LUND UNIVERSITY
School of Economics and Management

VALUE CREATION AND EARNINGS MANAGEMENT IN ACQUISITIONS

EVIDENCE FROM SCANDINAVIAN BIOPHARMACEUTICAL INDUSTRY

(Master thesis in Finance)

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Abstract

Title	Value creation and earnings management in acquisitions: evidence from the Scandinavian biopharmaceutical industry.
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Authors	Bui Dieu Huong and Kim Fredriksson
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Key words	Acquisitions, Event study, Short and long term performance, Earnings management, Biopharmaceutical, Scandinavian.
Purpose	This study aims to examine the value creation for the shareholders from acquisitions within the biopharmaceutical industry between the years 1999 to 2008. Moreover, this study is investigating whether the firms manipulate their earnings one year prior the acquisition.
Methodology	For the short term measure, we use an event study in both 3-day and 11- day event window of acquisition. Long term performance is received from the monthly calendar time abnormal return (MCTAR) approach. Lastly, earnings management is examined by using the Modified Jones model to detect abnormal (discretionary) accruals.

Conclusion

In our study we do not find any evidence that acquirers in general make any abnormal return in the 3 and 11 days around the announcement date. However, when splitting the result according to their size we do find statistical proof that large firms within the 3 days do create an abnormal return. Meanwhile the small companies show negative performance within 11 days around the announcement date. When measuring the long-term performance, through an equally weighted portfolio, our results indicate a slight better performance from our acquirers in all sizes compared with their equivalents. The size of the transaction value show that the higher cost paid the higher the abnormal return the large acquirer will receive, while the small companies' returns are affected negatively to the higher price paid. Concerning the earnings management it is mainly made by the large companies which have greater possibility to manipulate their earnings.

Table of Contents

1. Introduction

1.1 Background

During two last decades, merger and acquisition (M&A) have been one of the growing trends giving firms the opportunities to considerably enhance their degree of internationalization and market share. Regarding to economic aspects, several researches have examined reasons for M&A and their effects - whether M&A add, destroy, or merely redistribute value for the firms. Economic theory suggests some reasons such as economies of scale, economies of scope and the market for corporate control (Patricia, Andrew, and Sean, 2007). M&A not only affect the companies themselves but also the firm's employees, suppliers, shareholders and the whole economy. After M&A, the company attempts to downsize the labor force, which leads to unemployment and further affects the economy due to lower tax income. For the shareholders, the impact of M&A on their wealth is observed through changes in share prices. For the suppliers, they might be forgotten in the new organization if the acquirers choose their own suppliers.[1]

The biopharmaceutical industry - a global and mature industry – has also been growing through M&A. During the latest decade ended December 2009, there are 1,354 M&A announcements within the biopharmaceutical industry throughout the world with total price of more than 694 billion US dollars.[2] Due to the growing pressure from patent

1 http://finance.mapsofworld.com/merger-acquisition/impact.html 2010-04-10
2 http://www.tradingmarkets.com/news/press-release/ave_gsk_pfe_wye_ten-year-data-on-pharmaceutical-mergers-and-acquisitions-from-dealsearchonline-com-reveals-top-dea-872944.html 2010-04-10

losses and development of new drugs, it has been a growing trend to acquire future growth with M&A in this industry.

Catching up with the global M&A trend, the biopharmaceutical industry from Scandinavian market has also experienced many M&A transactions among the firms. Over the years from 1999 to 2008, a total number of 69 mergers and acquisitions are announced, of which there are 17 domestic transactions and 52 cross-border transactions. Sweden and Denmark account for 86% of total M&A transactions. The maximum transaction value recorded is 15.6 billion US dollars made by the Swedish acquirer AstraZeneca PLC and US target Medimmune Inc in 2007 (Reuter database).

One example which illustrates the M&A trend within biopharmaceutical industry in Scandinavian market is AstraZeneca, a global and integrated firm, is established by the merger between the Swedish firm Astra and the British firm Zeneca. Since 2005, AstraZeneca has experienced several acquisitions including Kudos Pharmaceuticals, Cambridge Antibody technology, Arrow Therapeutics Ltd and MedImmune Inc.

However, after making some acquisition transactions, AstraZeneca still has been facing difficulties in its operation, particularly in developing new future best-seller products. Moreover, at the beginning of the year 2010, AstraZeneca announce closure of the research and development section in Lund, which causes over 900 workers unemployed. As a part of a restructuring plan, two plants in England are also shutdown.[3]

AstraZeneca is just one example of a company which illustrates the general circumstances in the biopharmaceutical industry. The biopharmaceutical firms try to solve their future expansion and R&D development through M&A. However, they are still facing problematic operation. The question is if the acquisitions have created any value for the acquiring firms or just made the situation even worse.

[3] http://www.astrazeneca.se 2010-04-15

1.2 Problem discussion

Unlike the businesses in other industries, the biopharmaceutical industry is research-intensive, with an average R&D to sales ratio of 18% versus only 4% for manufacturing industry (Pharmaceutical Researchers and Manufacturers of America 2004). Therefore, the effects of merger and acquisition activity are prominent in this industry since most of the firms used M&A as an important strategy to grow R&D, shorten product lifecycle, save cost, and achieve international market shares.

Patricia, Andrew, and Sean (2007) finds that mergers for the large firms are a response to expected excess capacity due to patent expirations and gaps in a firm's product pipeline and mergers for small firms are primarily an exit strategy in response to financial trouble including few marketed products, low cash-sales ratio. The same conclusion can be drawn from Bill Little, president of Delta Marketing Dynamics, who states that patent losses and shortage of new product in the pipeline are the main reasons for the popularity of M&A in this certain industry.[4]

However, in terms of value creation after M&A transactions within biopharmaceutical industry, there has been increasing controversy surrounding the bidder and target firm. Ravenscraft and Long (2000) test an event study of 65 pharmaceutical mergers from 1985 to 1996 and find abnormal stock returns around the announcement date of 13.3% for the target firm, -2.1% for the bidding firms, but effects not significantly different from zero for the combined firms. Higgins and Rodriguez (2005) analyze 160 acquisitions and find positive announcement period abnormal returns to both the acquirer (3.9%) and to the target firm (16%). For the long term, Mitchell and Stafford (2000) performs a test on 2,068 M&A transactions between 1961 and 1993 and find negative mean abnormal monthly returns over three years of -0.04% and -0.03% for equal weighted and value weighted M&A portfolios, respectively. Eckbo et al (1990) analyzes 182 acquiring firms over the years 1964 to 1982 and also finds positive abnormal returns. However, their studies in the long term are not conducted on the biopharmaceutical firm sample.

[4] http://www.deltamarketingdynamics.com 2010-04-17

Prior to the acquisition, managers might have incentive to manipulate the company's result upward or downward which is called earnings management. If an acquirer can increase the share price before the transaction and use those share as a mean of payment, then the earnings management can affect a lower price for the acquisitions (Evangelos, Costas and Antonios, 2005). This action could lead to tremendous losses for lenders and investors.

The evidence of earnings management has been documented in a few M&A events but not in biopharmaceutical industry. Easter Wood (1998) and Erickson and Wang (1999) investigate and find earnings management evidence in both hostile takeover and in stock for stock mergers. Evangelos (2005) find weak evidence of earnings management by acquiring firms in Greece in the year prior to the announcement and the completion of the deal.

Based on the discussion above, this paper aims to find the answer for the remained research questions within biopharmaceutical industry. Whether acquisition creates value for the acquirer both in the short and long term and whether value creation is affected by earnings management?

1.3 Purpose

The main purpose of this paper is to determine to what extend acquisitions are value creating for the bidders in both short and long-term. The second aim is to examine whether the acquirers make earnings management prior to the acquisition and to find the relationship between earnings management and value creation.

1.4 Limitation

In our study, we examine the impact of event on the firm's performance which requires the firm's existence both before and after the event happens. In the acquisition

transaction, the acquirer still remains following the acquisition while the target ceases to exist. In the merger activity, two firms combine together to form a new entity rather than remain separately owned, which means that only the newly-formed entity exists after the merger. Therefore, this paper only focuses on the acquisition transaction and analyzes the takeover effect for the acquirers.

1.5 Thesis outline

The remainder of this paper is organized into five chapters:

Chapter 2: This chapter presents data collection and an overview of event study methodology, long term approach, and earnings management model.

Chapter 3: Chapter three gives an overview of theoretical framework related to value creation and earnings management in M&A transactions.

Chapter 4: Chapter four shows the empirical findings and analysis following the methodology presented previously.

Chapter 5: Chapter five outlines the summary and conclusion of this research and opens for further research related to value creation and earnings management.

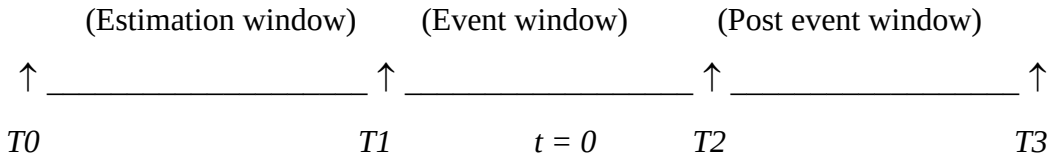
2. Methodology

This paper applies event study to examine whether takeover transaction adds a significant positive value for the acquiring firm in the short term. We also analyze the long term performance by employing calendar time approach. After that, we investigate if there is existence of the earnings management in the acquiring firms and find the relationship between the long term performance and the earnings management.

2.1 Event study methodology

Event study is a research method which has been implemented in financial service studies to measure the impact of changes in corporate policy. Event study measures abnormal changes in stock prices of publicly traded companies occurring in conjunction with an "event" (Brown and Warner, 1985; Wells, 2004). The researcher observes the actual stock returns over the period of interest and computes the difference between these returns and the expected returns. If the results are significantly different from zero, it might be concluded that the event impacts on the stock returns and creates value for the firm. There are a number of attractive features in event study methodology. Firstly, the data relies on the well-respected efficient market hypothesis; secondly, data is often public; thirdly, the data is not subject to industry sensitivity since abnormal returns are calculated, enabling a large range of industries to be studied (Cording, Christmann, and Bourgeois, 2002).

The first step is to specify the event window and the estimation window which will be used to analyze the impact of event on equity return. We define t = 0 as the event date. The event window (T1+1 to T2) is defined as the period over which the stock prices of the firms involved in the event should be estimated. In practice, the event window often includes the day (or the period) before the event, the day of event and the day (or the period) after the event. This event window captures the price effects around the announcement date. The estimation window (T0+1 to T1) is the period prior to the event window. These two windows do not typically overlap. The estimation window and the event window contain L1 and L2 observations, respectively. T2 to T3 is defined as the post event window.



2.1.1 Measuring normal returns

Before measuring normal returns, the firms' stock prices will be evaluated. The rate of return on security i on day t is calculated as follow:

$$R_{it} = \text{Ln}\ \frac{P_{it}}{P_{it-1}} \qquad (2.1)$$

where R_{it} is the rate of return on security i on day t, P_{it} is the daily stock price on security i on day t and P_{it-1} is the daily stock price on security i on day t-1.

The normal return is defined as the expected return if the event does not happen. A number of models are available to measure the normal return of security. In our study, the market model is employed since this model presents a potential improvement.

The market model reduces the variance of the abnormal return by removing the portion of the return related to variation in the market's return, which increases the ability to detect

event effects. We applied the market model for our research in stead of multifactor model since the gains from the latter one for event study are limited. The reason for this is that "the marginal explanatory power of additional factors beyond the market factor is small, and hence there is little reduction in the variance of the abnormal return" (MacKinlay, 1997).

