

## EVENT STUDY OF TATA'S GLOBAL GROWTH THROUGH ACQUISITION: TATA'S TAKEOVER OF CORUS

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### ABSTRACT

The event study methodology has been used to estimate cumulative average abnormal returns (CAR) in an 80 day window period (CAR) in a 1-day, 2-day, 5-day, 10-day, 15-day, 20-day, and 80-day window period of **Declaration of Tata takeover of Corus**. The study aims at exploring the implications of the acquisition for the shareholders. The event study methodology has been used to estimate Cumulative Abnormal Returns (CAR) for a 80 day window period. **Market Model Method** (single- factor model) has been used. This procedure has been applied on the Tata & Corus acquisition **event** so as to study the impact of this event on the stock prices. The study endeavors to find the Cumulative Abnormal Return (CAR) of Tata steel & Corus.

**Key words: CAR, acquisition, Market model method**

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## INTRODUCION OF TATA STEEL



## TATA GROUP OF COMPANIES-A BRIEF HISTORY

Tata Steel is part of one of India's largest business conglomerates, the Tata Group established by Jamsetji Tata and his extended family. The Tata's were descendants of Persian Zoroastrians who immigrated to India sometime in between the 8th and 10th centuries to escape religious persecution. Although Jamsetji's father opened an export business when Jamsetji was only a teenager, that business faced a financial crisis following the end of the U.S. Civil War and the return of U.S. producers to world markets. With Jamsetji's expert guidance, the company was reborn as Tata and Co., later to be renamed Tata and Sons in 1868. Tata Steel was founded in 1907, and the plant started production in 1912 (information about Tata group profile obtained from [www.tatasteel.com](http://www.tatasteel.com)). Currently, Tata Steel is now India's largest private steelmaker, the world's 6th largest steelmaker, and due to its ownership of raw materials (coal and iron), can produce steel at lower costs than nearly any other steelmaker in the world ([www.tatasteel.com](http://www.tatasteel.com), 2007, July 23).

In 2005-2006, the Tata Group had revenues of \$21.9 billion (all \$ amounts are referenced with respect to US \$) which was approximately 2.8 percent of India's gross domestic product.

With a market capitalization of \$63.0 billion in 2007, the Tata Group employs around 2,460,000 people and comprises 96 operating companies in seven business sectors: information systems and communications (Tata Consultancy Services), engineering, materials, services, energy, consumer products and chemicals. The group has 28 publicly listed firms with approximately 2 million shareholders. Operations span 85 countries on six continents and there has been an overall rapid growth through acquisition and merger activity ([www.tatasteel.com](http://www.tatasteel.com), 2007, July 23).

The company has been run by family members for five generations. The current chairman of Tata Group is Ratan Tata who succeeded J.R.D. Tata in 1991. At his time of succession, the Tata Group was a sprawling network of 250 companies, many doing poorly. He has since downsized the group to 96 firms. Not content to operate only in India, he has increasingly challenged his managers to expand overseas (Bary, Santoli, Laing & Racanelli, 3/26/07). The Tata Group has made a number of recent acquisitions (Leahy, 2007, May 18). Tata Tea bought out U.S.-based Eight O’Clock Coffee for \$220 million; a 30 percent share of Energy Drinks, another U.S. firm, for \$677 million; and acquired a 33 percent share of South Africa’s Joekels Tea Packers. Tata’s Indian Hotels bought the Ritz Carlton Boston for \$170 million. Tata Motors acquired the truck operations of South Korea’s Daewoo. Tata Steel had also purchased Singapore’s Natsteel in 2004 for \$485 million and Thailand’s Millennium Steel for \$404 million in 2005.

On February 2, 2007, Tata Steel won its bid to acquire Corus, the Anglo-Dutch steel company. The Corus acquisition by Tata Steel made it a “giant among giants in India Inc.” The steel conglomerate is now the largest private company by sales in India, a distinction earlier held by Reliance Industries which is now second (Knight Ridder 2/2/07). The acquisition of Corus is anticipated to make Tata Steel the world’s second largest steelmaker within five years.

### **ACQUISITION OF TATA STEEL**

Tata acquired Corus on the 2nd of April 2007 for a price of \$12 billion making the Indian company the world’s fifth largest steel producer. This acquisition process has started long back in the year 2005. However, Corus was involved in a considerable number of Acquisition & Acquisition (M&A) deals and joint ventures (JVs) before Tata. This process started in the year 2000 and with Tata it came to an end. In a period of seven years Corus was involved in 14 deals apart from Tata. (Refer *Exhibit – 1* for the details about M&A deals by Corus). In 2005, when the deal was started the price per share was 455 pence. But during the time of acquisition held in 2007, the price per share was 608 pence, which is 33.6% higher than the first offer. For this deal Tata has financed only \$4 billion, although the total price of this deal was \$12billion. Here the important point is how Tata could manage to get such a huge amount for this deal? Did Tata Steel overheat in its zeal to win Corus? However as stated by Muthuraman (the Managing Director of Tata Steel), the bid made to Corus was unanimously supported by the management of

the company and recommended to its shareholders. In an interview to CNBC India, B Muthuraman also said that they are acquiring Corus for synergy and not for tonnage. "There are synergies in operations, manufacturing, marketing etc."

### **Post Acquisition Tata**



Tata Steel has formed a seven-member integration committee to spearhead its union with Corus group. While Ratan Tata, chairman of the Tata group, heads the committee, three of the members are from Tata Steel and the other three are from Corus group. Members of the integration committee from Tata Steel include managing director B Muthuraman, deputy managing director (steel) T Mukherjee, and chief financial officer Kaushik Chatterjee. The Corus group is represented in the committee by CEO Phillippe Varin, executive director (finance) David Lloyd, and division director (strip products) Rauke Henstra.

The acquisition by Tata amounted to a total of 608 pence per ordinary share or £6.2 billion (US \$12 billion) which was paid in cash. First of all, the general assumption is that the acquisition was not cheap for Tata. The price that they paid represents a very high 49% premium over the closing mid market share price of Corus on 4 October, 2006 and a premium of over 68% over the average closing market share price over the twelve month period. Moreover, since the deal was paid for in cash automatically makes it more expensive, implying a cash outflow from Tata Steel in the amount of £1.84 billion. Tata has reportedly financed only \$4 billion of the Corus purchase from internal company resources, meaning that more than two-thirds of the deal has had to be financed through loans from major banks. The day after the acquisition was officially announced, Tata Steel's share fell by 10.7 percent on the Bombay stock market. Despite its four times smaller size and smaller capacity, Tata Steel's operating profit for 2006, earning \$840 million on sales of 5.3 million tones, were very close in amount to those generated by Corus (\$860 million in profits on sales of 18.6 million tons).

