor with the investors in general and hence may react to any information only after the information is made available in the market. In order to examine if there is any difference in the reaction of different industrial sector stocks, the five sample industrial sectors, namely, Informational Technology (IT), Fast Moving Consumer Goods (FMCG), Banking, Capital Goods and Automobile Sector are discussed in the following pages.

#### 5.1.1 Results of Information Technology (IT) Industry

The IT sector stocks are more visible and highly active in the Indian capital market during the last decade. It is significant that during the year 2002-03, of the top 15 companies in terms of trading volume, 12 were IT companies. Therefore, one may expect that the IT stocks would be closely followed and the earnings of IT companies would be forecasted in advance. Hence, the market for IT stocks are expected to be more efficient compared to any other industrial sector.

##### 5.1.1.1 Average Security Returns Variability(ASRV)

In an informationally efficient market, on an average the ASRV is expected to be one. If the ASRV is greater than one (1), it may be said that there is significant reaction in the security prices (i.e. the market is not informationally efficient). Hence, it may be said that the information announced is relevant for valuing the securities and hence the prices of securities should react to the announcement.

Table I shows the values of ASRV with t-value for IT industry. It is inferred from the Table that the ASRV on day 0 was 1.63, 60 percent greater than the average, and on day 1 it was 3.24, which was 218 percent greater than the average. This shows that the security prices of sample IT companies reacted to the announcement of quarterly earnings on the next day (day 1)



to the day of quarterly earnings announcement. However, it should be noted that the average ASRV during the period of 41 days was 1.02. The average ASRV during the 20 pre announcement days was 1.01 and the average ASRV during post announcement period of 21 days was 1.02. The average ASRV during the period of 7 days (from day -3 to day 3), was 1.50. Hence, the prices of securities significantly reacted to the announcement, particularly during the few days surrounding the day of the announcement (day 0).

Table I  
Analysis of ASRV, AAR+, AAR-, CAR+ and CAR- of IT Industry

Days	ASRV	t-value	AAR+	t-value	AAR-	t-value	CAR+	CAR-
-20	0.67	-3.69	-0.10	-0.35	-0.68	-1.44*	0.03	-0.68
-19	1.20	0.89*	0.56	1.76*	-0.76	-1.32*	0.38	-1.44
-18	1.11	0.56*	-0.69	-2.70**	0.16	0.25	-0.44	-1.28
-17	0.82	-1.37	-0.46	-1.71	0.97	1.58*	-1.04	-0.30
-16	0.99	-0.06	-0.20	-0.55	0.46	1.04	-1.63	0.16
-15	1.21	0.88*	-0.21	-0.61	1.15	1.74**	-2.20	1.31
-14	0.86	-1.02	-0.38	-1.38	0.17	0.30	-2.74	1.49
-13	1.01	0.06*	0.16	0.49	-1.62	-2.73***	-2.76	-0.13
-12	1.39	1.25*	-0.06	-0.17	-0.33	-0.63	-2.93	-0.46
-11	0.78	-1.54	-0.45	-1.58	-0.02	-0.04	-3.49	-0.48
-10	1.42	0.83*	0.59	1.85*	0.31	0.59	-3.10	-0.17
-9	0.83	-1.24	0.02	0.10	-0.36	-0.77	-3.15	-0.52
-8	0.71	-2.60	-0.11	-0.49	-0.30	-0.58	-3.38	-0.82
-7	1.04	0.19*	-0.26	-0.82	-0.21	-0.38	-4.04	-1.03
-6	0.86	-1.05	0.38	1.11	-0.73	-1.60*	-3.91	-1.76
-5	1.23	0.97*	-0.46	-1.34	-0.91	-2.38***	-4.48	-2.66
-4	0.94	-0.46	-0.20	-0.71	0.19	0.42	-5.00	-2.47
-3	0.91	-0.69	0.25	0.80	-1.15	-3.15***	-5.06	-3.62
-2	1.16	0.83*	0.75	2.19**	-0.30	-0.74	-4.64	-3.92
-1	0.98	-0.21	-0.37	-1.24	-0.73	-2.02*	-5.10	-4.65
0	1.63	2.51**	-0.20	-0.57	-1.91	-3.10***	-5.51	-6.55
1	3.24	4.76***	0.01	0.01	-1.19	-1.09*	-5.75	-7.74
2	1.40	1.77**	0.09	0.29	0.09	0.12	-5.87	-7.65
3	1.17	1.01*	-0.67	-2.16**	-0.71	-1.16*	-6.30	-8.37
4	0.83	-1.39	0.19	0.67	-0.11	-0.23	-6.21	-8.47
5	0.94	-0.30	-0.25	-0.77	-0.02	-0.05	-6.46	-8.50
6	0.95	-0.31	-0.16	-0.57	-0.21	-0.40	-6.50	-8.70
7	0.70	-2.76	0.02	0.06	-0.21	-0.51	-6.51	-8.91
8	0.93	-0.56	-0.32	-1.26	-0.98	-2.26**	-6.73	-9.89
9	0.95	-0.21	0.14	0.41	-0.09	-0.20	-6.50	-9.98
10	0.70	-2.54	-0.40	-1.91	0.09	0.15	-6.66	-9.90
11	0.83	-1.34	-0.52	-2.25***	-0.34	-0.75	-6.93	-10.24
12	0.75	-1.91	-0.18	-0.80	-0.16	-0.34	-6.82	-10.40
13	0.65	-3.70	-0.13	-0.58	0.61	1.44*	-6.91	-9.79
14	0.63	-3.81	0.01	0.05	-0.11	-0.29	-6.83	-9.89
15	0.92	-0.37	0.47	2.02**	0.72	1.19*	-6.44	-9.17
16	0.86	-0.76	-0.16	-0.78	0.27	0.40	-6.60	-8.90
17	0.68	-3.39	-0.37	-1.82	0.47	0.81	-6.92	-8.44
18	1.13	0.39	0.44	1.45	0.16	0.43	-6.59	-8.28
19	0.71	-2.17	-0.25	-1.04	0.13	0.34	-6.97	-8.14
20	0.84	-1.08	0.00	0.00	-0.62	-1.61	-6.76	-8.76

Notes : \* 10% significant

\*\* 5% significant

\*\*\* 1% significant

Source: Computed from PROWESS

This is clearly depicted in Figure 1, which shows that the ASRV curve of IT Industry is steeply rising on day 0 and day 1. The days during which ASRV exceeded one during the pre announcement period are: -19, -18, -15, -12, -10, -7, -5, and -2. However, the sharp reaction on days immediately following the announcement of quarterly earnings shows that the market is not able to capture the information before its announcement. Therefore, the market for the I.T stocks may be said to be near efficient.

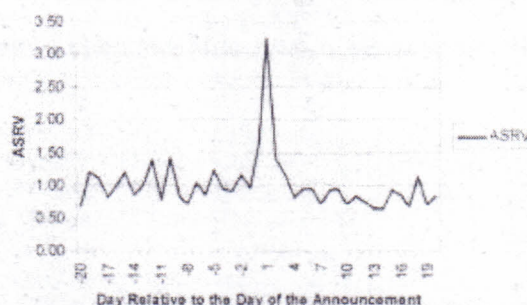


Figure 1  
Average Security Return Variability for the IT Industry

#### 5.1.1.2 Average Abnormal Returns(AAR)

The abnormal returns for 41 days during the announcement period for all samples companies were calculated for analysis. The abnormal returns so calculated were averaged to get the average abnormal returns (AAR). For the purpose of analysis, the Average Abnormal Returns (AARs) were calculated for positive earnings change (positive AAR) and negative earnings change (negative AAR) separately.

The results of positive AAR with t-values for the IT sector are given in Table I, which shows that on day -1, and on day 0, there was negative abnormal returns. On day -2 and day 2, which are closer to the announcement day, the abnormal returns were 0.75 and 0.09 respectively. The positive AAR from day -18 to -4, there has been negative abnormal returns. And, beyond day 4, there has been negative average abnormal returns generally. Thus, the reaction took place from day -2 to day 4 against positive quarterly earnings announcement. The average positive AAR of -0.09 was available during the announcement period of 41 days. During the pre announcement period, the average positive AAR was -0.06 and the average positive AAR was -0.11 during the post announcement period. In short, there was no significant abnormal returns available to the investors.