For any security i we have

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad (2.2)$$

where R_{mt} is the market return; ε_{it} is the zero mean disturbance term. The parameters α_i, β_i are estimated by applying OLS on the observations in the estimation window.

To proxy for our market portfolio, OMX Nordic market is employed since this market presents all the listing firms in Scandinavian region excluding Norway. However, because OMX Nordic was just founded in 2003, we use the Stockholm Stock market which presents listed Swedish firms for the period from 1998 to 2002. Although these two markets do not present all the Scandinavian countries, both of them are still large enough to proxy for our sample since Danish and Swedish firms account for more than 90% of transactions.

2.1.2 Measuring abnormal return

The above market model estimated for normal performance can be expressed as:

$$R_i = X_i \theta_i + \varepsilon_i \qquad (2.3)$$

where $R_i = [R_{iTo+1} ..... R_{iT1}]'$ is an (L1x1) vector of return in estimation window for event i, X_i is an (L1xK+1) matrix of K explanatory variables of the model in addition to a vector of ones in the first column for the intercept and θ_i is a (K+1x1) vector of parameter. For the market model, we have $X_i = [l \quad R_m \quad]'$, $\theta_i = [\alpha_i \quad \beta_i \quad]$. The parameters are estimated by OLS as follow:

$$\hat{\theta}_i = (X_i' X_i)^{-1} X_i' R_i \tag{2.4}$$

$$\hat{\sigma}_{\varepsilon i}^2 = \frac{1}{L1-2} \varepsilon_i' \varepsilon_i \tag{2.5}$$

The abnormal return is the difference between the actual return and the normal return.

$$\varepsilon_i^* = R_i^* - X_i^* \hat{\theta}_i \tag{2.6}$$

where $R_i^* = [R_{iT1+1} ..... R_{iT2}]'$ is an (L2x1) vector of returns in event window, X_i^* is an (L2xK+1) matrix with the vector of observations on the explanatory variables in the event window (containing a vector of ones in the first column).

2.1.3 Estimating aggregate abnormal returns

To analyze the overall references for the event analysis, the abnormal returns should be aggregated through time and across securities. We define CAR_i (s_1, s_2) as the cumulative abnormal return for security i over period from s_1 to s_2, where $T1 < s_1 \leq s_2 \leq T2$, then $\hat{CAR}_i$ (s_1, s_2) $\equiv \gamma' \hat{\varepsilon}_i^*$ of which γ is an (L2x1) vector of ones in positions s_1 - T1 to s_2 – T1 and zeroes elsewhere.

$$\text{Var } \hat{CAR}_i(s_1, s_2) = \sigma_i^2(s_1, s_2) = \gamma' V_i \gamma \tag{2.7}$$

To aggregate across securities and through time, we assume that there is not any clustering and overlap in the event windows of included securities. We define $\overline{CAR}$ (s_1, s_2) as the average over N securities from s_1 to s_2:

$$\overline{CAR}\ (s_1, s_2) = \frac{1}{N} \sum_{i=1}^{N} \hat{CARi}(s_1, s_2) \tag{2.8}$$

$$\text{Var } \overline{CAR}\ (s_1, s_2) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_i^2(s_1, s_2) \tag{2.9}$$

If $\overline{CAR}$ (s_1, s_2) is significantly different from zero, it means that the unanticipated event has effect on the cumulative abnormal returns over securities. We can test Ho by using:

$$J = \left(\frac{\overline{CAR(s_1, s_2)}}{\overline{\sigma(s_1, s_2)}}\right) \tag{2.10}$$

Because the abnormal return might not represent a normal distribution, we also use two non-parametric tests, the sign test and the rank test, which are not subject to specific assumptions of return distribution.

The sign test, based on the sign of the abnormal return at the event date, requires that the expected proportion of positive abnormal returns under the null hypothesis is 0.5.

$$J_{sign} = \left[\frac{N^+}{N} - 0.5\right]\frac{N^{1/2}}{0.5} \sim N(0,1) \tag{2.11}$$

where N^+ is the positive abnormal return and N is the total number of cases.

The rank test is based on the rank of the abnormal return over the event window.

$$J_{rank} = \frac{1}{N}\sum_{i=1}^{N}(K_{i0} - \frac{L_2 + 1}{2}) / s(L_2) \tag{2.12}$$

$$s(L_2) = \sqrt{\frac{1}{L_2}\sum_{t=T1+1}^{T2}\left(\frac{1}{N}\sum_{i=1}^{N}\left(K_{it} - \frac{L_2 + 1}{2}\right)\right)^2} \tag{2.13}$$

where K is the rank of the abnormal return on security i for event in period t; T1+1 to T2 is the event window; L2 is the observations in event window. The largest number of abnormal return gets the rank of 1, the second largest number gets the rank of 2 and so on.

2.2 Long term approach

When measuring the firm's performance in a long term horizon, it involves many possible considerations which create biased estimates for conducting abnormal returns and cumulating returns. In the short term, these problems are less important or do not occur (Kothari and Warner, 1997). When measuring the long term performance, cross sectional dependence of the sample returns also create inferences. According to Brav (2000), this cross sectional dependence raises problems which might lead to poor test statistics in some sample situations.

The usage of reference portfolios to estimate long-term abnormal returns can also be problematic since it typically creates biased test statistics. These biases can be divided into new listing bias, rebalancing bias, and skewness bias. New listing bias is created because the new firms do not have as long history as the old firms. Rebalancing bias occurs since the reference portfolios are calculated with the assumption of periodic rebalancing while the returns from the sample are without rebalancing. Skewness bias arises since the long run returns are positively skewed (Barber and Lyon, 1997).

Another potential problem might occur when event overlaps each other, meaning two different events happen within a specific time horizon and cause disturbances in their estimates. In our study, we conduct the test on both overlapping sample and non-overlapping sample and compare the result. The overlapping problem is interpreted as one acquirer made more than one acquisition over the time-horizon (1 year). To solve this overlapping problem, we simply keep the first acquisition and eliminate the ones which are taken place in the same year for each acquiring firms.

2.2.1 Long term model

Over the long horizon, the difference between benchmark model's estimates might be large, which makes the result sensitive in estimating the expected returns (Kothari and Warner, 1997). The failure to find an accurate model can lead to systematic biases and misspecifications (Fama and French, 1993).

There are two main standard methods used for measuring the long-horizon, including cumulative abnormal return (as mentioned in the short term) and the buy and hold approach, which both circumvent the new listing, rebalancing, and skewness biases. The buy-and-hold method measures the difference between the return on a buy and hold investment in the sample firm and the return on a reference portfolio. This model has been recommended since additively cumulated procedures are positively biased due to the bid-ask-spread. However, it also shows higher skewness than the regular cumulative abnormal return approach, which is the reason that we choose the cumulative abnormal return approach (Barber and Lyon, 1997; Fama and French 1998).

The researcher can choose either a calendar-time (CT) or an event time approach to measure long term performance. However, the regular event-study, as used in short-term performance, is not a sufficient model for estimating long term performance since when the event window grows, the risk for "the bad model problem" arises. The bad model problem states that no model can exactly tell us the true expected returns and even if there is a model giving us the unbiased estimates, it is still affected by deviation from the model prediction. This is not a problem in the short term perspective because the daily expected returns are close to zero and have therefore little effect on abnormal return (Fama, 1998).

For the above reasons, we firstly focus on calendar time approach to measure long run performance. Secondly, we apply monthly portfolios in calendar time (CTAR) since they are less affected by "the bad model" problem than daily constructed portfolios. Moreover, the monthly portfolios also eliminate the cross-sectional dependence between the sampled firms, and the portfolio returns show fewer problems with statistical inferences (Fama, 1998; Barber and Lyon 1997).

In our study, we follow Fama's recommendation (1998) by using firm specific proxies for expected returns to further limit the bad model problem. We also include firm characteristics (i.e. size) in our proxy to make it more reliable as a comparison. In other words, if a company is listed in the large cap section, it will only be compared with the

average return of the other companies listed in the same section (i.e. large cap) and in the same industry (i.e. Nordic Health Care including Norway) which do not make any acquisition in the same period.

This paper employs the Mean Calendar-Time Abnormal Returns (MCTAR) model which is divided into equally weighted and value weighted returns and described in the following section.

2.2.2 The Mean Calendar-Time Abnormal Returns (MTCAR)

In this approach we calculate the abnormal return in each month (t) given by the difference between each security's return (R_i) and our constructed market return (R_{cpi}). The returns are calculated in the same manner as in the short term, i.e. by logarithmic procedure. Since we are examining the effect in a period of one year after the acquisition, the value creation will be measured in twelve months for each acquisition.

$$CTAR_{i,t} = R_{i,t} - R_{cpi,t} \tag{2.14}$$

In each month we calculate the mean return across the firms, each firm will be contributed to the mean return of the sample twelve months after its acquisition. This means the acquisitions co-interact with each other. Each observation is either given equal weight (w = 1/N) or value weighted abnormal return weight by $\frac{ME_{i,t-1}}{\sum_{i=1}^{N_t} ME_{i,t-1}}$ to measure the abnormal return:

$$\overline{CTAR_t} = \sum_{i=1}^{Nt} w_{i,t} * CTAR_{i,t} \tag{2.15}$$

Finally, we calculate and combine the grand mean monthly abnormal return (MCTAR) from our equal weight and value weighted abnormal return:

$$MCTAR = \left(\frac{1}{T}\right)\sum_{i=1}^{T} \overline{CTAR_t} \tag{2.16}$$

2.3 Earnings management methodology (Modified Jones model)

In order to investigate whether firm's managers manipulate reported earnings prior to acquisition, a variety of methods such as the usage of accruals, changes in capital structure or changes in accounting principles can be employed (Evangelos, Costas and Antonios, 2005). This study examines the current accruals as the source of earnings management.

There exists a number of different accrual models, including total accruals (Healy, 1985), changes in total accruals (DeAngelo, 1986), Jones model (1991) or some of the modified Jones model used for detecting abnormal accruals. The power of these tests has been questioned throughout research literature. Thomas and Zhang (2000) examines the ability of detecting accruals from six different models and concludes that Jones model (1991) is the only model which has predictive ability to measure accruals. Furthermore, Guay *et al*. (1996) examined five different types of measures for accruals and states that all models reflect imprecision. However, they find that Jones model (1991), despite of its imperfections (i.e. not working in financial crises), is the only one which shows significantly better results than its counterparts in detecting discretionary accruals. In this paper we specifically use the modified Jones model, which is developed by Dechow et al. (1995) as a way to eliminate the original Jones model's inability to work in crises. According to Dechow, Sloan, and Sweeney (1995), the modified Jones model provides the most power for detecting accruals management.

The modified Jones model distinguishes between normal (non-discretionary) and abnormal (discretionary) accruals. This model first estimates normal accruals as a fraction of lagged assets from the following equation:

$$\frac{TAC_{it}}{TA_{it-1}} = \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{\Delta Sales_{it}}{TA_{it-1}} + \alpha_3 \frac{PPE_{it}}{TA_{it-1}} \qquad (2.17)$$

where:

- TAC_{it} = Total accruals for firm *i* in year *t*;

- TA_{it-1} = total assets at the beginning of year *t* for firm *i*;
- $\Delta Sales_{it}$ = the difference in sales between year *t-1* to year *t* for firm *i;*
- PPE_{it} = gross property, plant and equipment in year *t* for firm *i*;

Total accruals can be calculated from balance sheet data or cash flow statement of the firm. Hribar and Collins (2002) argue that "the cash flow statement is preferred in the presence of non-articulation events such as mergers and acquisitions resulting in changes to the balance sheet that do not flow through the income statement". Therefore, total accruals in our study are computed as the difference between earnings before extraordinary items and discontinued operations and cash flow from operating activities.