Tata's new debt amounting to \$8 billion due to the acquisition, financed with Corus' cash flows, is expected to generate up to \$640 million in annual interest charges (8% annual interest cost). This amount combined with Corus' existing interest debt charges of \$400 million on an annual basis implies that the combined entity's interest obligation will amount to approximately \$725 million after the acquisition.

The debate whether Tata Steel has overpaid for acquiring Corus is most likely to be certain, since just based on the numbers alone it turns out that at the end of the bidding conflict with CSN Tata ended up paying approximately 68% above the average price of Corus' shares. Another pressing issue resulting for this deal that has created a dilemma between experts and analysts opinions is whether this acquisition for the right move for Tata Steel in the first place. The fact that Tata has managed to acquire a British steel maker that has been a symbol of Britain's industrial power and at the same time its dominion over India has been perceived as quite ironic. Only time will show whether Tata will be able to truly benefit from the many expected synergies for the deal and not make the typical mistakes made in many large M&A deal during this beginning period.

**Objective of the study:**

- To make an event study of declaration of Acquisition of Corus by Tata steel. The study aims at exploring the implications of the acquisition for the shareholders. The event study methodology has been used to estimate Cumulative Abnormal Returns (CAR) for a 80 day window period.

**Market Model Method** (single- factor model) has been used. The study endeavours to find the Cumulative Abnormal Return (**CAR**) of Tata & Corus steel. Market model assumes that all inter-relationships among the returns on individual assets arise from a common market factor that affects the return on all assets i.e. the expected return on individual assets (**Fama and Miller, 1969**). The event study methodology has been extensively used to assess the impact of an announcement of a particular strategy of the firms' stock prices. This analytical approach is well accepted and has been widely used in various disciplines such as finance, accounting, marketing, strategy, e-commerce and law. The methodology has also been applied to assess the impact of some marketing and advertising related events such as brand extension announcements (**Lane**

and Jacobson, 1995). The event study analysis assumes that all public information is incorporated in the stock prices immediately on announcement (Brown and Warner, 1980 and 1985; Pruitt and Peterson, 1986; Etebari, Horrigan and Landwehr, 1987; MacKinsley, 1997; and McWilliams and Siegel, 1997).

### Literature review:

Market model assumes that all interrelationships among returns on individual assets arise from a common market factor that affects the return on all assets (Fama et al., 1969). The event study methodology has been used to estimate cumulative average abnormal returns (CAR) in a 80 day window period (CAR) in a 1-day, 2- day, 5-day, 10-day, 15-day, 20-day, and 80-day window period. For event study analysis in semi strong version of the efficient market hypothesis, it assumes that all publically information is incorporated in the stock prices immediately on announcement Cornell and Tehranian (1992); Switzer (1996); Ghosh (2001) found merger and acquisition firms shows significantly increase in operating performance.

Pawaskar (2001) found that the share holders of the acquirers companies increased their liquidity performance after the mergers and acquisitions. A mergers and acquisitions occur when two or more companies connect together, often to share and reduce cost, increase the efficiency or market share. Merger and acquisition frequently assigned to as a tool for exploring and expanding one's business or get around different legal framework such as tax or monopoly regulations.

Ross and Westerfield(2002).id debatable issue for all state holders, academicians and for researchers. The purpose of this research paper is to find the rational for merger and acquisition in terms of management incentives, post merger and acquisition value creation and steel industry position of the entity merger and acquisition between Tata steel and European steel giant Corus. Many studies have been done made on the effects of corporate integration on their share prices, share holders wealth. There is no conclusive evidence of life after acquisition. So the study helps to understand and evaluate the performance by analyzing the value creation through pre and post merger and acquisition study. A deal that dies at the due diligence stage almost always dies for the right reason. In most of the merger and acquisition, the target has a choice, and negotiations may even be taking place in the context of structured action. Before

deciding on tactics, therefore, acquires should assess their advantages and disadvantages relative to their potential bidder HBR (2001).

**Rao and Sankar (1997)** examine that a positive effect on the liquidity, leverage, and profitability of the bidder firms. Other studies have also showed a positive impact on financial performance

**Hitt, Harrison and Best (1998)** In accordance with empire building theory (The Hubris Theory), managers may derive both financial and non financial benefits in proportion to the size of the business units they manage; this provides a strong intensive to increase firm size by merger and acquisition and places managers in conflicts with shareholders interest.

**Rau and Vermalen (1997)** has investigated that the determinants of poor performance of the bidding firm after acquisition and concluding that firms having low book to market ratio in general make poor decisions regarding merger and acquisition. However, higher profitability of the firm being acquired is found to be existing pre and post merger and acquisition **Acharys (2000)** Clear and factual communication among the employees of the acquiring and acquired firms is very crucial to increase their productivity which will resultantly have positive. The subsequent studies are the few existing work reviewed which were conducted by researchers in the sight of analyzing the financial performance during and post merger activity across different time periods.

Effect of mergers on corporate performance in India, writer **Mrs. Vardhana Pawaskar (2001)**, considered the impact of mergers on corporate performance. A case study, assessed the financial performance of a cloth unit by using ratio analysis. It compared the before and after merger performance of the corporations between 1992 and 2000 to identify their financial character. Mergers & acquisitions in the banking sector presents the Indian scenario, author **Mr. Selvam (2007)** has analyzed the impacts of stock price changes to mergers and acquisitions behavior taken place in banking industry with particular reference to private and public sector banks. Found that share prices are market sensitive. From the financial analysis it was noted that greater part of the banks went for branch extension and this has affected profitability to some extent and it resulted in harmful competition among the players. To add up the review of literature, many offerings have offered diverse perspectives of merger in different industries globally and

explained the valuation techniques followed by merging companies, and shareholders possessions effect due to merger. From the review of several papers evaluating the pre and post merger performance of merged companies, it is incidental that majority of the studies powerfully support the concept of improved post merger performance due to merger and it is valuable to the acquirer companies.