Table I also gives the AAR for the negative earnings change (negative AAR), which shows that there is a negative abnormal returns on most of the days during the announcement period. The average negative AAR during the announcement period of 41 days was -0.21. During the pre announcement period, the average negative AAR was -0.23 percent while the average negative AAR was -0.20 percent during the post announcement period.

### 5.1.1.3 Cumulative Abnormal Returns (CAR)

The CAR shows the relationship between the magnitude of earnings change and the magnitude of price change. The CAR model is useful in examining the informational efficiency of capital markets, since it shows the direction and magnitude of changes in the security prices to the announcement of an information item. The difference between the net profit margin of a quarter and the net profit margin of the same quarter in the preceding year is called earnings change.

The results of CAR of IT Industry are presented in Table I and depicted in the form of curve in Figure 2, which shows that the CAR for the positive earnings change has been negative throughout the announcement period. On the other hand, the CAR for the negative earnings change has fluctuated widely. There was a significant reaction for the positive earnings change on day -2. Thereafter the positive CAR stabilized with minor fluctuations. This shows that the market is able to capture the positive earnings informations before its announcement and hence the share prices were adjusted rapidly. The CAR value for negative earnings change shows that there has been negative CAR upto day -14 from day -20 and thereafter the negative CAR was recorded at -2.47 on day -4. Beyond day -4, the negative CAR was steadily decreasing. It reached -10.40 on day 12 and -8.76 on day 20. It is clear from this that the revision took place during the post announcement period. The results show that though the Indian capital market is able to analyse the quarterly earnings information and use it for revision of security prices, there is delay in their reaction.

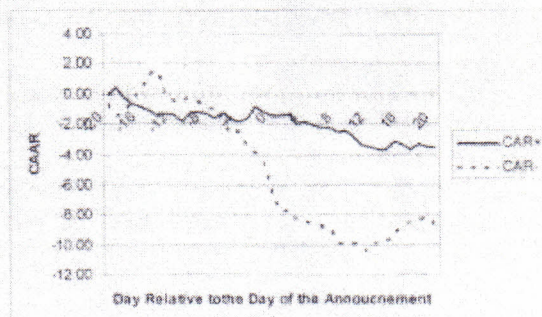


Figure 2

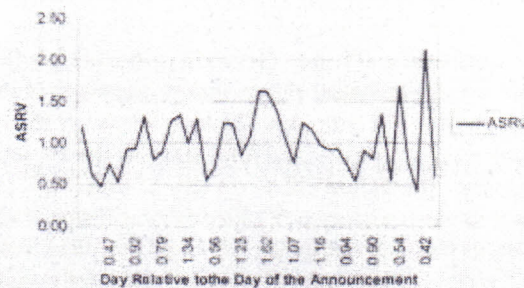
### Cumulative Average Abnormal Return (CAR) for the IT Industry

#### 5.1.2 Results of FMCG industry

##### 5.1.2.1 Average Security Returns Variability (ASRV)

Table II explains the results of ASRV pertaining to FMCG Sector. The results show that the FMCG stocks significantly reacted on days 0 and day 1. The ASRV stood at 1.62 on day 0 and day 1 as well. However, on days 5, 6, 14, 16, and 19, the ASRV was 1.25, 1.16, 1.35, 1.67, and 2.12 respectively. This proves that the reaction of prices was extended upto day 20. On an

average, the average ASRV during the 41 days of the announcement period was 1.01. However, the average ASRV during the pre announcement period of 20 days was 0.95 and the average ASRV during the post announcement period of 21 days was 1.08. Hence, there is a significant reaction during the post announcement period. The ASRV value was 2.12 on day 19 (the highest value of ASRV during the entire announcement period). The securities reacted for about 9 days during pre as well as post announcement period. But the magnitude of reaction was higher during the post announcement period. The same are depicted in the form of curve in Figure 3. The figure shows that the behavior of FMCG sector was erratic and significant reaction took place during the post announcement period. It is important to note that the results of FMCG sector compared to other sectors show that FMCG sector stocks behaved altogether in a different manner.



**Figure 3**  
Average Security Returns Variability for the FMCG Industry

#### 5.1.2.2 Average Abnormal Returns (AAR)

The results of the AAR for the FMCG sector stocks along with t-value are presented in Table II. On day 0, positive AAR stood at 0.47. It is interesting to note that there was an average positive AAR of 0.06 available during the announcement period of 41 days. During the pre as well as post announcement period, the average value was 0.06. But, the average abnormal returns during the period of 7 days (starting from day -3 to day 3) was 0.33. The analysis of negative AAR as given in above Table II indicates that there was negative abnormal returns on most of the days during the post announcement period. It should be noted that during the pre announcement period from day -14 to day -5, there was a consistent positive AAR. It is interesting to note that there was a consistent negative abnormal returns during the period of 20 days (from day -1 to day 20), except day 9, 10 and 16 where the negative AAR was 1.66, 0.96, and 1.55 respectively. The average negative AAR stood at -0.27 during the post announcement period and it was 0.54 during the pre announcement period. The average negative AAR during announcement period of 41 days was 0.13.

**Table II**  
**Analysis of ASRV, AAR+, AAR-, CAR + and CAR - of FMCG Industry**

Days	ASRV	t-value	AAR+	T-value	AAR-	T-value	CAR+	CAR-
-20	1.19	0.55*	-0.19	-0.18	1.04	0.97*	-0.19	1.04
-19	0.63	-1.93	-0.09	-0.12	-1.36	-1.69*	-0.28	-0.32
-18	0.47	-3.61	0.16	0.18	0.11	0.26	-0.12	-0.21
-17	0.74	-1.12	-0.61	-0.78*	-0.70	-1.09*	-0.73	-0.90
-16	0.53	-3.07	0.42	0.61	-0.31	-0.94	-0.31	-1.21
-15	0.92	-0.41	-0.32	-0.36	-0.03	-0.04	-0.63	-1.25
-14	0.93	-0.21	-0.08	-0.08	0.29	0.53	-0.71	-0.96
-13	1.32	0.52*	1.06	1.14*	1.76	1.68*	0.35	0.79
-12	0.79	-0.71	0.09	0.11	1.33	0.80*	0.44	2.12
-11	0.90	-0.33	0.15	0.19	1.08	0.85*	0.60	3.20
-10	1.26	0.59*	-0.21	-0.32	2.69	1.27*	0.38	5.89
-9	1.34	1.07*	-0.27	-0.27	1.53	2.17**	0.12	7.42
-8	1.00	0.01*	0.59	0.45*	0.96	0.69*	0.71	8.38
-7	1.30	0.96*	0.52	0.35*	0.26	0.40	1.23	8.64
-6	0.56	-2.69	0.36	0.55	0.25	0.25	1.59	8.88
-5	0.72	-1.10	-0.22	-0.22	0.81	1.74*	1.37	9.70
-4	1.24	0.63*	-0.19	-0.16	-0.12	-0.13	1.18	9.58
-3	1.23	0.87*	0.67	0.72*	1.21	0.89*	1.85	10.79
-2	0.85	-0.61	0.07	0.08	-0.66	-1.06*	1.91	10.13
-1	1.08	0.19*	-0.63	-0.70*	0.75	0.67*	1.28	10.88
0	1.62	1.27*	0.47	0.44*	0.08	0.13	1.75	10.96
1	1.62	1.54*	1.21	0.89*	-0.51	-0.44*	2.96	10.45
2	1.42	1.06*	0.46	0.46*	-2.77	-3.95***	3.42	7.68
3	1.07	0.26*	0.08	0.10	-1.72	-2.54**	3.51	5.96
4	0.76	-1.30	-0.44	-0.59	-0.30	-0.58	3.07	5.66
5	1.25	0.49*	0.34	0.36	-0.01	-0.01	3.41	5.65
6	1.16	0.44*	-0.33	-0.37	-0.01	-0.01	3.08	5.64
7	0.98	-0.08	-0.34	-0.35	-0.27	-0.52	2.73	5.37
8	0.93	-0.23	0.81	0.61*	-0.56	-0.80*	3.54	4.80
9	0.94	-0.30	0.74	0.95*	1.66	1.73*	4.28	6.46
10	0.76	-1.23	-0.54	-0.73*	0.96	0.93*	3.75	7.42
11	0.54	-3.20	-0.03	-0.05	-0.95	-2.47*	3.71	6.47
12	0.90	-0.43	0.27	0.27	-0.21	-0.75	3.99	6.26
13	0.80	-1.17	-0.23	-0.34	0.08	0.08	3.76	6.35
14	1.35	0.37*	-0.27	-0.23	-0.24	-0.76	3.48	6.11
15	0.54	-3.21	-0.21	-0.30	-0.34	-0.64	3.28	5.77
16	1.67	0.79*	0.01	0.01	1.55	1.47*	3.28	7.32
17	0.78	-0.67	-0.03	-0.03	-0.66	-1.07*	3.25	6.66
18	0.42	-3.49	-0.33	-0.53	-0.57	-1.49*	2.92	6.09
19	2.12	1.42*	-0.25	-0.15	-0.48	-0.35*	2.67	5.62
20	0.60	-2.03	-0.03	-0.03	-0.37	-0.56	2.64	5.25