Every independent variable in equation 2.16 and 2.17 is gathered as cross-sectional approach for each year in the sample period since we do not have enough financial information to separate the accruals and cash flow components of earnings for each year if we run the time-series regression.

The discretionary (abnormal) accruals (or percentage discretionary accruals) which are calculated as actual accruals minus normal accruals are defined as:

$$\%DAC_{it} = \frac{TAC_{it}}{TA_{it-1}} - \left(\hat{\alpha}_1 \frac{1}{TA_{it-1}} + \hat{\alpha}_2 \frac{\Delta Sales_{it} - \Delta \mathrm{Re}ceivables}{TA_{it-1}} + \hat{\alpha}_3 \frac{PPE_{it}}{TA_{it-1}} \right) \quad (2.18)$$

The only difference between modified Jones model and its original one is the adjustment for changes in net receivables. This variable captures the extent to which the sale difference is due to aggressive recognition of questionable sales.

In our sample, the acquirers come from different countries in Scandinavian region and each firm reports its financial statement in its own country's currency. Therefore, in our analysis, we convert all the report data's currency to Swedish kronor (SEK) using the average exchange rate of the year of completion acquisition since Swedish acquirers accounts for half of total acquiring transactions.

2.4 Determination of the window

Firstly, we decide to choose announcement date as the event date in event study method since we assume markets are efficient (Miller, 1999). If the stock prices reflect all public information in efficient market, then the price reaction to the acquisition will be immediately incorporated at the announcement date.

To examine the short term effects surrounding the event, we define the event of interest. According to Brown and Warner (1980, 1985), a long event window will reduce the power of test statistic, which leads to false inferences about the significance of an event. In addition, empirical evidence showed that the significance effect of an event will be captured by a short event window (Netter and Ryngaert, 1990). We use the usual three-day event window (-1, +1) around announcement date since the investor's reaction is concentrated in these three days. Moreover, we expand our event window to 11 days (-5, +5) since this window is long enough to capture the significant effect of an event and short enough to exclude confounding effect (McWilliams and Siegel, 1997). The reason to divide this analysis into several event windows is to capture different effects related to acquisitions, thus providing a more thorough analysis.

Our estimation window is identified as 180 trading days prior to the announcement date. According to Well (2004), this is a typical window in research using market model and sufficient in formulating a benchmark for normal return.

We use one year period following the completion date of acquisition to analyze the long term performance. To examine the effect of earnings management, the data for one year period prior to the completion date and the year of acquisition are employed.

2.5 Data collection

All the data used is obtained from the Reuters database, Datastream and annual reports issued by each acquirers. The stock prices and the list of acquisitions including

announcement date, name of target and acquirer, country of target and acquirer, and transaction value are gathered from ReuterDatabase. The accounting data for each of the acquirer including total assets, total accruals, receivables, sales, fixed assets is obtained from acquirer's annual report. Acquirer and target firms with no available data are disregarded.

Data on completed acquisitions from 1999 to 2008 with acquirers from Denmark, Finland, Norway and Sweden is collected. Our initial sample consists of 69 acquisition transactions. However, we disregard nine acquisitions announced in the same day from the same company (Meda AB, H Lundbeck) to prevent confounding effect and overlapping problem when conducting event study. Other 19 acquisitions (eight from Denmark, six from Sweden, three from Norway and one from Finland) are left out since the acquirers are not listed on stock exchange. This leads to final sample of 49 observations with acquirers from Scandinavian biopharmaceutical firms. These acquisitions could be the domestic transactions or cross border transactions with no limited for target region.

The sample period from 1999 to 2008 is explained mainly by the availability of data on acquisitions from ReuterDatabase. The acquisition transactions collected within Scandinavian region are only available from 1999. We end the period with the year 2008 since the stock prices for long term performance and the annual reports for earnings management analysis are required one year after the completion date of acquisition.

In general, all of our selected observations must meet the following requirements (Cybo-Ottone and Murgia, 2000; Kusnadi and Sohrabian, 1999):

(1) The transaction was announced between January 1, 1999 and December 31, 2008.
(2) The acquirer's stocks are currently listed on either OMX Nordic or Norwegian Stock Market (the acquirers must come from Scandinavian region).
(3) The daily stock price for the acquiring firms must be available one year before and one year after the event date.

(4) The information related to acquisitions, such as announcement date, completion date, and transaction value is publicly available.
(5) The accounting data from acquirers must be available one year prior to the completion date and at the year of completion date.
(6) All of the acquisition transactions must be already completed.

The final sample consists of 49 acquisition events, of which 06 transactions are classified as domestic transaction and 43 events are cross-border deal. Most of transactions are taken place in Sweden and Denmark which account for 90% of total transaction.

The table below presents all of transactions in our sample which includes completion date, name of acquirer, name of target, country of acquirer, country of target and transaction value. The order of transaction is ranked according to the completion date with the earliest transaction at the number one.

No	Completion date	Acquirer	Target	Country of acquirer	Country of target	Transaction value (USD)
1	5/1/1999	Novo Nordisk	Profound Pharmaceuticals	Denmark	Denmark	25,963,878.00
2	5/10/2000	Medivir AB	Mimetrix Ltd	Sweden	United States	9,472,800.00
3	6/26/2000	Karo Bio AB	Novalon Pharmaceutical Corp	Sweden	India	78,210,000.00
4	11/1/2000	ALK-Abello A/S	Center Laboratories From Heska Corporation	Denmark	United Kingdom	6,400,000.00
5	11/4/2000	H Lundbeck A/S	Vis Farmaceutici Istituto Scientifico Delle Venezie Spa	Denmark	United States	32,498,076.00
6	12/4/2000	H Lundbeck A/S	CF Pharma Gyogyszergyarto Kft	Denmark	Denmark	121,056,722.00
7	1/10/2001	AstraZeneca PLC	Astra-IDL	Sweden	United States	19,770,114.90
8	2/2/2001	AstraZeneca PLC	Astra IDL	Sweden	Hungary	18,500,000.00
9	2/23/2001	H Lundbeck A/S	Lundbeck GmbH & Co	Denmark	Italy	99,657,375.00
10	3/21/2001	Neurosearch AS	Display Systems Biotech A/S	Denmark	Germany	3,539,493.00
11	8/15/2001	Novo Nordisk AS	TransTech Pharma Inc	Denmark	India	67,308,622.00
12	9/5/2001	AstraZeneca PLC	Bio-Therabel SA	Sweden	Denmark	55,789,215.00
13	12/13/2001	Novo Nordisk A/S	Biobras SA	Denmark	Sweden	31,920,601.00
14	7/1/2002	Orion Corporation	Kronans Droghandel AB	Finland	Brazil	52,688,525.00
15	2/26/2003	Novo Nordisk A/S	Biobras SA	Denmark	Brazil	36,414,565.00
16	3/6/2003	H Lundbeck A/S	Synaptic Pharmaceutical Corp	Denmark	Sweden	121,000,000.00
17	4/29/2003	Novo Nordisk IT AS	e-sense	Denmark	Brazil	22,999,654.00
18	5/13/2003	Bavarian Nordic	GTB GenTherapeutika Berlin-Buch GmbH	Denmark	United States	7,426,709.00
19	3/29/2004	Meda AB	Ipex Medical AB	Sweden	Denmark	18,336,127.00
20	9/29/2005	Meda AB	Viatris GmbH & Co KG	Sweden	Norway	927,262,500.00
21	12/19/2005	Diamyd Medical AB	Nurel Therapeutics Inc	Sweden	Germany	1,290,598.98
22	1/26/2006	AstraZeneca PLC	Kudos Pharmaceuticals Ltd	Sweden	Italy	210,000,000.00
23	1/31/2006	VitroLife AB	Swemed Lab International AB	Sweden	United States	12,416,249.00
24	2/15/2006	ALK-Abello A/S	ALK-SCHERAX Arzneimittel GmbH	Denmark	Germany	47,820,000.00
25	2/23/2006	Orion Corporation	Lyocentre Nordic AB OYs business operations	Finland	Germany	147,890,000.00
26	3/6/2006	BioPorto A/S	DiaCdem Technologies GmbH	Denmark	United Kingdom	254,986,666.00
27	8/22/2006	AstraZeneca Ltd	Cambridge Antibody Tech Group PLC	Sweden	Finland	8,243,481,343.00
28	10/23/2006	Neurosearch A/S	Carlsson Research AB	Denmark	Germany	34,761,087.00
29	10/23/2006	Biolin AB	Integration Diagnostics Ltd	Sweden	Sweden	3,421,377.00
30	11/9/2006	Meda AB	3M's European Pharmaceutical Division	Sweden	United Kingdom	837,860,105.00
31	1/31/2007	Novo Nordisk A/S	PHARMAPLAN GMBH	Denmark	Sweden	55,783,211.00
32	3/2/2007	Biolin AB	KSV Instruments Ltd.	Sweden	United States	1,944,825.00
33	3/19/2007	AstraZeneca PLC	Arrow Therapeutics Ltd	Sweden	United Kingdom	150,000,000.00
34	4/2/2007	NorDiag ASA	Genpoint AS	Norway	Germany	13,547,579.17
35	6/18/2007	Topo Target A/S	Apoxis SA	Denmark	United Kingdom	19,338,530.00
36	6/27/2007	AstraZeneca PLC	Medimmune Inc	Sweden	USA	15,651,507,408.00
37	8/22/2007	Meda AB	MedPointe Inc	Sweden	United States	792,413,481.00
38	10/5/2007	Navamedic ASA	Vitaflo Scandinavia AB	Norway	Faroe Islands	12,905,076.00
39	11/16/2007	Orexo AB	Biolipox AB	Sweden	Germany	12,102,639,501.00
40	11/23/2007	Meda AB	Recip AB	Sweden	Sweden	1,292,779.79
41	12/13/2007	BioPhausia AB	All-Gen Pharmaceuticals & Generics B.V.	Sweden	United States	877,110.00
42	1/31/2008	Vitrolife AB	ATS Srl	Sweden	Sweden	6,798,000.00
43	3/7/2008	Genmab	Antibody Manufacturing Facility of PDL BioPharma Inc	Denmark	Netherlands	240,000,000.00
44	3/13/2008	Meda AB	Ellem Lakemedel AB	Sweden	Italy	23,099,471.00
45	4/1/2008	Medi-Cult AS	Stefan Gueck Zellkulturbedarf GmbH	Denmark	United States	15,403,725.00
46	7/4/2008	Vitrolife AB	ATS Srl	Sweden	Sweden	66,832,098.00
47	9/11/2008	Meda AB	Medi-Cult Italia SpA	Sweden	Germany	37,832,533.00
48	11/7/2008	Medi-Cult A/S	MidAtlantic Diagnostics Inc	Denmark	Switzerland	15,381,450.00
49	11/14/2008	Biotie Therapies Oyj	Elbion GmbH	Finland	Switzerland	25,516,088.35

Table 2.1 Acquisition events *Source: Reuters 3000 Xtra*

In our paper, we also classify the firms to large firm, medium firm and small firm in order to analyze the size effect. This classification is based on the classification of OMX Nordic for the firms in Sweden, Denmark and Finland. The Norwegian firms are listed on Norwegian Stock Market and sorted according to the market value.