### **ANALYSIS OF STUDY**

Event study methodology is designed to investigate the effect of an event on a specific dependent variable. A commonly used dependent variable in event studies is the stock price of the company. The definition of such an event study will be a study of the changes in stock price beyond expectation (Abnormal returns) over a period of time (event window). We attribute the abnormal returns to the effects of the event. The event study methodology seeks to determine whether there is an abnormal stock price effect associated with an event. From this, we can infer the significance of the event. The event study methodology has been extensively used to assess the impact of an announcement of a particular strategy on the firms' stock prices. This analytical approach is well accepted and has been used widely in various disciplines such as finance, accounting, marketing, strategy, e-commerce and law. The methodology has also been applied to assess the impact of some marketing and advertising relating events such as brand extension announcements (**Lane and Jacobson, 1995**). An event study is concerned with the impact of a particular firm-specific corporate event on company security prices. For example, an event study might be conducted to determine the impact of acquisition on stock prices. If event studies suggest that security prices rise when acquisitions are announced, then this might suggest that acquisitions benefit stock investors. Furthermore, if stock prices rise on acquisition announcement news, we might conclude that the stock market, based on opinions of huge number of investors, believes that acquisitions make companies more valuable. Event studies measure stock performance that reflects investor opinions concerning the importance and benefit level of the event. Event studies have been performed on announcements of many types of corporate events such as dividends, earnings, takeovers, insider transactions, managerial changes, and so on. Stock market has been found to react to various corporate announcements of acquisition is one such significant announcement, which has been bearing on the stock price movement of the firm surrounding the announcement. The magnitude of abnormal returns



provides a direct measure of unexpected change in security holders' wealth associated with the event (**Kothari and Warner, 2004**). The key assumption of the event study methodology is that the market must be efficient. Given an efficient market, the effects of the event will be reflected immediately in the stock prices of the company. This will allow us to observe the economic effect of the event over a relatively short period.

The procedure of an event study comprises of:

1. Identify the event in question.
2. Identify estimation, event and post-event windows.
3. Estimate parameters using data in estimation window
  - $R_i$  and  $\sigma_e$  from the constant mean model.
  - $\alpha_i$ ,  $\beta_i$  and  $\sigma_e$  from the market model.
4. Measure abnormal returns in the event window:
  - From the constant mean model:  $AR_{it} = R_{it} - R_i$
  - The market model:  $AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt}$
5. Aggregate abnormal returns:  $CAR_i(T_1, T_2) = \sum_{t=T_1}^{T_2} AR_{it}$

This procedure has been applied on the Hero & Honda Separation event so as to study the impact of this event on the stock prices. The event study methodology has been used to estimate cumulative average abnormal returns (CAR) in a 80 day window period. The basis for event study analysis assumes that all publically available information is incorporated in the stock prices immediately on announcement (**Brown and Warner, 1980 and 1985; Pruitt and Peterson, 1986; Etebari, Horrigan and Landwehr, 1987; MacKinsley, 1997; and McWilliams and Siegel, 1997**).

**The stepwise detail is presented below:**

**Step – 1:**

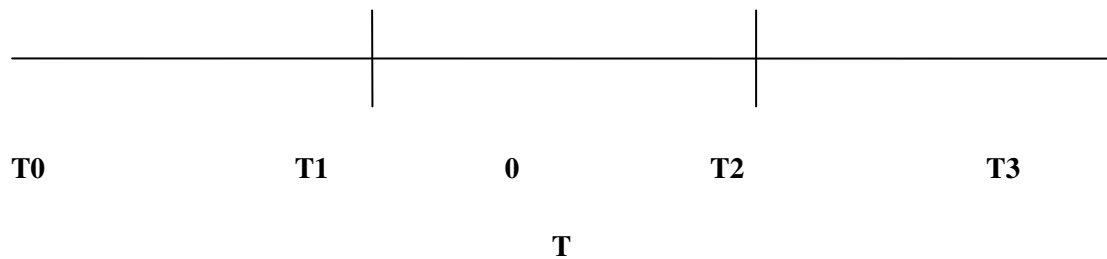
We have to first decide the event that we wish to investigate, and then collect data of company that had went through such an event. Event in question is the Tata & Corus acquisition. For this study, the data that

we used includes the announcement date (e.g. first announcement date of acquisition) and the stock prices of the Tata steels before and after the event (i.e. -240 to +400 days) i.e. from 05/07/2006 to 07/05/2007.

**Step - 2**

The next step in the procedure is to identify the window periods, i.e. an estimation window, event window and post event window. We need to decide on a period over which the security prices of the firm involved in this event will be examined. This is our event window i.e.  $t(-40)$  to  $t(40)$ .

**(Estimation window) -40 (Event Window) +40 (Post Event Window)**



**Window period and clean data period**

The event window has been taken from -40 days to the date of announcement to 40 days. The estimation window has been taken as 240 days before the 40 days window period. The share price data and market index data, namely Tata steel and Metal Index have been taken from the official website of the National Stock Exchange Limited (<http://www.nse.com>). Corporate Announcements during  $t(-40)$  to  $t(40)$  have been presented in Table-4.1(1). The dates mentioned below have been excluded while conducting the event study to know the impact of acquisition on stock prices of Tata steel & Corus, because these data on these dates was influenced by announcement other than the event of acquisition.

**Step - 3**

Next we have to make estimations of the important parameters that will give us the expected returns during the event period. We have used the market model to find the expected returns. For this purpose; we need the alpha (y-intercept) and beta (slope) of the prices over a reasonably long estimation window (i.e. -240 to -40 days). Using the simple regression model in SPSS, the values of alpha and beta have been calculated. The estimated Beta value is 0.308 and alpha value is 0.159

**Step 4:**

Using these estimates, the expected returns ( $R_{jt}$ ) for the Tata steel have been calculated w.r.t Metal Index. The market model has been used for this purpose i.e.

$$R_j = \alpha_j + \beta_j R_{mt} + \epsilon_{jt}$$

Where  $R_{mt}$  is the return on the market index (Auto index) for day  $t$ ,  $\beta$  measures the sensitivity of firm  $j$  to the market, this is a measure of risk,  $\alpha_j$  measures the mean return over the period not explained by the market, and  $\epsilon_{jt}$  is a statistical error term with  $E(\epsilon_{jt})=0$ . The regression produces estimates of  $\alpha_j$  and  $\beta_j$ ; call these  $\hat{\alpha}_j$ ,  $\hat{\beta}_j$ . The predicted return for a firm for a day in the event period is the return given by the market model on that day using these estimates that is:

$$R_{jt} = \hat{\alpha}_j + \hat{\beta}_j R_{mt}$$

While using market model for Tata steel & Corus

$$\text{Alpha } (\hat{\alpha}_j) = 0.159$$

$$\text{Beta } (\hat{\beta}_j) = 0.308$$

$$R_{jt} = 0.159 + 0.308(\text{Return on market Metal Index}) + \epsilon_{jt}$$

Where  $\epsilon_{jt}$  is a statistical error term with  $E(\epsilon_{jt})=0$

After that, we deducted the expected return from the actual return ( $R_j - R_{jt}$ ) to get the abnormal return on each day in the event window.