Note: \* 10% significant,

\*\* 5% significant,

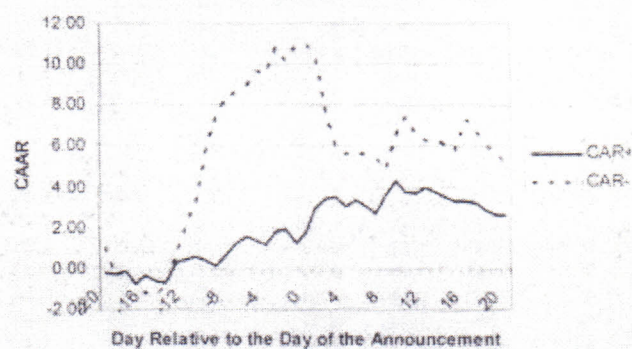
\*\*\* 1% significant

Source: Computed from PROWESS

### 5.1.2.3 Cumulative Abnormal Returns(CAR)

The results of CAR for FMCG sector are also exhibited in Table II and depicted in Figur 4. The positive CAR started to rise on day -14 with -0.71 and started to fall from day 9 after reaching as high as 4.28 on day 9 and ended with 2.64 on day 20. Thus the CAR for the positive earnings change was negative during the early pre announcement period and it steadily

increased to 4.28 on day 9. Then it declined to the level of 2.64 on day 20. Thus, nearly 51.52 %  $[(2.64-1.28) / 2.64] \times 100$  of the returns content of positive quarterly earnings information were captured after announcement. CAR for the negative earnings change was negative during the early pre announcement period and then it became positive. There was a sharp fall in the negative CAR on day 2, where the negative CAR was 7.68 and it was 10.45 on the previous day (day 1). The negative CAR reached the highest of 10.96 on day 0 and thereafter it declined to reach 5.25 on day 20. The result shows that the market revised the share prices after the announcement.

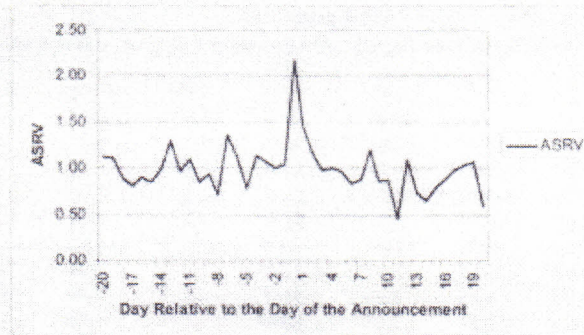


**Figure 4**  
Cumulative Abnormal Returns for the FMCG Industry

### 5.1.3 Results of Banking Industry

#### 5.1.3.1 Average Security Returns Variability (ASRV)

Table III reveals the values of ASRV with t-values for banking sector. It is understood that the ASRV on day 1 was 2.18, (122 percent greater than the average), and it indicates that the market reacted to the announcement of quarterly earnings. It is interesting to note that the reaction of share price took place consistently from day -4 to day 2. During the period of 7 days from day -4 to day 2, the ASRV value stood at 1.13, 1.07, 1.00, 1.04, 1.46, 2.18 and 1.16 respectively. The results of ASRV for Banking Industry are presented in the form of curve in Figure 5, which shows that the ASRV curve steeply rose on day 1. However, the average ASRV during the period of 41 days was 1.00. That is, the average ASRV during 41 days arrived at the neutral value of ASRV (i.e. 1). During the period of pre announcement period, the average ASRV was 0.99 while the average ASRV during the post announcement period was 1.01. But during the period of 7 days (from day -3 to day 3), the average ASRV was 1.42. Thus, the reaction took place for few days surrounding the day 0.



**Figure 5**  
Average Security Returns Variability for the Banking industry

#### 5.1.3.2 Average Abnormal Returns (AAR)

The results of the AAR for the banking sector stocks along with t-value are given in Table III. The positive abnormal returns of any one day from day-11 to day-1 were followed by the negative abnormal returns on the very next day. On day 0, the positive AAR available to investors stood at 1.27 (highest abnormal returns available during the period of 21 days starting from day -10 to day 10).

This was followed by consistent negative abnormal returns until day 3. Beyond day 0, the significant positive AAR were available on day 5 (1.15), day 7 (1.15), day 12 (1.05), and day 14 (1.75). On an average, 0.21 of positive AAR was available during the announcement period of 41 days. While the average abnormal returns during the post announcement period of 21 days was 0.16, the average abnormal returns during the pre announcement period of 20 days was 0.27.

The average abnormal returns during the period of 7 days (starting from day-3 to day 3) was 0.08. The value of negative AAR indicates that there was negative abnormal returns on most of the days during the post announcement period. It is important to note that there was a consistent positive AAR during the period from day -4 to day 4, except day 0 where the negative AAR was -2.34. It is inferred that during the announcement period of 41 days, the average negative AAR was 0.03.

The average negative AAR stood at -0.06 during the pre announcement period but it was 0.13 during the post announcement period. The average negative AAR of 0.11 was available during the period of 7 days (from day -1 to day 3). Thus, the reaction took place after the announcement of negative earnings. The results show that the Indian capital market has the positive outlook for the banking stocks. Therefore, the market reacts positively even for the negative earnings announced by the banking companies.