- Large Cap: the firms with market value over 1 billion Euro
- Mid Cap: the firms with market value between 150 million and 1 billion Euro
- Small Cap: the firms with market value under 150 million Euro

(Source: Wilke, Sanden, Malmqvist and Jansson (2006), Spara smartare, p.50)

There are only five observations within medium firm group which might lead to inaccurate assumptions in our study when we come to analyze the impact of acquisition on medium firms. However, these results can still be used as reference for our study.

Large firm	Medium firm	Small firm
Astra Zeneca PLC	ALK-Abello A/S	Biolin AB
Genmab	Bavarian Nordic Institute	BioPhausia AB
H Lundbeck A/S	Neurosearch AS	BioPorto A/S
Meda AB		Biotie Therapeis Oyj
Novo Nordisk A/S		Diamyd Medical AB
Orion Corporation		Karo Bio AB
		Medi-Cult AS (origio)
		Medivir AB
		Navamedic ASA
		NorDiag ASA
		Orexo AB
		Topo Target A/S
		VitroLife AB

Table 2.2: Acquirer's size

2.6 Methodological problems

When examining the impact of results, two concepts of validity and reliability are taken into account. Validity concerns whether the research truly measures what it aims to measure while reliability addresses whether the results are consistent overtime (Joppe, 2000).

2.6.1 Validity

Validity consists of internal and external aspects. Internal validity considers the legitimacy of the results including the way of collecting data and performing analysis. In our study, the research can be considered as internal valid since we collect data from the same database under the same methodology. Moreover, our observations are large enough to conduct the research.

External validity assumes that the result of study can be generalized to other samples. In fact, this study outcome is supposed to hold for Scandinavian acquirers within biopharmaceutical industry. When applying for other groups or countries, the results may differ due to different industries, different effect factors, or different economic conditions.

2.6.2 Reliability

The reliability of a study depends on the reliability of the data and methodology. Our data is secondary data collected from Reuter database and Datastream. All of the firm's annual reports that we use are audited. Moreover, an intensive research through diverse websites, stock market, newspapers, financial magazines such as The Wall Street Journal, the Financial Times, Dagens industri, OMX Nordic website, Norwegian Stock Market website is undertaken. The data was thoroughly double checked from different resources in order to reduce the probability of errors in the sample data.

We use event study methodology, calendar-time approach and modified Jones model to conduct our test. All of three models have been well known since long time ago and tested in a lot of empirical researches. However, these models are sensitive to the choice of benchmark and require some assumptions when conducting our test.

3. Theoretical framework

3.1 Assumption on identification of abnormal returns

3.1.1 Market efficiency

This assumption is basic for event study methodology. Market efficiency implies that stock prices incorporate all relevant available information to the traders. Therefore, a researcher can identify significant events by measuring their impact on stock prices. Because of the instantaneously effects on the stock prices, the market efficiency assumption is difficult to reconcile over a long event window. The use of very long event window implies that some researchers do not believe that the event effects quickly impact on the stock prices. This can be interpreted as a violation of market efficiency assumption. In some circumstances, it might be assumed that the effects would not be realized during short period. In this case, the researchers are obligated to explain why the information is revealed to investors slowly. Otherwise, applying event study methodology is inappropriate (McWilliams and Siegel, 1997).

According to Fama (1970), the efficient market hypothesis is divided into three different degrees of efficiencies: the weak form, semi-strong form and the strong form. Event study methodology applies semi-strong form in its test. In semi-strong form, stock prices respond immediately and fully to all publicly available information including announcement or occurrence of an event. In this case, neither technical analysis nor fundamental analysis can create abnormal return. Consequently, trading investors are incapable of predicting stock price through media or firm's financial statements.

3.1.2 Unanticipated event

In event study, abnormal return can be interpreted as the response of the stock market to new information. It is possible that an event will be anticipated or information leaked to the market before a formal announcement. Such leakages cause event study method problematic since it is difficult to determine when new information affects traders. Therefore, it may be important to assume that the event were unanticipated (McWilliams and Siegel, 1997).

3.1.3 Confounding effects

It is assumed that the effect of an event has been isolated from the effects of other events. This third assumption shows that there are no confounding effects from other events. Confounding events may consist of the dividend announcement, launching new product, announcement of unexpected earnings, or a change in management board. These events might affect the stock price during the event window. The longer the event window, the more difficult for researchers to control the confounding effects (McWilliams and Siegel, 1997).

3.2 Theoretical predictions of an acquisition/merger announcement

The theoretical predictions of an acquisition announcement are defined to analyze the reaction of stock market to the acquisition announcement using event study methodology. According to Archbold (2000) and Boonpramote (2004), the merger/acquisition outcomes are classified into two groups: neoclassical theory and managerial theories.

3.2.1 Neoclassical theories

Neoclassical theories assume that all firms aim to maximize their earnings. An acquisition will bring more profit for the firms. This acquisition is predicted to increase the stock price since the expected higher future profits will be reflected in the share price. An acquisition might increase the efficiency or market power of the firms.

The increased efficiency theory expects that the new combined firm after merger or acquisition will perform more efficiently than the previously separated firms since this combination create synergies which lowering the production cost of the firm. Thus, the acquiring firm's stock price is expected to increase due to expected higher profitability.

Furthermore, after an acquisition, firm might increase the market power which implies that the new firm will have a higher possibility to control and raise the product's price on the market. The price increase will result in higher profit for the acquirer and thus increase the stock price.

3.2.2 Managerial theories

According to Roller et al (2000), it is not always the case an acquisition increases profit for the firms. The managerial hypothesis shows that there are differences between the interests of the owners (shareholders) and the managers who are hired by the owners to run the company. The owners might want to maximize the profit but the managers want to maximize their own interest such as increasing their salary or decreasing the risk of losing their job or their position. The conflict interests between manager and the owner results in pushing the acquisition for the wrong purpose which leads to reduce efficiency and profitability of the firms.

The hubris hypothesis assumes that the manager is overconfident in valuing the acquired target and thus overestimates the value of the target and as a consequence pays too much more for the acquired shares than the market expectation. This implies that the acquisition brings benefit for the target shareholder but the acquiring firm's shareholder looses.

3.3 Critical view on earnings management

One of the most important decisions for firm is whether and when to invest the firm's resources in acquisitions. Therefore, it is critical to understand management's motivation

in this decision as well as to evaluate decision quality (Roll, 1986). The basic underlying reason for this acquiring decision is the growth prospects. Acquisition can be interpreted as a way to confront foreign competition and create powerful enterprises (Evangelos, Costas, and Antonios, 2005).

Before an acquisition, the acquirer and target value are estimated. Both participants seem to have strong incentives to manage earnings upward. According to Erickson and Wang (1999), the relation between share price and share issued of acquiring firm in the transaction generates incentives for the acquirer to increase accounting earnings before an acquisition in order to raise the market share price. In this case, the earnings manipulation can affect a lower price for the acquisition if an acquirers use their shares as an exchange payment. In addition, higher share price will minimize the likelihood of earnings dilution.

However, bidder and target firms may decide not to make earnings management if the cost of manipulating earnings exceeds the cost of undoing earnings management (Watt and Zimmerman, 1990). The earnings manipulation cost might include the cost of hiring advisors and auditors who are expert in earnings management technique. In case the acquirer may detect earnings management in target firms and vice versa, both of them may bear the cost of threatening to cancel the transaction or changing the transaction price (Erickson and Wang, 1999).

3.4 Previous literature

None of the previous literature studies both value creation and earnings management. Therefore, we first mention some researches on value creation in the short term and in the long term. Studies on earnings management are mentioned following that.

Related to biopharmaceutical industry, we find a variety of literature applying event study for short term value creation. Ravenscraft and Long (2000) examine 65 pharmaceutical mergers over the years 1985 to 1996 by applying event study method. Their result shows abnormal return around announcement date of -2.1% for the bidding

firm, 13.3% for the target firm but not significantly different from zero for the combined firms. Higgins and Rodruguez (2005) find the positive abnormal return of 3.9% for the acquirer and 16% for the target firm when conducting event study for sample of 160 acquisitions between 1994 and 2001. However, their studies fail to present the result in the long term.

The question of whether acquiring generating value in the long term still remains unclear in finance research and we find no research investigate this issue in the biopharmaceutical industry. Franks, Harris and Titman (1991) do the research on 399 acquisitions from many industries over the years 1975 to 1984 and they only find significant positive long term abnormal returns in small transactions.

Loderer and Martin (1992) find positive abnormal return over the five subsequent years for the acquirers after studying 155 acquisitions took place during 1965 to 1986 period. In contrast, Agrawal, Jaffe and Mandelker (1992) study 937 acquisitions between 1955 and 1987 and observe significant negative abnormal returns over the five subsequent years.

Rau and Vermaelen (1998) improve the long term model by adjusting firm's size and systematic risk as well as book to market ratio. They find that the three-year buy-and-hold abnormal returns are -4.04% for the mergers and 8.85% for the acquisitions.

Mitchell and Stafford (2000) perform a test on 2,068 M&A transactions between 1961 and 1993 by applying mean calendar time abnormal returns approach and find negative mean abnormal monthly returns over three years of -0.04% and -0.03% for equal weighted and value weighted M&A portfolios, respectively.

Eckbo, Giammarino, and Heinkel (1990) analyze 182 acquiring firms over the years 1964 to 1982 and find abnormal returns of 5.7% when financing acquisitions by cash and stocks and 2.7% with acquisitions financed by stock alone. For the cash payment, the abnormal returns are not significant.

When it comes to earnings management, there has been no evidence documented in the field of biopharmaceutical industry and only a few researches in M&A activities are investigated. The results of these studies provide mixed evidence about earnings management in acquisitions.

The first earnings management evidence related to corporate control contests is examined by Groff and Wright (1989). They find that managers of acquiring firm are more likely to select income increasing accounting choices during the years preceding acquisition announcement.

Erickson and Wang (1999) applying abnormal accruals model for a sample of 119 mergers over the years 1985-1990 investigate that acquirers manipulate earnings upward in the periods prior to merger announcement when the transactions use the stock as a mean of exchange. The degree of increasing income is positively related to the size of the merger.

North and O'Connel (2002) use modified Jones model (1991) of detecting earnings management for a sample of 321 acquisitions between 1990 and 1997 and find that managers of acquiring firms manipulate reported earnings upward in the quarter preceding and following the acquisition when they use the stock rather than cash payment. Finally, Louis research (1994) also draws the same conclusion that in the quarter before stock swap announcement, acquirers report significant positive abnormal accruals.

To our knowledge, previous literatures have showed mixed and sometimes contradicting results. In addition, these empirical studies fail to draw an overall picture of whether M&A create value in both long term and short term for the firms and examine the factor influencing the long term value (e.g earnings management), particularly in the biopharmaceutical industry.

4. Empirical results

Our final sample consists of 22 biopharmaceutical firms which create a total of 49 acquisitions transactions during the event period. First, we focus on analyzing the impact of acquisition event on the short term performance of those firms by applying event study methodology. Secondly, we further discover the firm's performance one year following the acquisitions. Lastly, we investigate whether earnings management is the factor affecting the firm's long term performance.

4.1 Impact of acquisition on short term performance

4.1.1. Impact of acquisition over acquiring firms

To analyze the impact of acquisition event on the short term performance of the acquirers, the cumulative abnormal returns (CAR) are calculated for the whole sample as well as for each of biopharmaceuticals firm. The investigated periods include three days event window (-1, +1) and eleven days (-5, +5).