As explained above, to estimate the abnormal returns, (or prediction error or PE),

$$PE_{jt} = R_j - (\hat{\alpha}_j + \hat{\beta}_j R_{mt})$$

**Step 5:**

After calculating abnormal return we have to calculate standard deviation of abnormal return

$$\text{Standard deviation} = \sqrt{\text{Var}(PE_{jt})}$$

Value calculated for **standard deviation of abnormal returns for Tata steel & corus**= 62.28207

While  $PE_{jt}$  is the prediction error from the estimates market models and  $VAR(PE_{jt})$  is the variance of the prediction error. Next step is to calculate the T statistic.

The T statistic is calculated as:

$$T = \frac{PE_{jt}}{\sqrt{Var(PE_{jt})}}$$

$$\sqrt{Var(PE_{jt})}$$

The cumulative abnormal return for the event windows is calculated as shown below:

$$CAR(-T \text{ to } +T) = \sum_{t=-T}^{+T} AR_t$$

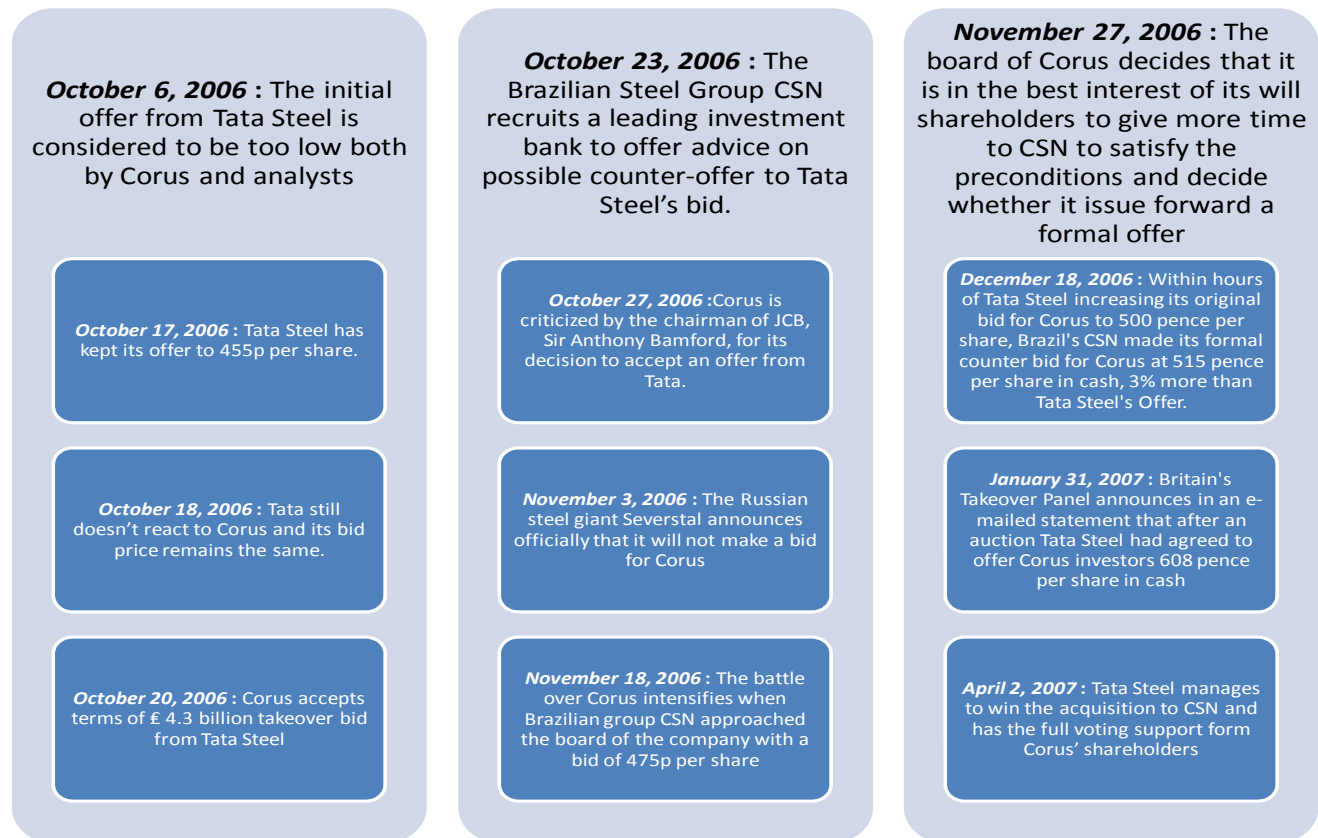
We then added up the abnormal return over the entire period of time to get the Cumulative Abnormal Return (CAR). **Cumulative Abnormal Return for Tata Steel is -25.87647628 i.e. stockholders have lose about 26% abnormal returns because of the acquisition event, as shown in Table-4.1(4).** The event study methodology is widely used in corporate finance because we are interested to know how corporate policies can impact the value of firm e.g. effect of acquisition on share prices of company. On the surface, this might be a daunting task. However, using the event study methodology, we are able to find the economic effect as long as we make sure that we can remove any confounding effects on return due to other events. To get a representative event study, we have to choose a reasonably large sample and choose an appropriate event period. The usefulness of such a study in corporate finance comes from the fact that, given rationality in the marketplace, the effects of an event will be reflected immediately in security prices. Thus, a measure of the event's economic impact can be constructed using security prices observed over a relatively short time period. In contrast, direct productivity related measures may require many months or even years of observation. The event findings are very clear and easy to interpret and share. We need not look at any factors such as investor's sentiment, management considerations etc. We assume that all these are reflected in the stock price and return immediately due to the efficient market hypothesis. Therefore, we only have to

look at the effect on one single item, the returns. This is the case in corporate finance research, whereby the research might be done to investigate a very sophisticated effect of an event, but their data have to be easy enough so that even the common investor on the street will be able to understand their publication. Due to the entire reasons quoted above, researchers often choose to use the event study methodology to examine the direction, magnitude and speed of price reactions to the various phenomenon's in corporate finance.