Table III  
Analysis of ASRV, AAR+, AAR-, CAR+ and CAR- of Banking Industry

Days	ASRV	t-value	AAR+	t-value	AAR-	t-value	CAR+	CAR-
-20	1.12	0.54*	-0.46	-1.60**	0.38	0.56	-0.46	0.38
-19	1.10	0.39**	1.68	2.78***	0.66	0.98*	1.22	1.04
-18	0.89	-0.67	-0.96	-2.93***	0.57	0.69*	0.27	1.61
-17	0.81	-1.72	0.05	0.13	-1.00	-1.48**	0.31	0.61
-16	0.90	-0.50	-0.29	-0.71*	0.79	0.71	0.03	1.41
-15	0.84	-1.00	1.08	2.31***	0.39	0.57	1.11	1.79
-14	0.98	-0.12	0.02	0.04	-0.58	-1.12**	1.12	1.22
-13	1.29	0.99**	0.87	2.29**	1.11	1.38**	2.00	2.33
-12	0.96	-0.24	1.44	4.26***	-1.43	-2.26***	3.43	0.90
-11	1.09	0.34*	1.21	2.88***	0.69	1.17**	4.65	1.59
-10	0.85	-0.89	-0.41	-1.17**	1.24	1.80**	4.23	2.83
-9	0.94	-0.36	0.03	0.08	0.73	0.76*	4.26	3.56
-8	0.70	-2.14	-0.10	-0.26	-0.84	-1.56**	4.16	2.72
-7	1.36	1.15**	0.39	0.87*	-2.32	-3.21***	4.55	0.40
-6	1.12	0.65*	-0.10	-0.21	1.11	1.06**	4.45	1.51
-5	0.78	-1.84	0.49	1.17**	-1.38	-2.82***	4.94	0.13
-4	1.13	0.61**	-0.48	-1.15**	0.68	0.59*	4.47	0.80
-3	1.07	0.34*	0.89	2.00***	1.14	1.84**	5.35	1.94
-2	1.00	-0.01	-0.02	-0.05	0.62	0.76*	5.33	2.56
-1	1.04	0.14*	0.08	0.20	0.03	0.06	5.41	2.59
0	1.46	1.60**	1.27	2.44***	-2.34	-2.20***	6.68	0.25
1	2.18	2.69***	-0.51	-1.58**	0.75	0.89*	6.18	1.00
2	1.16	0.70*	-0.94	-2.25***	0.09	0.13	5.24	1.09
3	0.98	-0.11	-0.20	-0.53	0.48	0.58*	5.03	1.57
4	1.01	0.04**	0.64	1.32**	0.32	0.52*	5.67	1.89
5	0.97	-0.16	1.15	4.75***	-0.96	-1.45**	6.83	0.93
6	0.84	-1.06	-0.01	-0.04	-0.01	-0.02	6.82	0.92
7	0.88	-0.55	1.15	2.55***	1.41	2.54***	7.96	2.34
8	1.20	0.74**	-0.73	-1.95**	0.59	1.26**	7.24	2.92
9	0.86	-0.73	-0.49	-1.65*	-0.10	-0.21	6.75	2.83
10	0.87	-0.75	-0.52	-1.18**	0.13	0.33	6.23	2.96
11	0.46	-6.59	0.23	0.74	0.19	0.52	6.45	3.15
12	1.10	0.36*	1.05	1.54**	-0.40	-0.68*	7.51	2.76
13	0.73	-1.48	0.54	0.95	-0.72	-1.43**	8.04	2.04
14	0.65	-1.52	1.75	3.22***	-0.04	-0.11	9.79	2.00
15	0.79	-1.27	0.01	0.01	-0.97	-2.02***	9.79	1.03
16	0.88	-0.73	-0.73	-1.71**	0.32	0.70*	9.06	1.35
17	0.98	-0.06	-0.24	-0.89	0.26	0.28	8.82	1.61
18	1.02	0.07**	0.46	1.36*	-0.11	-0.23	9.28	1.49
19	1.07	0.34*	0.02	0.05	-0.90	-1.08**	9.31	0.60
20	0.59	-3.98	-0.60	-1.92***	0.64	0.90*	8.70	1.23

Note: \* significant at 10%

\*\* significant at 5%

\*\*\* significant at 1%

Source: Computed from "PROWESS" a corporate database.

### 5.1.3.3 Cumulative Abnormal Returns (CAR)

The results of CAR for banking sector are presented in Table III. It is observed that the positive earnings announcement leads to 8.70 percent returns in excess of S&P CNX 500. On day 0, the positive CAR reached to



6.68 and thereafter it declined to 5.03 on day 3. The positive CAR reached as high as 9.79 on day 14 and 15 and it ended with 8.70 on day 20. Hence, it is understood from this that 37.93 percent  $[(8.7-5.41) / 8.7] \times 100$  of the returns content of quarterly earnings informations was reaped after its announcement. In contrast to this, the negative CAR had undergone a greater volatility in the security prices. The negative CAR was as low as 0.25 on day 0 and as high as 3.15 on day 11. After day 11, the negative CAR decreased to 1.23 on day 20. The positive and negative CAR of banking industry are given in the form of curves in Figure 6

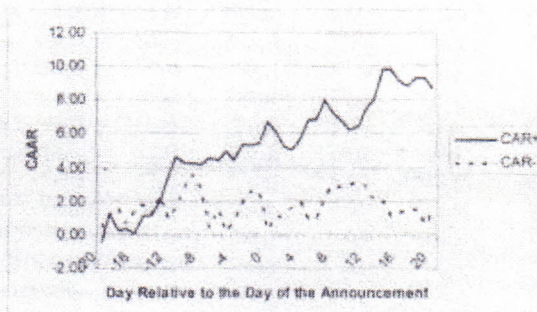


Figure 6  
Cumulative Average Abnormal Returns (CAR)  
for the Banking industry

#### 5.1.4 Results of Capital Goods industry

##### 5.1.4.1 Average Security Returns Variability (ASRV)

The results of ASRV for capital goods industry are shown in Table - 4. The capital goods stocks reacted significantly on day one where the ASRV is 2.14, which is 114 percent greater than the average. It should be noted that there was a continuous reaction in the security prices from day 0 to day 4.

This apart, the ASRV is significantly higher than one on days during the pre announcement period [day -17 (1.39), day -15 (1.16), day -14 (1.13), day -13 (1.19), day -12 (1.27), day -11 (1.19), day -4 (1.16)] and during the post announcement period [day 8 (1.12), day 9 (1.13), day 19 (1.10)]. On an average, the average ASRV during the 41 days of the announcement period was 0.99. However, the average ASRV during the pre announcement period of 20 days was 1.00 and during the post announcement period of 21 days was 0.98.

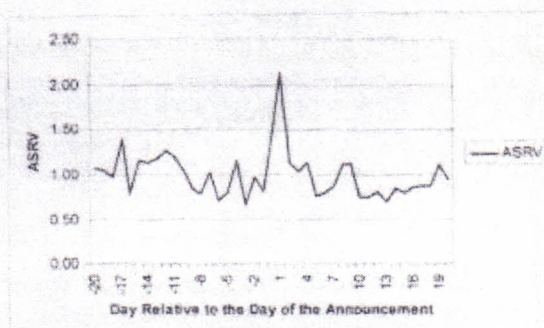
However, during the period of 7 days (from day -3 to day 3), the average ASRV was 1.18. The same is represented in the form of curve in Figure 7, which shows that there is a sharp reaction in the share prices on day 0, and on day 1. There was minor reaction in the later part of announcement period (from day 3 to day 15) it was -0.28.

Table IV  
Analysis of ASRV, AAR+, AAR-, CAR + and CAR -  
of Capital Goods Industry