We start by discussing short term performance over the whole sample. The cumulative abnormal returns are aggregated both across securities and through time. The results under different windows are presented in the table below.

Event window	CAR3	CAR11
Maximum	15.88%	19.72%
Minimum	-17.31%	-31.18%
Median	1.23%	0.15%
Average	0.63%	-0.49%
Test statistic	0.70	-0.36
J_{sign} test	1.00	0.14
J_{rank} test	1.32	0.54
Large firm (average)	2.02%**	2.09%
Mid firm (average)	-0.41%	+3.58%
Small firm (average)	-1.28%	-5.78%**

Table 4.1: Cumulative abnormal return for 3-day and 11-day event window

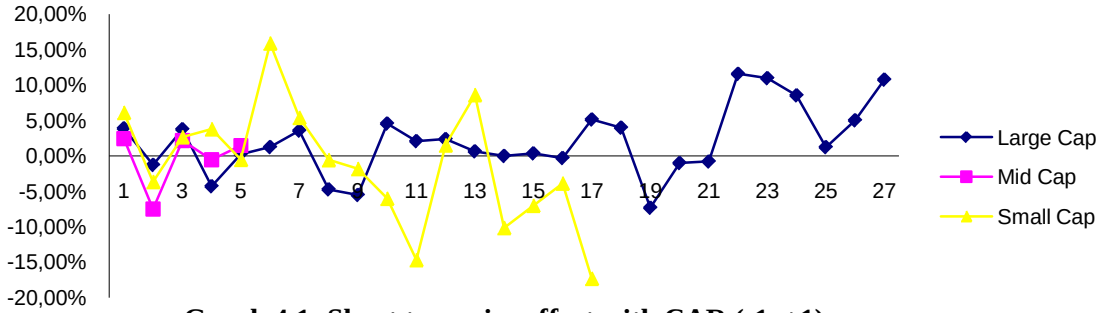
We find the positive average cumulative abnormal return for all the acquiring firms for three days event window and negative one for the 11 days event window. This can be interpreted as the share prices of acquiring firms are over-priced around three day of announcement date. However, none of the cumulative abnormal return over the whole sample shows statistical significance. But these results are not surprising since they confirm large number of previous researches (Asquith et al; Agrawal and Jaffe, 2000; Mc Williams and Siegel, 1997, Evangelos 2005). One reason for the insignificant result might be the difference in size between acquirers and targets. Given that the acquirers among biopharmaceutical firms are on average 20 times larger than the target firms, it would be expected to be difficult to detect significant abnormal returns around the announcement date of acquisition for the acquiring firms (Oliver and Ludwig, 2000).

In order to have a more accurate result for the overall sample, the sign test and rank test are also conducted in our paper. In the same manner, the tests present insignificant result which shows that there is no difference between the positive number of cumulative abnormal return and the negative number of cumulative abnormal return for each event windows. Result shows that acquisitions carried out from 1999 to 2008 did not have strong impact on value creation of biopharmaceutical firms.

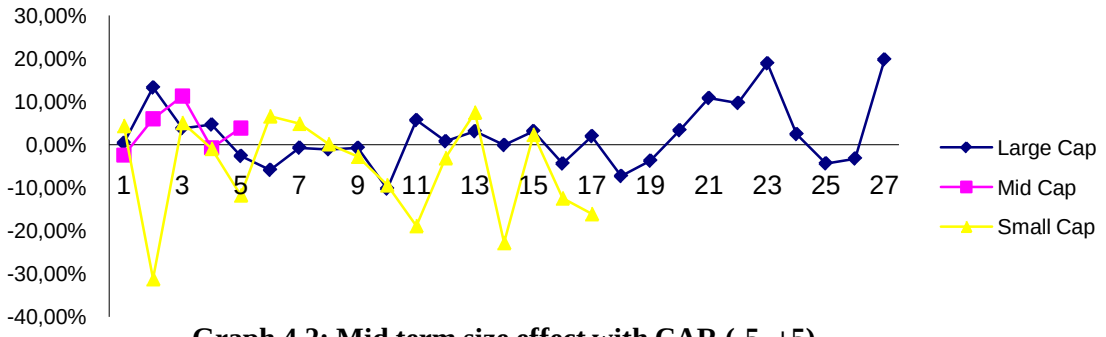
4.1.2 Size effect

In order to detect whether impact of acquisitions on the firm's value are different, we divide our acquiring companies into three groups consisting of the large firms, the medium firms and the small firms. For the large firms comprising of 27 transactions, the average cumulative abnormal return in the three-day event window is positive (+2.02%) and statistically significant at the 5% level. For the 11-day period, the result is still positive (+2.09%) but insignificant. It seems that the capital market reacts effectively to the large firms' announcement and the acquisition does create value for the large firms. This might be the case that the efficiency or the market power effect supports the acquisition. Patricia et al (2007) find that large firms are more likely to engage in M&A to enhance economies of scale in the biopharmaceutical industry. M&A might be expected to generate profit for large firms since it create excess capacity in the firm's sales and manufacture which is limited by the pipeline gaps or patent expiration.

For the medium firms including five transactions, the average abnormal return is -0.41% and +3.58% for the three-day and 11-day period respectively but none of them is significant. The small sample consisting of 17 acquisition events shows negative results under both of the event window, -1.28% and -5.78% respectively with 5% statistically significant level at the eleven day window. It can be seen that acquisition does not generate value for the small firms in the short term. The small firms even lose 5.78% return after the acquisition. It is possible that the managerial or hubris hypothesis dominates this acquisition.



Graph 4.1: Short term size effect with CAR (-1, +1)



Graph 4.2: Mid term size effect with CAR (-5, +5)

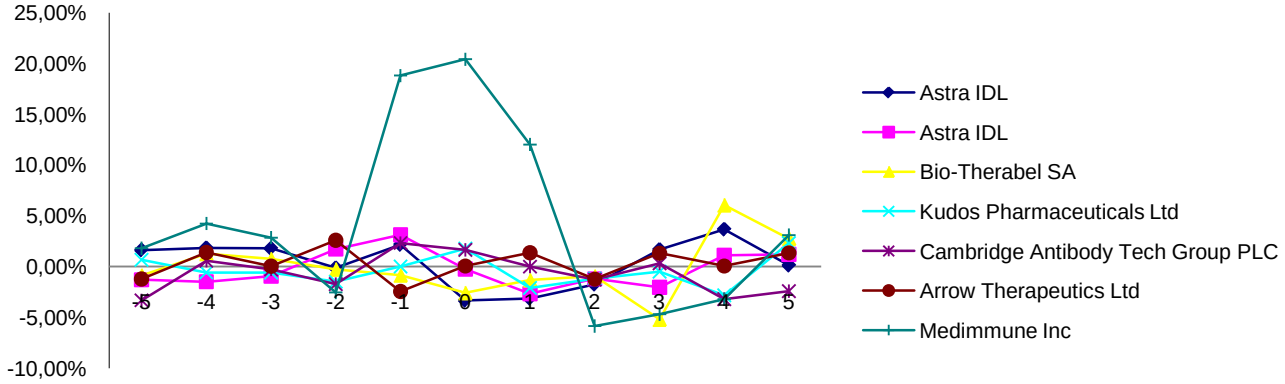
In general, our study fails to provide any evidence that acquisition create abnormal returns for the shareholders. However, when the results are divided into different categories, we do find statistically significant positive value for large firm and negative value for small firm. Because these values will eliminate each other when sum up for the whole sample, this probably explains why we can not find the result significantly different from zero overall.

It can be seen that different sizes generate different effect for the stock movement. Our large firms receive the positive market reaction while the small firms receive the opposite. One possible reason is that the large firms are more likely to acquire the matured and growth targets which create market power or market expansion after acquisition. Meanwhile, the small companies can only buy the other small, unknown or potential growth targets because of their limited financial ability. Since the small companies have this limited ability, investors might think that they also have a lower possibility in comparison with the large ones to develop the post-acquisition performance which might send the negative signal to the market expectation.

Another explanation is that the small firm's reputation or market historical experience is less than the large firm. Therefore, investors are more careful to the new information from small firms which might affect the stock price.

4.1.3 Impact of acquisition on individual acquiring firms

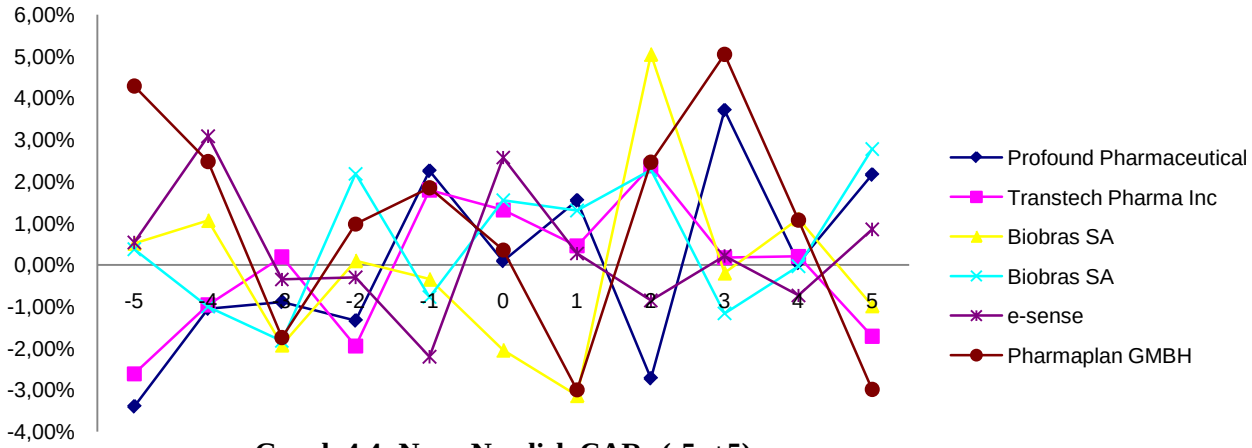
For each of acquiring firms, the acquisition event also has different impact on the firm performance. We begin with AstraZeneca PLC, which has total of seven transactions over the year 1999 to 2008, the largest number of the whole sample. Shareholders undoubtedly perceive positive abnormal return of 4.63% during 11 days around announcement date when AstraZeneca acquires Astra IDL Hungary, a company whose parent company based in India, in early 2000. The market reacts positively since AstraZeneca completes buying controlling stake of 51.5% of the whole Astra IDL after this deal.[5] However, the acquisition of Bio-Therabel SA in 2001 turns to be significantly negative abnormal return of -4.73% under three event window. The Cambridge Antibody Tech Group deal in 2006 has a negative abnormal return of -4.42% during 11-day event window. The acquisition of Arrow Therepeutics in 2007 gains 5.13% abnormal return. By far the most spectacular all-cash deal has been the take over of American-based biotech firm Medimmune Inc for approximately $15.6 billion in 2007. Medimmune is one of the largest companies in the biotechnology industry and one of the earliest to become profitable[6]. This takeover helps Astrazeneca to bolster its product pipeline and to take an important step for entering strategic market in American. The market highly appreciates this deal resulting in highest positive abnormal return of 11.57%, statistically significant at the 1% level. Two another deals with Astra IDL and Kudos Pharmaceutical have insignificant result. In total, nearly half of acquisition deals during 1999 to 2008 create value for AstraZeneca.