**Using the single-factor model, this study finds that the average Cumulative Abnormal Return (CAR) of Tata steel is negative. These results are also statistically. Thus, the shareholders of Tata steels got significant negative abnormal returns. Results reveal that the acquisition announcement in Tata Steels generated a negative abnormal Return i.e. CAR of -25.87 per cent.**

**Table- 4.1(1)**

**Corporate Announcement for Event Window**



**Table – 4.1 (2)**

Alpha ( $\alpha_j$ ) and Beta ( $\beta_j$ ) Estimates for Tata steel in Relation to Metal index

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.159	.297		.534	.594
	Metal index	.313	.067	.308	4.670	.000

a. Dependent Variable: Tata steel

**Table – 4.1 (3)**

Standard Deviation of Abnormal Returns (PEjt)

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
VAR00002	54	-80.87	135.08	7.5255	62.28207
Valid N (listwise)	54				

**Table – 4.1 (4)**

**Event Study- Cumulative Abnormal Returns for TATA ACQUIRING CORUS**

Date	Close	Close Price	X	y	predictive return	PEJT	STD. DEVIATION	T-STATISTICS
5-Jul-06	2609.24	563.65						
6-Jul-06	2614.35	547.35	2613.35	546.35	805.4458	-259.0958	62.28207	-0.240382399
7-Jul-06	2578.89	522.9	2577.89	521.9	794.52412	-272.62412	62.28207	-0.228453997
10-Jul-06	2580.46	527.55	2579.46	526.55	795.00768	-268.45768	62.28207	-0.231999584
11-Jul-06	2581.33	514.5	2580.33	513.5	795.27564	-281.77564	62.28207	-0.22103426

12-Jul-06	2585.6	519.95	2584.6	518.95	796.5908	-277.6408	62.28207	-0.224326072
13-Jul-06	2596.34	519.3	2595.34	518.3	799.89872	-281.59872	62.28207	-0.221173129
14-Jul-06	2514.87	511.35	2513.87	510.35	774.80596	-264.45596	62.28207	-0.235510177
17-Jul-06	2487.7	494.45	2486.7	493.45	766.4376	-272.9876	62.28207	-0.228149813
18-Jul-06	2544.21	477.75	2543.21	476.75	783.84268	-307.09268	62.28207	-0.202811965
19-Jul-06	2547.33	460.2	2546.33	459.2	784.80364	-325.60364	62.28207	-0.19128186
20-Jul-06	2564.64	487.05	2563.64	486.05	790.13512	-304.08512	62.28207	-0.204817881
21-Jul-06	2539.64	483.05	2538.64	482.05	782.43512	-300.38512	62.28207	-0.20734073
24-Jul-06	2507.61	479	2506.61	478	772.56988	-294.56988	62.28207	-0.211433939
25-Jul-06	2420.51	495.6	2419.51	494.6	745.74308	-251.14308	62.28207	-0.24799437
26-Jul-06	2437.74	496.45	2436.74	495.45	751.04992	-255.59992	62.28207	-0.243670147
27-Jul-06	2411.25	497.75	2410.25	496.75	742.891	-246.141	62.28207	-0.253034115
28-Jul-06	2468.86	497.7	2467.86	496.7	760.63488	-263.93488	62.28207	-0.235975139
31-Jul-06	2420.81	496.2	2419.81	495.2	745.83548	-250.63548	62.28207	-0.248496621
1-Aug-06	2374.65	496.4	2373.65	495.4	731.6182	-236.2182	62.28207	-0.263663299
2-Aug-06	2425.72	511.05	2424.72	510.05	747.34776	-237.29776	62.28207	-0.262463792
3-Aug-06	2328.23	509.7	2327.23	508.7	717.32084	-208.62084	62.28207	-0.298541939
4-Aug-06	2308.94	510.5	2307.94	509.5	711.37952	-201.87952	62.28207	-0.308511086
7-Aug-06	2247.58	503.85	2246.58	502.85	692.48064	-189.63064	62.28207	-0.328438854
8-Aug-06	2189.29	511.15	2188.29	510.15	674.52732	-164.37732	62.28207	-0.378896979
9-Aug-06	2129.07	516.9	2128.07	515.9	655.97956	-140.07956	62.28207	-0.444619258
10-Aug-06	2102.85	516.15	2101.85	515.15	647.9038	-132.7538	62.28207	-0.469154706
11-Aug-06	2190.23	525.35	2189.23	524.35	674.81684	-150.46684	62.28207	-0.413925553
14-Aug-06	2142.25	531.7	2141.25	530.7	660.039	-129.339	62.28207	-0.481541298
16-Aug-06	2144.83	532.45	2143.83	531.45	660.83364	-129.38364	62.28207	-0.481375157
17-Aug-06	2164.81	518.65	2163.81	517.65	666.98748	-149.33748	62.28207	-0.417055852
18-Aug-06	2173.28	513	2172.28	512	669.59624	-157.59624	62.28207	-0.395200228
21-Aug-06	2156.51	508.05	2155.51	507.05	664.43108	-157.38108	62.28207	-0.395740517
22-Aug-06	2117.89	515.45	2116.89	514.45	652.53612	-138.08612	62.28207	-0.451037874
23-Aug-06	2089.12	505.5	2088.12	504.5	643.67496	-139.17496	62.28207	-0.447509164
24-Aug-06	2076.3	517.45	2075.3	516.45	639.7264	-123.2764	62.28207	-0.505222979
25-Aug-06	2067.8	525.75	2066.8	524.75	637.1084	-112.3584	62.28207	-0.554316099
28-Aug-06	2089.93	527.55	2088.93	526.55	643.92444	-117.37444	62.28207	-0.530627196
29-Aug-06	2058.53	517.25	2057.53	516.25	634.25324	-118.00324	62.28207	-0.52779966
30-Aug-06	2124.09	506.85	2123.09	505.85	654.44572	-148.59572	62.28207	-0.419137711
31-Aug-06	2101.73	496.25	2100.73	495.25	647.55884	-152.30884	62.28207	-0.4089196
1-Sep-06	2101.04	501.85	2100.04	500.85	647.34632	-146.49632	62.28207	-0.425144263
4-Sep-06	2113.01	506.1	2112.01	505.1	651.03308	-145.93308	62.28207	-0.42678514
5-Sep-06	1984.79	513.9	1983.79	512.9	611.54132	-98.64132	62.28207	-0.631399397
6-Sep-06	2043.09	521.6	2042.09	520.6	629.49772	-108.89772	62.28207	-0.571931809
7-Sep-06	2046.48	522.2	2045.48	521.2	630.54184	-109.34184	62.28207	-0.569608761