Days	ASRV	t-value	AAR+	t-value	AAR-	t-value	CAR +	CAR-
-20	1.07	0.46*	0.03	0.10*	0.19	0.37*	0.03	0.19
-19	1.04	0.25*	-0.01	-0.04*	0.77	1.49*	0.02	0.97
-18	0.97	-0.18*	-0.29	-0.90*	-0.34	-0.74*	-0.27	0.63
-17	1.39	1.42*	0.70	1.52*	0.66	1.02*	0.43	1.28
-16	0.79	-2.31***	-0.49	-1.67**	-0.11	-0.25*	-0.06	1.17
-15	1.16	0.67*	0.31	0.77*	0.57	1.00*	0.25	1.74
-14	1.13	0.71*	0.44	1.09*	0.11	0.26*	0.69	1.85
-13	1.19	0.60*	0.27	0.75*	0.42	0.86*	0.95	2.27
-12	1.27	1.00*	0.19	0.46*	-0.89	-1.78**	1.14	1.38
-11	1.19	0.92*	0.34	0.78*	0.58	1.12*	1.49	1.96
-10	1.03	0.15*	-0.34	-1.02*	0.48	0.69*	1.15	2.44
-9	0.84	-1.00*	0.46	1.64*	0.25	0.61*	1.61	2.69
-8	0.79	-1.99**	-0.19	-0.63*	-0.23	-0.53*	1.42	2.46
-7	1.02	0.12*	0.23	0.79*	-0.16	-0.28*	1.65	2.30
-6	0.71	-2.69***	-0.31	-1.15*	0.99	1.57*	1.34	3.29
-5	0.79	-1.66**	-0.57	-1.94**	0.98	1.66*	0.76	4.27
-4	1.16	0.77*	1.16	3.28***	-0.27	-0.65*	1.92	4.00
-3	0.67	-2.30***	0.25	0.85*	-0.06	-0.17*	2.17	3.94
-2	0.97	-0.17*	-0.24	-0.90*	0.40	0.63*	1.93	4.34
-1	0.81	-1.36*	0.28	1.05*	0.41	0.62*	2.21	4.75
0	1.53	2.17@	0.39	1.08*	-0.04	-0.05*	2.60	4.71
1	2.14	3.96***	-0.17	-0.36*	-2.27	-4.03***	2.43	2.44
2	1.14	0.76*	-0.10	-0.31*	-0.52	-1.13*	2.33	1.93
3	1.03	0.16*	0.14	0.44*	0.14	0.31*	2.47	2.06
4	1.13	0.71*	-0.51	-1.78**	1.01	1.40*	1.96	3.08
5	0.76	-2.25***	-0.27	-1.00*	-0.02	-0.05*	1.70	3.05
6	0.79	-1.30*	0.43	1.38*	0.10	0.26*	2.12	3.16
7	0.87	-0.83*	0.05	0.17*	0.40	0.91*	2.17	3.55
8	1.12	0.65*	0.40	0.99*	0.94	1.22*	2.57	4.50
9	1.13	0.53*	0.36	0.87*	0.59	0.80*	2.94	5.08
10	0.75	-2.10***	0.60	1.89**	-0.27	-0.64*	3.53	4.82
11	0.74	-2.52	0.02	0.07*	0.44	0.72*	3.55	5.26
12	0.80	-1.87**	0.39	1.53*	0.83	1.25*	3.94	6.09
13	0.69	-2.80***	0.02	0.09*	0.21	0.50*	3.97	6.30
14	0.84	-1.04*	0.21	0.81*	0.76	1.46*	4.18	7.06
15	0.80	-1.33*	0.24	0.85*	-0.90	-2.29***	4.42	6.16
16	0.86	-1.03*	0.49	1.31*	-0.24	-0.58*	4.91	5.92
17	0.86	-0.86*	-0.26	-0.86*	0.83	1.26*	4.65	6.75
18	0.87	-0.90*	0.35	1.12*	-0.04	-0.10*	5.01	6.70
19	1.10	0.49*	0.32	0.82*	0.04	0.07*	5.33	6.74
20	0.95	-0.35*	-0.24	-0.84*	0.23	0.44*	5.09	6.97

Notes \* significant at 10%,  
\*\* significant at 5%,  
\*\*\* significant at 1%

Source: Computed from "PROWESS", a corporate database.



**Figure 7**  
Average Security Returns Variability for the Capital Goods industry

#### 5.1.4.2 Average Abnormal Returns (AAR)

The results of the AAR for the capital goods industry stocks along with t-value are presented in Table V, which shows that from day-20 to day 20, generally, there were positive AAR available to the investors. On day 0, the positive AAR was 0.39. It is understood that there was a consistent negative abnormal returns from day 1 to day 5 except day 3, where the abnormal returns was 0.14. On an average, 0.12 of positive AAR was available during the announcement period of 41 days. While the average positive AAR during the post announcement period was 0.14, the average positive AAR during the pre announcement period was 0.11. The average positive AAR during the period of 7 days (from day-3 to day 3) was 0.08. Hence, it may be said that the market for the positive earnings announced by the capital goods sector was near efficient. As far as negative AAR is concerned, there was negative AAR on most of the days during the post announcement period. There was significant negative AAR of -2.27 on day 1. The average negative AAR stood at 0.11 during the post announcement period. The average negative AAR during the announcement period of 41 days was 0.17 but it was 0.24 during the pre announcement period and for the period of 7 days (from day -3 to day 3).

#### 5.1.4.3 Cumulative Abnormal Returns (CAR)

The results of CAR for Capital Goods Sector are exhibited in Table V and depicted in Figure 8. The positive CAR remained positive throughout the announcement period of 41 days except day -18 and day -16 where the positive CAR value was -0.27 and -0.06 respectively. It is observed that the positive CAR steadily increased with minor fluctuations during the announcement period of 41 days. On day 0, the positive CAR reached 2.60. The positive CAR started to rise from day -15 with 0.25 and reached as high as 5.33 on day 19 and ended with 5.09 on day 20. It should be noted that there was a significant decrease of positive CAR to reach 1.70 on day 5 from 2.60 on day 0. Thus, 56.58 percent  $\left[ \frac{(5.09 - 2.21)}{5.09} \times 100 \right]$  of the abnormal returns were captured after the announcement of positive earnings

Table V  
Analysis of ASRV, AAR+, AAR-, CAR + and CAR - of  
Automobile Industry

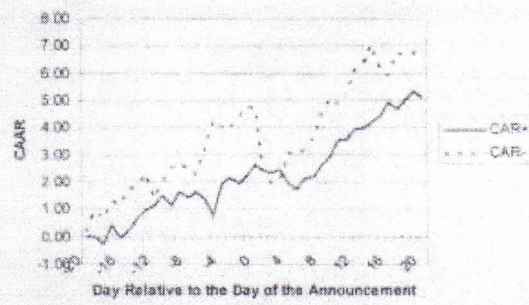
Days	ASRV	t-value	AAR+	t-value	AAR-	t-value	CAR+	CAR-
-20	1.05	0.37*	0.13	0.46	0.06	0.13	0.13	0.06
-19	0.84	-1.19	0.09	0.36	-0.29	-0.62	0.22	-0.23
-18	1.10	0.50*	-0.29	-1.21	1.07	1.67*	-0.07	0.84
-17	0.84	-1.11	-0.32	-1.10	-0.27	-0.88	-0.39	0.57
-16	0.91	-0.64	0.25	0.91	-0.18	-0.51	-0.14	0.40
-15	0.90	-0.76	0.07	0.25	0.46	1.13*	-0.07	0.85
-14	0.95	-0.31	0.30	1.08	-0.54	-2.25***	0.22	0.31
-13	0.89	-0.51	0.06	0.30	0.50	1.00*	0.29	0.81
-12	0.89	-0.70	0.02	0.09	0.38	1.08	0.31	1.19
-11	1.05	0.22*	0.49	1.48*	0.13	0.21	0.80	1.32
-10	0.87	-0.82	-0.12	-0.43	0.66	1.08*	0.68	1.98
-9	0.76	-2.26	0.10	0.39	-0.24	-0.75	0.78	1.74
-8	1.07	0.27*	0.27	1.21	0.99	1.69**	1.05	2.73
-7	1.17	0.77*	0.07	0.24	0.16	0.37	1.12	2.89
-6	0.89	-0.69	0.25	0.83	-0.10	-0.26	1.37	2.78
-5	0.92	-0.65	-0.07	-0.25	-0.28	-0.82	1.30	2.50
-4	0.89	-0.76	-0.39	-1.63	0.12	0.22	0.90	2.62
-3	1.28	1.31*	0.61	1.87**	-0.19	-0.34	1.52	2.43
-2	1.10	0.68*	0.33	1.04	-0.52	-1.20*	1.84	1.91
-1	0.94	-0.42	-0.03	-0.10	-0.27	-0.77	1.82	1.64
0	1.76	3.14@	0.44	1.19	-1.19	-2.53***	2.26	0.45
1	1.74	3.37@	-0.25	-0.73	-1.01	-1.74**	2.01	-0.56
2	1.37	2.11**	0.32	0.86	-0.59	-1.51*	2.33	-1.15
3	1.44	1.73**	0.47	1.45*	0.30	0.45	2.81	-0.85
4	1.49	2.03**	0.13	0.35	0.57	1.30*	2.94	-0.28
5	0.78	-1.60	0.24	0.86	0.38	1.07	3.18	0.10
6	0.75	-2.02	0.03	0.12	-0.09	-0.29	3.21	0.02
7	0.82	-1.36	-0.17	-0.69	0.39	1.07	3.04	0.41
8	0.99	-0.07	-0.25	-0.88	0.43	1.11	2.79	0.84
9	1.00	-0.02*	0.41	1.18	0.90	2.49***	3.20	1.75
10	0.92	-0.58	0.40	1.26	-0.31	-0.79	3.60	1.43
11	1.05	0.31*	0.00	0.00	-0.32	-0.83	3.60	1.11
12	0.75	-2.29	0.01	0.03	0.13	0.39	3.61	1.25
13	0.73	-2.44	-0.35	-1.50	-0.64	-1.67	3.26	0.61
14	0.81	-1.42	-0.05	-0.21	0.25	0.58	3.22	0.86
15	0.52	-7.04	-0.25	-1.14	-0.20	-0.64	2.97	0.65
16	0.75	-1.92	0.18	0.69	0.05	0.12	3.15	0.70
17	0.79	-1.57	0.01	0.04	0.09	0.23	3.16	0.79
18	0.73	-2.32	-0.10	-0.38	-1.05	-3.80	3.06	-0.26
19	0.83	-1.08	-0.47	-1.76**	-0.77	-1.98**	2.59	-1.03
20	0.97	-0.21	-0.06	-0.23	-0.05	-0.10	2.53	-1.08