Graph 4.3: AstraZeneca CARs (-5, +5)

[5] http://www.astrazeneca.com/media/latest-press-releases/2001/377?itemId=3892685 2010-05-17
[6] http://www.nytimes.com/2007/04/24/business/24drug.html 2010-05-17

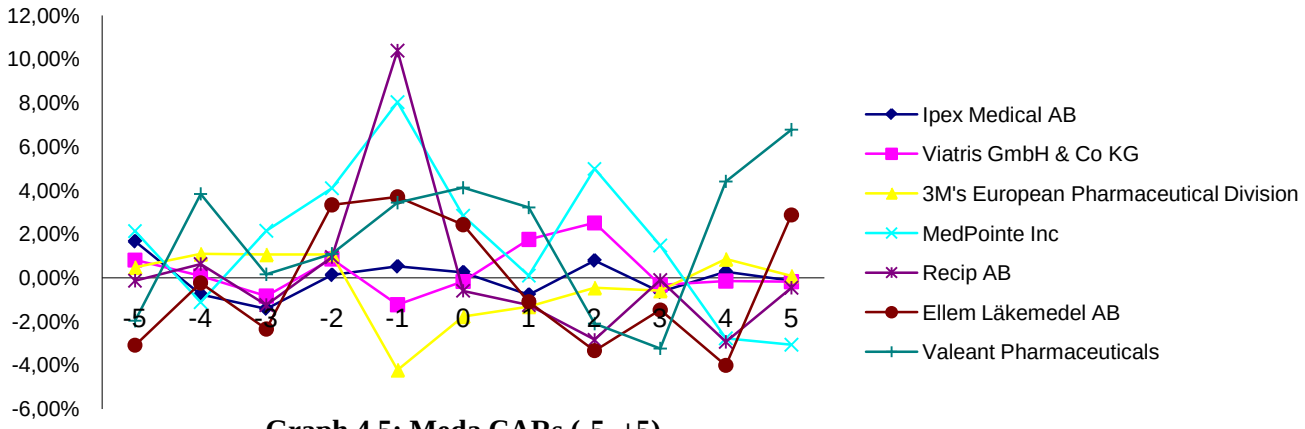
Apart from Biobras deal, Novo Nordisk seems to be a successful acquirer over the last 10 years since all of five transactions are positively absorbed by the capital market. Only transaction with Biobras Sweden in 2001 results in negative return of -5.52% at 1% confidence level. With the acquisition of E-sense and Biobras based in Brazil, Novo Nordisk expands its market to Latin American, particularly the market for diabetes product since Brazil is the largest market for this product in Latin Amercan.[7] Therefore, the market reacts quite positively with these acquisitions.



Graph 4.4: Novo Nordisk CARs (-5, +5)

Meda AB, one of the large acquirers with seven transaction events during the year 1998 to 2008, also experiences a significant gain in most of the takeovers. Except the deal with MedPointe Inc and Recip AB with insignificant result, all of other transactions give positive abnormal return for the shareholders around the announcement date. The highest return of 19.72% at 11-day event window is acquired by the deal with Valeant Pharmaceuticals taken place in 2008, which is significant at the 1% level. This acquisition helps Meda expand its business to Western and Eastern Europe, especially in the UK and Russia, and use those markets as platform to introduce its pipeline products[8].

[7] http://www.thepharmaletter.com/ 2010-05-21
[8] http://www.biospace.com/news_story.aspx?NewsEntityId=105546 2010-05-21



Graph 4.5: Meda CARs (-5, +5)

Besides three large firms with largest number of takeover transactions during the year 1999 to 2008, we also investigate acquisition impact for all of other firms in our sample. There are 20 statistically significant results under three-day event window and 28 significant ones under 11-day event window as shown in the following table:

Announcement Date	Acquirer	Target	CAR (-1, +1)	CAR (-5,+5)
5/1/1999	Novo Nordisk	Profound Pharmaceuticals	**3.88%*** **	0.39%
3/1/2000	Medivir AB	Mimetrix Ltd	**6.10%*** **	4.38%
3/27/2000	Karo Bio AB	Novalon Pharmaceutical Corp	-3.65%	**-31.18%*** **
6/26/2000	ALK-Abello A/S	Center Laboratories From Heska Corporation	2.42%	-2.44%
11/1/2000	H Lundbeck A/S	Vis Farmaceutici Istituto Scientifico Delle Venezie Spa	-1.28%	**13.23%*** **
11/4/2000	H Lundbeck A/S	CF Pharma Gyogyszergyarto Kft	3.76%	3.77%
1/1/2000	AstraZeneca PLC	Astra-IDL	-4.29%	**4.63%** **
2/2/2001	AstraZeneca PLC	Astra IDL	0.22%	-2.66%
2/23/2001	H Lundbeck A/S	Lundbeck GmbH & Co	1.24%	**-5.90%** **
3/21/2001	Neurosearch AS	Display Systems Biotech A/S	**-7.51%*** **	**6.01%** *
8/15/2001	Novo Nordisk AS	TransTech Pharma Inc	**3.56%*** **	-0.74%
9/5/2001	AstraZeneca PLC	Bio-Therabel SA	**-4.73%*** **	-1.11%
12/13/2001	Novo Nordisk A/S	Biobras SA	**-5.52%*** **	-0.78%
4/12/2002	Orion Corporation	Kronans Droghandel AB	4.56%	**-10.24%*** **
11/19/2002	Novo Nordisk A/S	Biobras SA	2.08%	**5.66%*** **
11/21/2002	H Lundbeck A/S	Synaptic Pharmaceutical Corp	2.37%	0.75%
4/29/2003	Novo Nordisk IT AS	e-sense	0.64%	**3.07%** **
5/13/2003	Bavarian Nordic	GTB GenTherapeutika Berlin-Buch GmbH	2.16%	**11.25%*** **
3/29/2004	Meda AB	Ipex Medical AB	-0.80%	**10.78%*** **
8/8/2005	Meda AB	Viatris GmbH & Co KG	**11.57%*** **	**9.60%*** **
11/22/2005	Diamyd Medical AB	Nurel Therapeutics Inc	2.66%	**5.08%*** **
12/23/2005	AstraZeneca PLC	Kudos Pharmaceuticals Ltd	-0.01%	-0.13%
1/26/2006	VitroLife AB	Swemed Lab International AB	3.78%	-0.93%
2/23/2006	Orion Corporation	ALK-SCHERAX Arzneimittel GmbH	0.35%	**3.11%*** **
12/13/2005	ALK-Abello A/S	Lyocentre Nordic AB OYs business operations	-0.56%	-0.74%
3/6/2006	BioPorto A/S	DiaCdem Technologies GmbH	-0.53%	**-11.74%*** **

5/14/2006	AstraZeneca UK Ltd	Cambridge Antibody Tech Group PLC	-0.30%	**-4.42%*** **
10/23/2006	Biolin AB	Carlsson Research AB	15.88%	6.61%
8/24/2006	Neurosearch A/S	Integration Diagnostics Ltd	1.45%	**3.81%*** **
11/9/2006	Meda AB	3M's European Pharmaceutical Division	**10.96%*** **	**18.84%*** **
1/31/2007	Biolin AB	Genpoint AS	**5.39%*** **	**4.89%** **
2/1/2007	AstraZeneca PLC	Arrow Therapeutics Ltd	**5.13%*** **	1.94%
3/2/2007	NorDiag ASA	KSV Instruments Ltd.	-0.57%	0.15%
12/19/2006	Novo Nordisk A/S	PHARMAPLAN GMBH	-0.8%	**10.78%*** **
4/23/2007	AstraZeneca PLC	Medimmune Inc	**17.32%*** **	**9.64%** **
4/11/2007	Topo Target A/S	Apoxis SA	**-1.82%*** **	**-2.75%*** **
7/20/2007	Meda AB	MedPointe Inc	8.54%	2.41%
8/22/2007	Navamedic ASA	Vitaflo Scandinavia AB	**-6.02%***	**-9.40%*** **
10/15/2007	Orexo AB	Biolipox AB	**-14.68%** **	**-18.86%*** **
11/16/2007	BioPhausia AB	All-Gen Pharmaceuticals & Generics B.V.	1.50%	-3.10%
10/25/2007	Meda AB	Recip AB	1.23%	-4.39%
1/31/2008	Vitrolife AB	ATS Srl	**8.60%*** **	**7.47%** **
3/7/2008	Medi-Cult AS (origio)	Antibody Manufacturing Facility of PDL BioPharma	**-10.15%** **	**-22.79%*** **
2/21/2008	Genmab	Ellem Lakemedel AB	-1.01%	**3.31%** **
2/26/2008	Meda AB	Ellem lakemedel AB	**5.02%** **	-3.26%
7/4/2008	Vitrolife AB	ATS Srl	**-7.01%*** **	2.34%
8/4/2008	Meda AB	Valean Pharmaceuticals	**10.76%*** **	**19.72%*** **
9/26/2008	Medi-Cult AS (origio)	MidAtlantic Diagnostics Inc	-3.88%	**-12.43%*** **
10/24/2008	Biotie Therapeis Oyj	elbion GmbH	**-17.31%** **	**-16.09%*** **

Table 4.2: Cumulative abnormal returns for individual firms.

There are some reasons for the negative value of abnormal return. One of the possible reasons is the managerial and hubris hypothesis dominating on the acquisition as mentioned before. One more explanation is taken from Mei and Sun (2008) that the bidder probably has already some percentages of shares (or controlling stake) of the target firm before M&A. Therefore any gains from M&A may already be reflected in the acquiring firm's stock price when the firm obtains stock before.

Our empirical results under two event windows validate three assumptions in the theoretical section. Firstly, our results are inconsistent with the market efficiency hypothesis which shows that the significant events instantaneously effects on the stock price and therefore the market efficiency assumption is difficult to reconcile over a long event window. However, in our results, the longer the event window is, the more number of significant results are generated in individual firms. For the whole sample, the results even are not significant over during the short and mid event window. These results

confirms many previous researches such as Mc William and Siegel (1997), Oliver et al (2007) who do not believe that the event effects quickly impact on the stock price.

Secondly, our study proves the unanticipated event assumption. The stock price changes and the abnormal returns generated after the announcement date of acquisition might be regarded as the reaction of stock market to new information of unanticipated event. To validate the last assumption, we eliminate all confounding effect by selecting the firms which did not announced any event or information such as financial report, dividend other than acquisition announcement during the event windows for our final sample. Therefore, our study can prove for the third assumption about confounding effects.

4.2 Impact of acquisitions on long-term performance

The long-term performance is based on the monthly calendar time abnormal returns (MCTAR) received from the stock performance. In specific, the abnormal returns are given by the difference between the acquirer's monthly returns and its corresponding market portfolio which we have constructed as the average return from the equivalent firms in the same industry and size.

The result of our study will be presented in following sections. In the same manner as the previous short-term performance, we firstly start by presenting the total picture, and secondly we divide the result according to the size effect to investigate if the bigger companies generate more value than the smaller after acquisition. In other words, the result will be reflected both from the acquirers (through size effect) and acquisition (through transaction value) point of view. In our analysis, the number in parentheses represents the non-overlapping result.