8-Sep-06	2154.99	525.45	2153.99	524.45	663.96292	-139.51292	62.28207	-0.446425105
11-Sep-06	2183.61	496.7	2182.61	495.7	672.77788	-177.07788	62.28207	-0.351721344
12-Sep-06	2176.86	501	2175.86	500	670.69888	-170.69888	62.28207	-0.364865136
13-Sep-06	2282.08	501.95	2281.08	500.95	703.10664	-202.15664	62.28207	-0.308088174
14-Sep-06	2300.44	508.05	2299.44	507.05	708.76152	-201.71152	62.28207	-0.308768037
15-Sep-06	2239.53	504.3	2238.53	503.3	690.00124	-186.70124	62.28207	-0.33359216
18-Sep-06	2256.61	498.35	2255.61	497.35	695.26188	-197.91188	62.28207	-0.314695965
19-Sep-06	2283.51	488.3	2282.51	487.3	703.54708	-216.24708	62.28207	-0.288013461
20-Sep-06	2288.96	496.15	2287.96	495.15	705.22568	-210.07568	62.28207	-0.296474442
21-Sep-06	2318.52	502.95	2317.52	501.95	714.33016	-212.38016	62.28207	-0.293257478
22-Sep-06	2287.01	496.8	2286.01	495.8	704.62508	-208.82508	62.28207	-0.298249952
25-Sep-06	2191.01	507.7	2190.01	506.7	675.05708	-168.35708	62.28207	-0.369940308
26-Sep-06	2161.06	513.05	2160.06	512.05	665.83248	-153.78248	62.28207	-0.405001077
27-Sep-06	2172.81	516.35	2171.81	515.35	669.45148	-154.10148	62.28207	-0.404162699
28-Sep-06	2292	519.05	2291	518.05	706.162	-188.112	62.28207	-0.331090361
29-Sep-06	2337.01	535.65	2336.01	534.65	720.02508	-185.37508	62.28207	-0.335978655
3-Oct-06	2365.62	534.95	2364.62	533.95	728.83696	-194.88696	62.28207	-0.319580489
4-Oct-06	2318.88	523.75	2317.88	522.75	714.44104	-191.69104	62.28207	-0.324908613
5-Oct-06	2329.66	537.4	2328.66	536.4	717.76128	-181.36128	62.28207	-0.343414372
6-Oct-06	2386.73	536.6	2385.73	535.6	735.33884	-199.73884	62.28207	-0.311817521
9-Oct-06	2397.55	526.3	2396.55	525.3	738.6714	-213.3714	62.28207	-0.291895118
10-Oct-06	2339.84	517.9	2338.84	516.9	720.89672	-203.99672	62.28207	-0.305309174
11-Oct-06	2447.87	507.1	2446.87	506.1	754.16996	-248.06996	62.28207	-0.251066554
12-Oct-06	2434.1	516.25	2433.1	515.25	749.9288	-234.6788	62.28207	-0.265392826
13-Oct-06	2346.6	511.7	2345.6	510.7	722.9788	-212.2788	62.28207	-0.293397504
16-Oct-06	2273.66	511.75	2272.66	510.75	700.51328	-189.76328	62.28207	-0.328209283
17-Oct-06	2296.37	515.65	2295.37	514.65	707.50796	-192.85796	62.28207	-0.322942698
18-Oct-06	2287.13	509	2286.13	508	704.66204	-196.66204	62.28207	-0.316695942
19-Oct-06	2310.61	502.15	2309.61	501.15	711.89388	-210.74388	62.28207	-0.295534418
20-Oct-06	2310.91	508.4	2309.91	507.4	711.98628	-204.58628	62.28207	-0.304429359
21-Oct-06	2320.39	516	2319.39	515	714.90612	-199.90612	62.28207	-0.311556595
23-Oct-06	2353.7	508.8	2352.7	507.8	725.1656	-217.3656	62.28207	-0.286531401
26-Oct-06	2276.99	500.55	2275.99	499.55	701.53892	-201.98892	62.28207	-0.308343992
27-Oct-06	2224.21	500.55	2223.21	499.55	685.28268	-185.73268	62.28207	-0.335331779
30-Oct-06	2172.02	498.15	2171.02	497.15	669.20816	-172.05816	62.28207	-0.361982657
31-Oct-06	2206.52	490.45	2205.52	489.45	679.83416	-190.38416	62.28207	-0.327138928
1-Nov-06	2211.52	489.9	2210.52	488.9	681.37416	-192.47416	62.28207	-0.323586657
2-Nov-06	2245.95	486.8	2244.95	485.8	691.9786	-206.1786	62.28207	-0.302078247
3-Nov-06	2255.37	492.65	2254.37	491.65	694.87996	-203.22996	62.28207	-0.306461065
6-Nov-06	2298.68	506.4	2297.68	505.4	708.21944	-202.81944	62.28207	-0.307081363
7-Nov-06	2309.34	497.2	2308.34	496.2	711.50272	-215.30272	62.28207	-0.289276745