Notes: \* significant at 10%,  
\*\* significant at 5%,  
\*\*\* significant at 1%

Source: Computed from "PROWESS", a corporate database.

information. As inferred from above Table V, the negative CAR was also positive during the entire announcement period. The negative CAR decreased to 2.44 on day 1 from 4.71 on day 0, and decreased further to 1.93 on day 2. After day 2, negative CAR started to rise, and it reached 7.06 on day 14. But it decreased to 5.92 on day 16 from 6.16 on day 15. The negative

CAR ended with 6.97 on day 20. Thus, only 31.85 percent  $[(6.97-4.75) / 6.97] \times 100$  of the abnormal returns were captured after announcement of negative earnings. Hence, an investor acting upon the announcement of quarterly earnings information can make 2.49 percent excess returns (i.e.  $5.09 - 2.60$ ) by acting upon positive earnings information and 2.26 percent ( $6.97 - 4.71$ ) excess returns by acting upon negative earnings information.

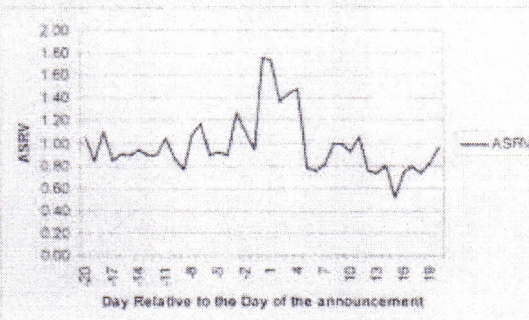


**Figure 8**  
Cumulative Average Abnormal Returns (CAR) for Capital Goods industry

5.1.5 Results of Automobile Industry

5.1.5.1 Average Security Returns Variability (ASRV)

The results of ASRV for the Automobile Industry are displayed in Table V. The result shows that there was a significant reaction in the security prices from day 0 to day 4. The ASRV was 1.76, 1.74, 1.37, 1.44, and 1.49 respectively on those days. The above Table also shows that the ASRV was greater than one on days -3, -2 and 11. It is important to note that on an average, the average ASRV during the 41 days of the announcement period was 0.99. However, the average ASRV during the pre announcement period was 1.00 and the average during the post announcement period was 0.98. The same are presented in the form of curve in Figure 9, which shows that there has been reaction in the automobile stocks prior to the announcement of quarterly earnings as well as after the announcement.



**Figure 9**  
Average Security Return Variability for the Automobiles industry

## 5.1.5.2 Average Abnormal Returns (AAR)

The results of the AAR with t-value for the automobiles sector are presented in Table-VI. The results show that there has been mixed reaction in the prices of stocks of the Automobile Sector to the announcement of quarterly earnings. That is, the Automobile Sector earned significantly positive as well as negative abnormal returns for both positive and negative earnings change. The positive AAR shows that from day-20 to day-1, generally, there were positive abnormal returns available to the investors.

Table VI  
Analysis of ASRV, AAR+, AAR-, CAR + and CAR - of Entire Sample

Days	ASRV	t-value	AAR+	t-value	AAR-	t-value	CAR+	CAR-
-20	0.95	-0.74	0.00	0.03	-0.10	-0.39	0.00	-0.10
-19	1.03	0.30*	0.60	3.76***	-0.15	-0.51	0.60	-0.25
-18	1.01	0.13*	-0.61	-4.51***	0.33	1.02	-0.01	0.08
-17	0.95	-0.54	-0.42	-2.59	0.32	1.11	-0.43	0.40
-16	0.89	-1.45	-0.13	-0.82	0.13	0.57	-0.56	0.53
-15	1.05	0.51*	-0.09	-0.52	0.70	2.34**	-0.65	1.24
-14	0.96	-0.43	-0.30	-1.93	-0.10	-0.41	-0.95	1.14
-13	1.07	0.63*	0.35	2.24	-0.17	-0.57	-0.60	0.97
-12	1.15	1.14*	0.11	0.66	-0.30	-1.18	-0.48	0.66
-11	0.99	-0.08	-0.20	-1.15	0.27	1.01	-0.68	0.93
-10	1.10	0.56*	0.38	2.50	0.61	1.90**	-0.29	1.55
-9	0.85	-2.09	-0.01	-0.09	-0.02	-0.08	-0.30	1.53
-8	0.84	-2.00	-0.02	-0.17	0.09	0.34	-0.33	1.62
-7	1.13	1.15*	-0.09	-0.57	-0.24	-0.86	-0.42	1.38
-6	0.86	-2.12	0.32	2.10	0.07	0.25	-0.09	1.45
-5	0.96	-0.41	-0.33	-2.04	-0.22	-0.95	-0.42	1.22
-4	1.02	0.23*	-0.23	-1.53	0.08	0.31	-0.65	1.31
-3	0.99	-0.17	0.37	2.38	-0.34	-1.45	-0.28	0.97
-2	1.07	0.75*	0.58	3.60***	-0.12	-0.48	0.30	0.85
-1	0.94	-0.78	-0.36	-2.47	-0.20	-0.82	-0.06	0.65
0	1.72	2.35***	0.04	0.21	-1.19	-3.56***	-0.02	-0.54
1	2.27	2.56***	0.11	0.47	-1.23	-2.79***	0.09	-1.78
2	1.30	2.93***	0.03	0.17	-0.36	-1.17	0.12	-2.14
3	1.18	1.76**	-0.52	-3.22***	-0.15	-0.49	-0.41	-2.29
4	1.09	0.99*	0.16	0.98	0.40	1.42	-0.25	-1.89
5	0.88	-1.51	-0.02	-0.16	0.02	0.10	-0.27	-1.87
6	0.86	-1.92	-0.16	-1.16	-0.07	-0.32	-0.44	-1.94
7	0.81	-2.76	0.09	0.65	0.24	1.11	-0.34	-1.70
8	1.02	0.30*	-0.22	-1.34	0.05	0.17	-0.57	-1.65
9	0.99	-0.09	0.15	0.84	0.43	1.59	-0.42	-1.23
10	0.80	-3.22	-0.43	-3.03	-0.08	-0.34	-0.85	-1.31
11	0.80	-2.96	-0.38	-2.90	-0.12	-0.47	-1.23	-1.43
12	0.82	-2.68	0.01	0.06	0.16	0.59	-1.22	-1.27
13	0.70	-2.44	-0.07	-0.56	0.03	0.15	-1.29	-1.24
14	0.76	-2.96	0.16	1.22	0.22	0.97	-1.13	-1.03
15	0.75	-3.07	0.33	2.56	-0.12	-0.48	-0.80	-1.15
16	0.87	-1.45	-0.20	-1.43	0.13	0.44	-1.00	-1.02
17	0.80	-2.72	-0.31	-2.39	0.40	1.36	-1.31	-0.63
18	0.92	-0.67	0.34	2.22	-0.29	-1.49	-0.97	-0.92
19	0.95	-0.57	-0.22	-1.42	-0.25	-1.06	-1.19	-1.17
20	0.85	-2.02	-0.07	-0.48	-0.13	-0.56	-1.26	-1.30

Notes: \* significant at 10%,

\*\* significant at 5%,

\*\*\* significant at 1%

Source: Computed from "PROWESS", a corporate database.