4.2.1 The long term performance – the total picture

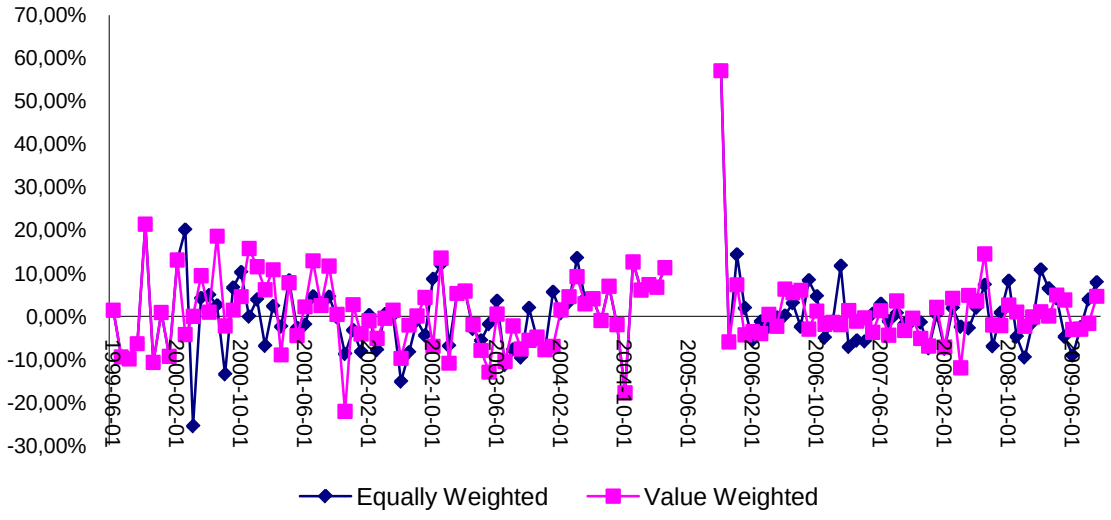
The result from our total picture view, which is described in the table 4.3 below, indicates that our acquisition does create value. Our equally weighted portfolio's stock performs a

1.14% (1.46%) higher than its equivalent firms. The value weighted portfolios, with 0.99% (0.43%), also indicate a better performance, even though it is slightly less than equally weighted portfolio. In other words, the higher transaction value (or cost of the acquisition) has had a negative impact on the long-term performance. When looking at the number of positive returns given below, one can conclude that the positive value equals the negative ones.

Equally Weighted		Value Weighted		Max (EW)	Min (EW)	Positive (month)
Overlap	Non-Overlap	Overlap	Non-Overlap	Overlap	Overlap	Overlap
1.14%	1.46%	0.99%	0.43%	57.07%	-25.56%	50.42%

Table 4.3: Long-term abnormal returns - Total picture.

Furthermore, by plotting the monthly abnormal returns from our equally and value weighted portfolios we can see that in most of the months, the return lies between the range of -10% to +10%. In some cases, our two different portfolios have the same value simply because only one acquisition was made in the corresponding month.



Graph 4.6: Monthly abnormal returns.

4.2.2 The long term performance – the size effect

When dividing the result into size effect, described in table 4.4, our study shows a slight difference among the companies. In our equally weighted portfolio, all of the three sections do create value for the firm. In Large Cap we have a 0.26% (0.34%) improvement and in our Mid Cap the result is even better with 0.46% (0.59%). The result from Small Cap is the best one when it comes to our equally weighted portfolio with 0.57% (2.18%) better result than its comparison. However, our value weighted portfolio shows a slightly different result. Both Large and Mid Cap give a higher result when put into the value weighted portfolio while the Small Cap implies a worse result. This result is even negative by -0.60%. In other words, our study tells that the higher transaction value in the bigger companies receives the higher return, and the opposite for the smaller companies. As noted in the table, we can see that it reveals quite the same result as in the total picture, when it comes to the share of positive months, with an equal split.

Size	Equally Weighted		Value Weighted		Max (EW)	Min (EW)	Positive
	Overlap	Non-Overlap	Overlap	Non-Overlap	Overlap	Overlap	Overlap
Large Cap	0.26%	0.18%	0.34%	-0.99%	57.07%	-18.84%	45.54%
Mid Cap	0.46%	0.46%	0.59%	0.59%	21.83%	-20.82%	53.85%
Small Cap	0.57%	2.18%	-0.60%	0.13%	44.44%	-51.08%	48.33%

Table 4.4: Long-term abnormal returns –size effect

To our knowledge, since the long-term performance from the biopharmaceutical industry has never been tested, our results cannot be directly compared with any previous findings. However if we look at acquisitions from a more general point of view, without an industry specific restriction, one can conclude that our result support some previous studies such as Loderer and Martin (1992) who also found positive abnormal return after the acquisition. Overall result indicates that our companies have been able to create value through acquiring new firms.

Even when sorted according to the transaction value, the study shows a slight better result than its equally weighted portfolio. In other words, the higher price paid, the higher return the shareholders receive, at least for the large companies. This implies that

although there is a bidding war between the biggest companies which pushes up the price on the acquisition, these acquisitions have been still able to create value for their shareholders.

When examining the effect for the smaller companies, we see a slight difference. When put into the equally weighted portfolio, the small firms experience the worst result in the short-term but actually perform the best during the long-term. The market reacts negatively to the acquisition announcement of small firm but in the long-run, the investors seem to take away their carefulness because of other factors such as quarterly report, dividend announcement which might trigger the stock price upward. It takes a longer time for small firm to receive positive market's reaction compared to the large firm.

However, when analyzing small firms by applying value weighted portfolio, we receive a worse result than firms in the same industry and same size. One possible reason for this contrary result might be payment procedure if the smaller companies are not able to pay by cash or might face difficulty of raising cheap external funding which can create a negative signal for the stock prices. If this is the case, the cost of debt will go up which further increases the probability of receiving nothing in case of a bad acquisition that might lead to bankruptcy.

4.3 Earnings management

Abnormal (discretionary) accruals have been used as a proxy of earnings management. They are interpreted as the percentage of total assets. Large values of discretionary accruals are indicated that earnings management occurs. Our appendix shows the result of discretionary accruals for each of firm in our sample. Positive (negative) discretionary accruals indicate income increasing (decreasing) management (Robert & Farshid, 2003). In our study, in order to ensure that the results are not driven by the firms' poor operating performance, most of the firms in our sample gain profit in their operation at the year of acquisition. Only some firms (Medivir AB, Genmab, Karo Bio AB, Biolin AB and Nordiag) experience loss which might not affect our result. Jones (1991) refers to the

poor performance problem as one of the limitations in her research. She states that "financial performance of the affected firms may be so bad that managers do not need to use accounting choices to manage earnings".

Our result shows that the mean value of abnormal accruals for the whole acquiring firms is relatively small, 0.71% of assets using the modified Jones model. However, we fail to present the indicative of income increasing accruals manipulation in the year prior to the acquisition announcement since these results are insignificant. Our results are consistent with many previous studies such as Erickson and Wang (1999), North and O'Connell (2002).

When it comes to the firm size, the large firm sample shows statistical significant average abnormal accruals of 1.7% of total assets. The positive value in large firms accounts for 78%. It seems that the large acquirers have great incentive of manipulating earnings upward before they announce their acquisition. The medium firm as well as the small firm samples presents insignificant average abnormal accruals of -2.2% and 0.02%, respectively.

In total, our study has 61% of positive discretionary abnormal accruals of which 72% is large firms. Most of negative ones are in mid and small firms (appendix). This once again confirms our findings that many large firms manipulate earnings upward prior to acquisitions.

	Mean	Median	Maximum	Minimum	%Positive
Total accruals	0.00716414	0.018272634	0.204612523	-0.232069158	61
Large Cap	0.01705923*	0.024083428	0.102170887	-0.205904544	78
Mid Cap	- 0.0226651	-0.02110983	0.083385566	-0.132084186	20
Small Cap	0.00022172	-0.002282176	0.204612523	-0.232069158	41

Table 4.5: Discretionary accruals from acquiring firms

There are some possible reasons why firms make the earnings management upward before an acquisition. If the earnings increase, this will send the positive signal to the market which leads to raise the stock price and create value for shareholders. If the managers use those shares as an exchange of payment, the price for the acquisition deal will be lower (Erickson and Wang, 1999; Louis, 2004). For example, in our case, prior to the acquisition of Lyocentre Nordic AB OYs business operations in 2006, Orion Corporation manipulates the earnings upward 10.2% of total assets. Bioporto AS also increases the reported earnings of 20.4% of total assets before taking over DiaCdem Technologies GmbH in 2006. Both of these acquirers use stock as the method of payment for their acquisitions. The large firms have many big acquisition deals. If they use stock swap for buying target and make the earnings management prior to that acquisition, the transaction price will significantly reduce, especially for the expensive deals.

On the other hands, some firms manipulate the earnings downward prior to the acquisitions. Nordiag manipulate earnings to be downward 23.2% of total assets, Nerosearch also stands at approximately 13%, Genmab manipulates 6.9%. One possible reason is that the managers of those firms want to depress the stock price in order to have cheap price for their insider purchases (Philips et al, 2009). This also might be motivated by the managerial theory. Another reason can be to avoid the risk of becoming target for an acquisition (Eddey and Taylor, 1999).

Not all of acquiring firms decide to make earnings management. According to Watt and Zimmerman (1990), if the cost of manipulating earnings exceeds the cost of undoing earnings management, the bidder and target firms may not to manage reported earnings. Moreover, poor performance problem as Jones (1991) said is also one of the reasons. In our sample, we consider the firms that have under 2% of discretionary accruals not make earnings management. There are 30% of those firms experiencing loss in the year of acquisitions.

However, in all of our extreme earnings management cases mentioned above, the acquiring firms receive negative abnormal returns in comparison with their equivalents in

the long term performance. For example, Bioporto which makes the highest positive discretionary accruals experienced -4.92% in its return while Nordiag which manipulates the earnings downward received negative return of -4.39%. This indicates that earnings management does have an impact on the long term performance on an individual basis. In fact, the managers manipulate the reported earnings to get a better deal in their acquisition or to satisfy their own interest but it can affect negatively to the firm earnings and in turns to the stock returns in the long term. Though, we can not detect the earnings management effect on the long term performance for the whole sample since the earning managements is statistically insignificant.

5. Conclusion and future research

5.1 Conclusion

In summary, the study of 22 biopharmaceutical firms within Scandinavian region does not detect any significant evidence that the acquisitions in general create value for the firms in the short term. In the 3-day event window, the average abnormal return shows positive value of 0.63% while in the 11-day event window, it shows -0.49%. Since these presented results are statistically insignificant, we can not conclude that acquisition activities generate value for acquiring firm's shareholders during the short run around the announcement date. However, one year after the acquisition, these firms gain the positive abnormal returns in comparison with their equivalents. It can be interpreted that these acquisitions make the firms perform better in the long term than other firms in the same industry and same size which do not make any acquisitions.

There is significant relationship between the firm's size and the value creation in the short term. These acquisitions significantly generate abnormal return of 2.02% for the large firms around three days of announcement date. In contrast, the small firms lose 5.78% of return after the acquisition. In the long term, with equally value weighted method, acquisition creates value for all of the firms in comparison with other firms in the same industry. The small firm has the highest average value of 0.57% (2.18%) while the large firms have the smallest value of 0.26% (0.18%). When it comes to value weighted method, it turns to negative value for the small cap at the overlapping sample and negative value for the large cap at the non-overlapping sample. We can conclude that the transaction value of acquisition might have minor effect on the long term performance of the firms. Otherwise, in general, acquisitions still generate higher values for those firms compared with others in the same industry.