8-Nov-06	2280.21	494.15	2279.21	493.15	702.53068	-209.38068	62.28207	-0.297458533
9-Nov-06	2254.94	502.1	2253.94	501.1	694.74752	-193.64752	62.28207	-0.321625962
10-Nov-06	2255.77	502.3	2254.77	501.3	695.00316	-193.70316	62.28207	-0.321533577
13-Nov-06	2252.73	497.1	2251.73	496.1	694.06684	-197.96684	62.28207	-0.314608598
14-Nov-06	2214.08	491.65	2213.08	490.65	682.16264	-191.51264	62.28207	-0.325211276
15-Nov-06	2200.21	486.2	2199.21	485.2	677.89068	-192.69068	62.28207	-0.323223054
16-Nov-06	2191.8	482.3	2190.8	481.3	675.3004	-194.0004	62.28207	-0.321040936
17-Nov-06	2194.24	476.35	2193.24	475.35	676.05192	-200.70192	62.28207	-0.310321247
20-Nov-06	2241.3	462.3	2240.3	461.3	690.5464	-229.2464	62.28207	-0.27168178
21-Nov-06	2249.61	475.7	2248.61	474.7	693.10588	-218.40588	62.28207	-0.285166636
22-Nov-06	2172.98	473.05	2171.98	472.05	669.50384	-197.45384	62.28207	-0.315425975
23-Nov-06	2153.61	471.05	2152.61	470.05	663.53788	-193.48788	62.28207	-0.321891325
24-Nov-06	2130.43	483.1	2129.43	482.1	656.39844	-174.29844	62.28207	-0.357330048
27-Nov-06	2229.88	482.35	2228.88	481.35	687.02904	-205.67904	62.28207	-0.302811944
28-Nov-06	2312.42	476	2311.42	475	712.45136	-237.45136	62.28207	-0.262294013
29-Nov-06	2341.21	477.4	2340.21	476.4	721.31868	-244.91868	62.28207	-0.254296936
30-Nov-06	2342.29	467.9	2341.29	466.9	721.65132	-254.75132	62.28207	-0.244481834
1-Dec-06	2352.65	468.15	2351.65	467.15	724.8422	-257.6922	62.28207	-0.241691716
4-Dec-06	2334.64	468.55	2333.64	467.55	719.29512	-251.74512	62.28207	-0.2474013
5-Dec-06	2314.71	493.05	2313.71	492.05	713.15668	-221.10668	62.28207	-0.281683349
6-Dec-06	2294.42	491.05	2293.42	490.05	706.90736	-216.85736	62.28207	-0.287202934
7-Dec-06	2308.74	492.05	2307.74	491.05	711.31792	-220.26792	62.28207	-0.282755973
8-Dec-06	2282.11	484.7	2281.11	483.7	703.11588	-219.41588	62.28207	-0.283853976
11-Dec-06	2336.63	453.85	2335.63	452.85	719.90804	-267.05804	62.28207	-0.233215484
12-Dec-06	2310.16	441.4	2309.16	440.4	711.75528	-271.35528	62.28207	-0.229522234
13-Dec-06	2280.9	436.55	2279.9	435.55	702.7432	-267.1932	62.28207	-0.233097511
14-Dec-06	2262.51	435.8	2261.51	434.8	697.07908	-262.27908	62.28207	-0.237464879
15-Dec-06	2222.61	459.15	2221.61	458.15	684.78988	-226.63988	62.28207	-0.274806314
18-Dec-06	1688.92	468.15	1687.92	467.15	520.41336	-53.26336	62.28207	-1.169322964
19-Dec-06	1721.02	455.05	1720.02	454.05	530.30016	-76.25016	62.28207	-0.816812319
20-Dec-06	1751.64	465.1	1750.64	464.1	539.73112	-75.63112	62.28207	-0.82349792
21-Dec-06	1746.96	468.4	1745.96	467.4	538.28968	-70.88968	62.28207	-0.87857739
22-Dec-06	1746.3	478.6	1745.3	477.6	538.0864	-60.4864	62.28207	-1.029687169
26-Dec-06	1760.35	477.75	1759.35	476.75	542.4138	-65.6638	62.28207	-0.948499325
27-Dec-06	1786.74	481.1	1785.74	480.1	550.54192	-70.44192	62.28207	-0.884162016
28-Dec-06	1761.39	476.45	1760.39	475.45	542.73412	-67.28412	62.28207	-0.925657793
29-Dec-06	1765.79	482.25	1764.79	481.25	544.08932	-62.83932	62.28207	-0.991132145
2-Jan-07	1785.25	478.7	1784.25	477.7	550.083	-72.383	62.28207	-0.860451625
3-Jan-07	1781.94	471.45	1780.94	470.45	549.06352	-78.61352	62.28207	-0.792256472
4-Jan-07	1744.17	465.8	1743.17	464.8	537.43036	-72.63036	62.28207	-0.857521152
5-Jan-07	1736.76	468.65	1735.76	467.65	535.14808	-67.49808	62.28207	-0.92272358

8-Jan-07	1748.67	463.95	1747.67	462.95	538.81636	-75.86636	62.28207	-0.820944487
9-Jan-07	1745.5	454.95	1744.5	453.95	537.84	-83.89	62.28207	-0.742425438
10-Jan-07	1764.14	452.05	1763.14	451.05	543.58112	-92.53112	62.28207	-0.673093225
11-Jan-07	1774.88	462.1	1773.88	461.1	546.88904	-85.78904	62.28207	-0.725990989
12-Jan-07	1765.71	468.15	1764.71	467.15	544.06468	-76.91468	62.28207	-0.809755303
15-Jan-07	1731.41	486	1730.41	485	533.50028	-48.50028	62.28207	-1.284158978
16-Jan-07	1750.93	482.45	1749.93	481.45	539.51244	-58.06244	62.28207	-1.072674004
17-Jan-07	1744.28	484.1	1743.28	483.1	537.46424	-54.36424	62.28207	-1.145644085
18-Jan-07	1736.78	475.75	1735.78	474.75	535.15424	-60.40424	62.28207	-1.031087718
19-Jan-07	1740.33	467.8	1739.33	466.8	536.24764	-69.44764	62.28207	-0.89682054
22-Jan-07	1707.81	471.35	1706.81	470.35	526.23148	-55.88148	62.28207	-1.114538663
23-Jan-07	1681.61	464.6	1680.61	463.6	518.16188	-54.56188	62.28207	-1.141494208
24-Jan-07	1687.44	480.8	1686.44	479.8	519.95752	-40.15752	62.28207	-1.550944132
25-Jan-07	1685.27	510.1	1684.27	509.1	519.28916	-10.18916	62.28207	-6.11258141
29-Jan-07	1630.34	519.25	1629.34	518.25	502.37072	15.87928	62.28207	3.922222544
31-Jan-07	1669.02	464.9	1668.02	463.9	514.28416	-50.38416	62.28207	-1.236143859
1-Feb-07	1666.48	457.4	1665.48	456.4	513.50184	-57.10184	62.28207	-1.090719143
2-Feb-07	1665.81	462.65	1664.81	461.65	513.29548	-51.64548	62.28207	-1.205953938
5-Feb-07	1653.38	470	1652.38	469	509.46704	-40.46704	62.28207	-1.539081435
6-Feb-07	1610.66	464.9	1609.66	463.9	496.30928	-32.40928	62.28207	-1.921735688
7-Feb-07	1640.85	464.55	1639.85	463.55	505.6078	-42.0578	62.28207	-1.480868471
8-Feb-07	1627.37	462.65	1626.37	461.65	501.45596	-39.80596	62.28207	-1.564641828
9-Feb-07	1597.19	453.3	1596.19	452.3	492.16052	-39.86052	62.28207	-1.562500188
12-Feb-07	1587.08	443.8	1586.08	442.8	489.04664	-46.24664	62.28207	-1.34673719
13-Feb-07	1577.32	432.35	1576.32	431.35	486.04056	-54.69056	62.28207	-1.138808416
14-Feb-07	1570.89	438.55	1569.89	437.55	484.06012	-46.51012	62.28207	-1.339107919
15-Feb-07	1569.28	442.25	1568.28	441.25	483.56424	-42.31424	62.28207	-1.471893859
19-Feb-07	1570.7	443.6	1569.7	442.6	484.0016	-41.4016	62.28207	-1.504339687
20-Feb-07	1549.07	444.35	1548.07	443.35	477.33956	-33.98956	62.28207	-1.832388239
21-Feb-07	1532.04	455	1531.04	454	472.09432	-18.09432	62.28207	-3.442078509
22-Feb-07	1554.83	454.7	1553.83	453.7	479.11364	-25.41364	62.28207	-2.450733937
23-Feb-07	1570.47	460.25	1569.47	459.25	483.93076	-24.68076	62.28207	-2.523506975
26-Feb-07	1592.1	470	1591.1	469	490.5928	-21.5928	62.28207	-2.88439063
27-Feb-07	1568.31	469	1567.31	468	483.26548	-15.26548	62.28207	-4.079928702
28-Feb-07	1560.49	442.5	1559.49	441.5	480.85692	-39.35692	62.28207	-1.582493498
1-Mar-07	1542.85	451.1	1541.85	450.1	475.4238	-25.3238	62.28207	-2.459428285
2-Mar-07	1618.3	443.45	1617.3	442.45	498.6624	-56.2124	62.28207	-1.107977421
5-Mar-07	1624.65	420.75	1623.65	419.75	500.6182	-80.8682	62.28207	-0.770167631
6-Mar-07	1609.39	419.25	1608.39	418.25	495.91812	-77.66812	62.28207	-0.801900059
7-Mar-07	1577.62	413.25	1576.62	412.25	486.13296	-73.88296	62.28207	-0.842982875
8-Mar-07	1554.38	427.75	1553.38	426.75	478.97504	-52.22504	62.28207	-1.192571035