On day 0, positive AAR was 0.44. On an average, abnormal returns of 0.06 was available during the announcement period of 41 days. While the average abnormal returns during the post announcement period of 21 days was 0.03, the average abnormal returns during the pre announcement period of 20 days was 0.09. Further, the average abnormal returns during the period of 7 days (from day -3 to day 3) were 0.27. The results of negative AAR indicate that there was negative abnormal returns on most of the days during the post announcement period. It is interesting to note that there was a consistent negative AAR during the period of 9 days (from day -6 to day 2), except day -4 where the negative AAR was 0.12. The average negative AAR during announcement period of 41 days was -0.02. The average negative AAR stood at -0.13 during the post announcement period and it was 0.08 during the pre announcement period. But the average abnormal returns during the period of 7 days (from day -3 to day 3) were -0.51. Even though there have been mixed reaction, the automobiles stocks reacted positively to the positive earnings change and negatively to the negative earnings change on days closely around the day of the announcement.

#### 5.1.5.3 Cumulative Abnormal Returns(CAR)

The results of CAR for Automobile Sector are given in Table V. It is observed that the positive CAR steadily increased with minor fluctuations during the announcement period of 41 days. On day 0, the positive CAR reached 2.26. The positive CAR started to rise from day -14 with 0.22 and reached as high as 3.61 on day 12 and came to an end on day 20 with the value of 2.53. Hence, the market was unable to capture 28.06  $[(2.53-1.82) / 2.53] \times 100$  of the returns content of positive earnings before the announcement. Hence, an investor acting upon positive earnings information, can make 2.70 percent excess returns by acting upon this information for the period of 15 days (from day -4 to day 10). In contrast to this, the negative CAR had undergone a wider fluctuation. The negative CAR was as low as 0.45 on day 0 and as high as 2.89 on day -7. After day -7, the value of negative CAR decreased to reach as low as -1.15 on day 2. After day 2, negative CAR started to rise, and it reached 1.75 on day 9. The negative CAR value came to an end on day 20 with -1.08. The results of Automobile Industry are presented in Figure 10 in the form of positive and negative CAR curves. An investor can make 2.90 percent excess returns by acting upon negative information for the period of 8 days (from day -2 to day 9).

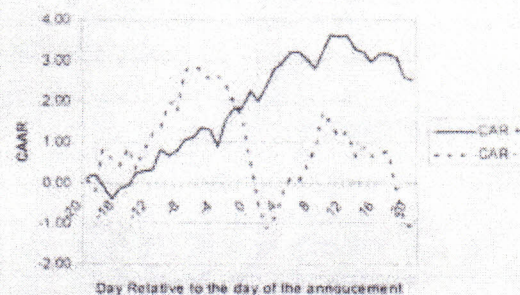


Figure 10  
Cumulative Average Abnormal Return (CAR) for Automobiles industry

## 5.2 Results of Entire Sample Companies

### 5.2.1 ASRV of Entire Sample companies

The results of ASRV for all the 463 quarters were calculated and for each day in the announcement period (41 days) are shown in Table VI. According to Table VI, the ASRV on day 0 was 1.72, which is 72% greater than the average, and on day one, it was 2.27 (127% greater than the average). This shows that the security prices of sample companies reacted to the announcement of quarterly earnings. The significant reaction took place on the next day (day 1) to the day of quarterly earnings announcement. However, it should be noted that the average ASRV during the period of 41 days (20 days of pre announcement period and 21 days of post announcement period) was 1.00. The average ASRV during the pre announcement period of 20 days (from day -20 to day -1) was 0.99 and the average ASRV during post announcement period of 21 days (from day 0 to day 20) was 1.01. The average ASRV during the period of 7 days (from day 3 to day 3), which are very close to the day of the announcement (day 0), was 1.35. Hence, it is understood that the security prices significantly reacted to the announcement. It is interesting to note that the ASRV was continuously higher than one during day -2 to day 4, except day -1, where the ASRV was 0.94.

This is clearly depicted in Figure 11, which shows that the ASRV curve is steeply rising (reacted) during day 0 and 1. The days during which ASRV exceeded 1 were: -19, -18, -15, -13, -12, -10, -7, -4, and 8. The reaction in the share price may be due to anticipation of quarterly earnings. Hence, the null hypothesis of  $ASRV = 1$  (i.e. the quarterly earnings announcement do not contain information relevant for valuation of securities and hence the security prices do not react to the announcement of quarterly earnings announcement) is rejected. In other words, the alternative hypothesis of  $ASRV > 1$  is accepted. The results show that the security prices in the Indian capital market reacted to quarterly earnings information. Therefore, it may be said that the quarterly earnings announcements contain information useful for valuation of securities. Besides, the security prices reacted immediately to the announcement and hence it may be said that the Indian capital market is efficient in the semi-strong form of EMH. However, the reaction after the announcement showed that it is not perfectly efficient.

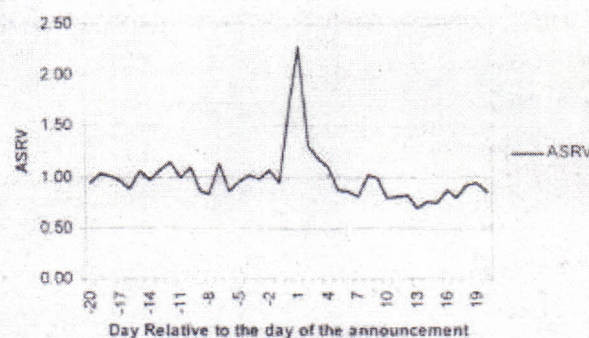


Figure 11  
Average Security Returns Variability for the Entire Sample



### 5.2.2 Average Abnormal Returns(AAR)

The results of average abnormal returns with t-value for the entire sample are shown in Table VI. The results of positive AAR show that there is an abnormal returns of 0.04 on day 0. It is also reflected that on most of the days during the announcement period, generally, the available abnormal returns were negative. On an average, only -0.03 percent of abnormal returns were available during the announcement period of 41 days (from day -20 to day 20). While the average abnormal returns during the post announcement period of 21 days (from day 0 to day 20) was -0.06, there was no average abnormal returns available during the pre announcement period of 20 days (from day -20 to day -1). This proves that the market was unable to capture much of the information before its announcement.

Table VI also gives the values of abnormal returns for the negative earnings change (AAR-). The negative AAR shows that there was a significant negative abnormal returns of -1.19 available on day 0 and -1.23 on day 1, reflecting a sharp reaction in the share prices to the announcement of negative earnings. But the reaction, represented by the abnormal returns, was high as compared to positive AAR on daily basis. There was a negative abnormal returns consecutively from day -3 to day 3. The value of negative AAR on these days was, -0.34, -0.12, -0.20, -1.19, -1.23, -0.36, and -0.15 respectively. Abnormal returns during the post announcement period proved that the market was unable to capture returns content of information before its announcement. While comparing the results of positive and negative AAR, it is inferred that the market reacted little earlier for the positive earnings change than for negative earnings change.

Hence, the null hypothesis of  $AAR = 0$  (i.e. there is no reaction in the security prices and hence the abnormal returns are zero) is rejected. In other words,  $ARR > 0$  and  $AAR < 0$  are accepted.

### 5.2.3 Cumulative Average Abnormal Returns (CAAR)

The analysis of abnormal returns in the preceding section has shown the direction and magnitude of reaction in the security prices to the announcement of quarterly earnings. However, these results show the reaction in the security prices only on the daily basis. It does not show the cumulative effect. So, in this section, the most widely used tool, namely, 'Cumulative Abnormal Returns' (CAR) or Cumulative Average Abnormal Returns (CAAR) is used.