9-Mar-07	1541.51	433.8	1540.51	432.8	475.01108	-42.21108	62.28207	-1.475491032
12-Mar-07	1521.87	435.5	1520.87	434.5	468.96196	-34.46196	62.28207	-1.807270103
13-Mar-07	1553.16	444.75	1552.16	443.75	478.59928	-34.84928	62.28207	-1.787183839
14-Mar-07	1596.41	429.95	1595.41	428.95	491.92028	-62.97028	62.28207	-0.989070876
15-Mar-07	1605.27	433.25	1604.27	432.25	494.64916	-62.39916	62.28207	-0.998123532
16-Mar-07	1589.43	430.55	1588.43	429.55	489.77044	-60.22044	62.28207	-1.034234722
19-Mar-07	1567.68	429.9	1566.68	428.9	483.07144	-54.17144	62.28207	-1.149721514
20-Mar-07	1547.87	423.45	1546.87	422.45	476.96996	-54.51996	62.28207	-1.142371895
21-Mar-07	1575.2	430.15	1574.2	429.15	485.3876	-56.2376	62.28207	-1.107480938
22-Mar-07	1542.21	442.05	1541.21	441.05	475.22668	-34.17668	62.28207	-1.82235577
23-Mar-07	1545.33	438.3	1544.33	437.3	476.18764	-38.88764	62.28207	-1.601590377
26-Mar-07	1557.37	441.8	1556.37	440.8	479.89596	-39.09596	62.28207	-1.593056418
28-Mar-07	1584.78	441.35	1583.78	440.35	488.33824	-47.98824	62.28207	-1.297861101
29-Mar-07	1562.52	439.95	1561.52	438.95	481.48216	-42.53216	62.28207	-1.464352387
30-Mar-07	1547.27	449.65	1546.27	448.65	476.78516	-28.13516	62.28207	-2.213673923
2-Apr-07	1535.88	423.9	1534.88	422.9	473.27704	-50.37704	62.28207	-1.236318569
3-Apr-07	1527.81	431.15	1526.81	430.15	470.79148	-40.64148	62.28207	-1.532475441
4-Apr-07	1492.5	438	1491.5	437	459.916	-22.916	62.28207	-2.717842119
5-Apr-07	1455.83	465.5	1454.83	464.5	448.62164	15.87836	62.28207	3.9224498
9-Apr-07	1470.54	493.45	1469.54	492.45	453.15232	39.29768	62.28207	1.584879056
10-Apr-07	1471.33	495.6	1470.33	494.6	453.39564	41.20436	62.28207	1.511540769
11-Apr-07	1468.88	511.5	1467.88	510.5	452.64104	57.85896	62.28207	1.076446414
12-Apr-07	1439.3	496.05	1438.3	495.05	443.5304	51.5196	62.28207	1.208900496
13-Apr-07	1465.4	511.2	1464.4	510.2	451.5692	58.6308	62.28207	1.06227563
16-Apr-07	1467.26	534.5	1466.26	533.5	452.14208	81.35792	62.28207	0.765531739
17-Apr-07	1459.35	527.95	1458.35	526.95	449.7058	77.2442	62.28207	0630092 6
18-Apr-07	1460.79	511.5	1459.79	510.5	450.14932	60.35068	62.28207	1.032002788
19-Apr-07	1446.6	505.8	1445.6	504.8	445.7788	59.0212	62.28207	1.055249131
20-Apr-07	1411.88	533.35	1410.88	532.35	435.08504	97.26496	62.28207	0.640334094
23-Apr-07	1425.11	557.1	1424.11	556.1	439.15988	116.94012	62.28207	0.532597966
24-Apr-07	1467.32	579.75	1466.32	578.75	452.16056	126.58944	62.28207	0.492000518
25-Apr-07	1411.84	571.15	1410.84	570.15	435.07272	135.07728	62.28207	0.461084721
26-Apr-07	1463.35	560.5	1462.35	559.5	450.9378	108.5622	62.28207	0.573699409
27-Apr-07	1511.48	537.25	1510.48	536.25	465.76184	70.48816	62.28207	0.883582009
30-Apr-07	1568.23	549.45	1567.23	548.45	483.24084	65.20916	62.28207	0.955112288
3-May-07	1592.15	556.9	1591.15	555.9	490.6082	65.2918	62.28207	0.9539034
4-May-07	1594.43	553.4	1593.43	552.4	491.31044	61.08956	62.28207	1.019520684
7-May-07	1565.62	552.45	1564.62	551.45	482.43696	69.01304	62.28207	0.902468142
8-May-07	1594.72	553.35	1593.72	552.35	491.39976	60.95024	62.28207	1.021851103
9-May-07	1577.7	562.35	1576.7	561.35	486.1576	75.1924	62.28207	0.828302727

10-May-07	1634.62	576.4	1633.62	575.4	503.68896	71.71104	62.28207	0.868514388
11-May-07	1657.02	569.6	1656.02	568.6	510.58816	58.01184	62.28207	1.073609629
								-25.87647628

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