The results of CAR for the entire sample of 463 quarters are presented in Table VI and depicted in the form of curve in Figure 12. The results for the positive earnings change show that the positive earnings information announced by the companies has resulted in negative returns. Hence, there was a negative relationship between the type of information and the market reaction for the positive earnings announcement. The study also shows that there is a positive relationship between the type of information and the market reaction for the negative earnings announcement. This positive relationship shows that the market is efficient, since the market captures the information rightly.

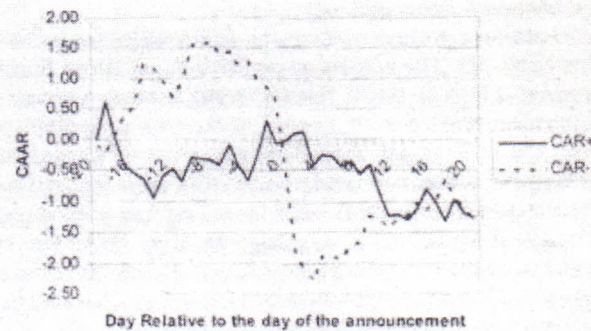


Figure 12  
Cumulative Abnormal Returns for the Entire Sample

The positive earnings information announced by the companies leads to an excess returns of -1.26 over the announcement period. It is inferred from the Table that positive CAR started to fall from day -18 and it reached as low as -0.68 on day -11 during the pre announcement period. After day -11, the positive CAR started to rise. The positive CAR was -0.02 on day 0 and increased to 0.12 on day 2. Again it started to fall steadily from day 2 and the positive CAR ended with -1.26 on day 20.

For the negative information announced, there were positive abnormal returns during the pre announcement period. Only on day 0 the negative CAR was negative at -0.54. Then the negative CAR increased to -2.29 on day 3. Since then the negative CAR gradually declined to -1.30 on day 20. These results show that the market reacts by revising the prices downward only when the negative informations are announced. However, the magnitude of price revision and the timing of reaction for negative information are not the same for positive information. The market reacts to negative informations belatedly and also from the fourth day after the announcement of quarterly earnings, the market starts revising the price upwards. This post announcement drift for the negative earnings information indicates that the market generally has positive expectations about the economy and hence the shares which in turn give the scope for the intelligent investors to make superior returns.

The results of CAR show that the Indian capital market uses the quarterly earnings announced by the companies for valuation of securities and the market is efficient in impounding the information. The market reacts very cautiously to negative informations.

#### VI. Findings of the Study

The following are the important findings of the study.

- i. The quarterly earnings announcements do have information relevant for the security valuation and the market uses the information for valuation of securities in general.

- ii. The Indian capital market is able to capture the information contained in the quarterly earnings announcements. Hence, it is efficient in the semi strong form of efficient market hypothesis.
- iii. The post announcement drift, especially for the negative earnings information, indicates that there is scope for the investors to out perform the market.
- iv. It is found that significant reaction in the share price takes place mostly on days 0, 1 and 2. Thus, the market has been eagerly awaiting the information and reacts immediately once the information is announced.
- v. Apart from the sharp reaction in the share price on days 0, 1, and 2, there has been reactions during the pre announcement period as well as post announcement period.
- vi. The pre announcement reaction shows that the market is able to capture the earnings information before its announcement. However, the reaction during the post announcement period shows that the market is not able to capture the information fully immediately.
- vii. The post announcement drift in the earnings extends upto 20 days following the announcement and hence the investors can design investment strategies to earn superior returns.
- viii. There is difference among the various industrial sectors in their reaction to the announcement of quarterly earnings. However, the behaviour of FMCG sector stocks is erratic and inconsistent. There are differences in the behaviour of different industrial sectors around the announcement of quarterly earnings
- ix. While comparing the results of positive AAR for positive earnings change and negative AAR for negative earnings change, it is found that the market reacted little earlier for the positive earnings change than for negative earnings change.
- x. The market for the positive earnings announced by IT sector companies was efficient as There were no significant average abnormal returns available to the investors. Regarding the announcement of negative earnings, the market was near efficient as there was a significant negative average abnormal returns on day 0 and on day 1.
- xi. The market for the FMCG and Capital Goods Sector was near efficient for the positive earnings and inefficient for the negative earnings.
- xii. The positive expectations of the investors about banking sector was reflected in its average abnormal returns. Banking sector stocks also yielded even for negative earnings. However, the market is efficient for the positive earnings.
- xiii. Automobiles sector stocks yield positive average abnormal returns when the positive earnings were announced and yielded negative average abnormal returns when the negative earnings were announced. However, they reacted in the opposite during the early pre announcement and during the late post announcement period.

- xiv. There were differences in the level of efficiency of the capital market for the different industrial sectors.
- xv. The market reaction for the positive earnings change was positive, except IT sector, according to the EMH. But the market reaction to the negative earnings changes was belated and also not always according to the EMH.

#### VII. Suggestions

From the foregoing analysis, the following suggestions have been made to make Indian capital market more efficient.

- i. It is a known fact that reliability of accounting information is important. The regulation of accounting norms and audit practices will improve the reliability of accounting information. The reliability and disclosure will make Indian capital market more efficient. The regulatory authorities may monitor the reliability or the truth in the information released by the companies.
- ii. The larger the number of analysts, the more efficient will be the market. The market efficiencies are most likely for stocks followed by large number of analysts and least likely for stocks with limited coverage by analysts. Thus, market efficiency depends on the number of investors in the market, particularly the institutional investors and number of analysts.
- iii. The number of trained professionals are not many in the Indian market. There is need to promote programmes that will produce professional analysts.
- iv. The more visible a company, the more perfect its market likely to be. 'Perfect' implies that most of the likely factors affecting the price of its securities are presumably known to the market and vice versa.

#### VIII. Conclusion

The present study used a very large sample, and well established event study methodologies for the analysis and found the relevance of these methodologies to the Indian context. The results of the study are encouraging to the accounting professionals, the analysts, the investors, and the regulatory agencies. The result shows that the Indian capital market is efficient as it is using the information relevant for security valuation and for investment decision making. It is found that the earnings information is captured into the security prices within a short span of time. However the reaction after the announcement showed that the Indian capital market is not perfectly efficient. This gives the scope for the intelligent investors to make superior returns.

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**Annexure I**  
**Table A 1.1**  
**Average Values of ASRV**

Particulars	Period			
	Day -20 t day 20	Day -20 to day -1	Day 0 to day 20	Day -3 t day 3
Entire Sample	1.00	0.99	1.01	1.35
IT	1.02	1.01	1.02	1.50
FMCG	1.01	0.95	1.08	1.27
Banking	1.00	0.99	1.01	1.42
Capital Goods	0.99	1.00	0.98	1.18
Automobile	0.99	1.00	0.98	1.38

**Table A 1.2**  
**Average Values of ASRV**

Particulars	Period			
	Day -20 t day 20	Day -20 to day -1	Day 0 to day 20	Day -3 t day 3
Entire Sample	-0.03	0.00	-0.06	0.03
IT	-0.09	-0.06	-0.11	-0.02
FMCG	0.06	0.06	0.06	0.33
Banking	0.21	0.27	0.16	-0.08
Capital Goods	0.12	0.11	0.14	0.08
Automobile	0.06	0.09	0.03	0.27

**Table A 1.3**  
**Average Values of ASRV**

Particulars	Period			
	Day -20 t day 20	Day -20 to day -1	Day 0 to day 20	Day -3 t day 3
Entire Sample	-0.03	0.03	-0.09	-0.51
IT	-0.21	-0.23	-0.20	-0.84
FMCG	0.13	0.54	-0.27	-0.52
Banking	0.03	-0.06	0.13	0.11
Capital Goods	0.17	0.24	0.11	-0.28
Automobile	-0.02	0.08	-0.13	-0.51