We find no significant evidence of earnings management for the whole sample. However, we find significant value of managing earnings upward prior to acquisition for the large firms at 10% level of confidence. One might conclude that the acquisition create value for the firms in the short run because of earnings management, but in the long run, the firm can not receive positive abnormal return. However, our study proves that the large firms have higher return than non-acquiring firms in the same industry even they make earnings management which shows that the acquisition does make the firm perform better during the long term. However, when examining for the individual firm which manipulate reported earnings to a large extent prior to acquisition, we find that earnings management affects negatively on the stock price in the long term.

This study can be importance for the shareholders, managers and the investors. Shareholders and investors will pay attention to the market reaction to the firm's important decision such as M&A since these decisions might impact their value and bring wealth for them. Managers may observe the stock market's reaction to have the right decision in acquisitions. This study gives the acquiring firms some guidelines for future M&A activities.

5.2 Future research

Future research should combine both stock prices and accounting measurement as indicators for the firm performance. The long term horizon should be three to five years to fully absorb the benefit of acquisitions. There is a hypothesis that the top managers working together effectively will drive M&A success which is measured by accounting ratio of return on assets (Judge, Krishnan, and Miller, 1997).

M&A transactions in a competitive market should not be profitable for competitors. Firms make the acquisition in order to lower their costs or generate other competitive advantages such as economies of scale or scope. These acquisitions should create positive effect for the firm performance but lower the profit for competitors (King, Naseem, and Wilson, 2002). Therefore, future research should examine the effect of one firm's

acquisitions on the stock return of its main rivals. One event affecting one firm might also affect other firms.

In addition, our study shows that the longer the event window, the more significant result from the sample. Therefore, event window could be longer than the common 3-day event window and 11-day event window (i.e., -10, +10 or -30, +30). "Because of the complexity of M&As, it takes longer than a few days surrounding the announcement for market participants to correctly determine the extent of the economic implications for the acquiring firm" (Baltazar and Santos, 2003; Mueller and Sirower, 2003).

In our study, we only classify our sample according to the firm's size. Future research can detect the effect of acquisitions on short and long term by approaching different modes of acquisition activities such as cash payment versus stock payment, friendly versus hostile acquisition, domestic versus international acquisition. It may be the case that stockholders will react differently to M&A when it comes to different method of payment, different geographical markets and different types of acquisitions.

Furthermore, our paper only apply modified Jones model for earnings management and mean calendar time approach for long term performance. Although they are considered effective in discriminating abnormal accruals from normal accruals, abnormal return from normal return, respectively, some other models need to be undertaken for further study to receive a comprehensive result. The number of observations could be larger to have enough data for detecting effect of event, particularly in the case of classifying the sample into smaller group.

Regarding to earnings management, further research could examine the possibility of earnings management by both acquiring firms and target firms preceding the acquisitions announcement within biopharmaceutical industry since the target managers might also have different incentives to manipulate pre-acquisition reported earnings. One of the incentives to increase earnings is to push up the transaction price (Evangelos et al, 2005).

6. REFERENCES

6.1 Published Source

Agrawal, A., J. JafFe, and G Mandelker, (1992), 'The Post-Merger Performance of Acquiring Firms: A Re- Examinaticn of An Anomaly", Journal of Finance 47, 1605-1621.

Archbold, S., 2000. “A re-examination of management motives: in related and unrelated acquisitions”. Econ. Issues 5 (3), 63–86.

Asquith, P., Bruner, R.F., and Mullins, D. (1983), “The gains for bidding firms from merger”, Journal of Financial Economics, 11, 121-139.

Baltazar, R., and Santos, M. (2003), “The benefits of banking mega-mergers: Event study evidence from the 1998 failed mega-merger attempts in Canada”, Canadian Journal of Administrative Sciences, 20, 196–208.

Barber. M.B. and J.D. Lyon. (1997), "Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics," Journal of Financial Economics 43, 341 -372.

Bergstresser, D., Philippon, T., 2006. CEO incentives and earnings management. Journal of Financial Economics 80, 511–529.

Boonpramote, T., 2004. “Mergers and acquisitions in the metal mining industries: cases of aluminum, copper and diversified mining companies”. Doctoral Thesis, Colorado School of Mines. T-5838.

Brav. A., (2000). "Inference In Long-Horizon Event Studies: A Parametric Bootstrap Approach with Application to Initial Public Offering”, Journal of Finance 55, 1979-2016.

Brown, S.J., and Warner, J.B. (1980), “Measuring security price performance”, Journal of Financial Economics, 8: 205-258.

Brown, S.J., and Warner, J.B. (1985), “Using daily stock returns: The case of event studies”, Journal of Financial Economics, 14: 3-31.

DeAngelo, L. (1986), “Accounting numbers as market valuation substitutes: a study of management buyouts of public shareholders”, The Accounting Review, Vol. 61, pp. 400-420.

Dechow, P.M., Sloan, R.G. and Sweeney, A.P. (1995), “Detecting earnings management”, The Accounting Review, Vol. 70, pp. 193-225.

Cording, M., Christmann, P. and Bourgeois, L.J. (2000), “A focus on resources in M&A success: A literature review and research agenda to resolve two paradoxes”, URL: www.darden.virginia.edu/batten/pdf/WP0017.pdf (May 15, 2006).

Cybo-Ottone, A. and Murgia, M. (2000). “Mergers and shareholder wealth in European banking”, Journal of Banking and Finance, 24: 831-860.

Easterwood, C.M. (1998), “Takeovers and incentives for earnings management: an empirical analysis”, Journal of Applied Business Research, Vol.14, pp.29-47.

Erickson, M. and Wang, S. (1999), “Earnings management by acquiring firms in stock-for-stock mergers”, Journal of Accounting and Economics, Vol.27, pp.149-176.

Eckbo, B.E., M. Giammarino and R Heinkel, 1990, "Asymmetric information and the Medium of Exchange in Takeovers," Review of Financial Studies 3,651-675.

Eddey, P.H. and Taylor, S.L. (1999), “Directors’ recommendations on takeover bids and the management of earnings: evidence from Australian takeovers”, Abacus, Vol. 35, pp. 29-45.

Evangelos, K., Costas, S., Antonios, G. (2005), “Firm acquisitions and earnings management: Evidence from Greece”, Managerial Auditing Journal, Vol.20 No.7, pp.663-678.

Fama, E.F.. 1970, "Efficient capital markets: A review of theory and empirical work", Journal of Finance, Vol. 25:2, pp. 383-417.

Fama, E.F.. 1998, "Market Efficiency, Long-Term Returns, and Behavioral Finance," Journal of Financial Economics 49, 283-306.

Fama, E.F and K.R. French, 1993. "Common Risk Factors in The Returns on Stocks and Bonds" Journal of Financial Economics 33, 3-56.

Fama, E.F. and K.R. French, 1998, "Value versus Growth: The International Evidence," Journal of Finance 53, 1975-1999.

Franks, J., R.S. Harris, and S. Titman. 1991, "The Postmerger Share-Price Performance of Acquiring Firms", Journal of Financial Economics 29, 81 -96.

Guay, W.A., Kothari, S.P. and Watts, R.L. (1996), “A market-based evaluation of discretionary-accrual models”, Journal of Accounting Research, Vol. 34, pp. 83-105.

Groff, J.E. and Wright, C.J. (1989), “The market for corporate control and its implications for accounting policy choice”, Advances in Accounting, Vol. 7, pp. 3-21.

Healy, P. (1985), “The effect of bonus schemes on accounting decisions”, Journal of Accounting and Economics, Vol. 7, pp. 85-107.

Higgins, M.J., Rodriguez, D. (2006), “The outsourcing of R&D through acquisition in the pharmaceutical industry, Journal of Financial Economics 80: 351-383.

Hribar, P., Collins, D., 2002. “Errors in estimating accruals: implications for empirical research”, Journal of Accounting Research 40, 105–134.

Jones, J. (1991), “Earnings management during import relief investigations”, The Accounting Review, Vol. 29, pp. 193-228.

Joppe, M. (2000), “The research process”. URL: http://www.ryerson.ca/~mjoppe/rp.htm.

King, J.L., Wilson, N.L.W., and Naseem, A (2002), “A tale of two mergers: What we can learn from agricultural biotechnology event studies”, AgBioForum, 5, 14–19.

Krishnan, H.A., Miller, A., and Judge,W.Q. (1997), “Diversification and top management team complementarity: Is performance improved by merging similar or dissimilar teams?”, Strategic Management Journal, 18, 361-374.

Kothari. S.P. and J.B. Wamer, 1997, "Measuring Long-Horizon Security Price Performance", Journal of Financial Economics 43,301-339.

Kusnadi, J. and Sohrabian, A. (1999), “The impact of insurance mergers on shareholder returns”. URL: http://www.csupomona.edu (May 28, 2006).

Loderer. C. and K. Martin, 1992, "Post-Acquisition Performance of Acquiring Firms", Financial Management 21, 69-79.

Louis, H. (2004), “Earnings management and the market performance of acquiring firms”, Journal of Financial Economics, Vol. 74, pp. 121-148.

MacKinlay, A.C. (1997). “Event studies in Economics and Finance”, Journal of Economic Literature 35 (1): 13-39.

Marcia, M.C., Alan, J.M and Hassan.T (2008). “Corporate governance and pay-for-performance: The impact of earnings management”, Journal of Financial Economics 87, 357-373.

McWilliams, A. and Siegel, D. (1997), “Event studies in management research: theoretical and empirical issues”, Academy of Management Journal, Vol.40, No.3, 626-657.

Mei, B. and C. Sun (2008). "Event Analysis of the Impact of Mergers and Acquisitions on the Financial Performance of the U.S. Forest Products Industry", Forest Policy and Economics 10: 286–294.

Miller, D., (1999). “The market reaction to international cross-listings: Evidence from depository receipts”, Journal of Financial Economics, Vol.51, pp.103-123.

Mitchell. M.L. and E. Stafford, 2000, "Managerial Decisions and Long-Term Stock Price Performance," Journal of Business 73, 287-320.

Mueller, D.C., and Sirower, M.L. (2003), “The causes of mergers: Tests based on the gains to acquiring firm’s shareholders and the size of premia”, Managerial and Decision Economics, 24, 373–391.

North, D.S. and O’Connel, B.T. (2002), “Earnings management and mode of payment in takeovers”, working paper, University of Richmond, Richmond, VA.

Oliver.E. and Ludwig.T (2007), “Large mergers and acquisitions of European Brewing Groups – Event Study Evidence on Value Creation”, Agribusiness, Vol. 23(3), 377-406.

Patricia, M., Andrew, E. and Sean, N. (2007), “Mergers and acquisitions in the pharmaceutical and biotech industries”, Manage. Ecis. Econ. 28: 307-328.

Phillips, J., Badertscher, B., Pincus, M., Rego,S.O. (2009), “Evidence on motivation for downward earnings management”, URL: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=921422

Rau, P.R. and T. Vemiaclen, 1998. "Glamour Value and the Post-Acquisition Perfonnancc of Acquiring Firms", Journal of Financial Economics 49, 223-253,

Ravenscraft, D.J., Long, W.F. (2000), “Paths to creating value in pharmaceutical merger”. In mergers and productivity, Kaplan SN (Ed.). NBER Conference Report Series. University of Chicago Press: Chicago.

Robert, G.B and Farshid, N (2003), “Earnings management and abnormal returns: Evidence from the 1970-1972 price control regulation”, Journal of Accounting and Finance 43, 1-19.

Roll, R. (1986), “The hubris hypothesis of corporate takeovers”, Journal of Business, Vol. 59, pp. 197-216.

Roller, L., Stennek, J., Verboven, F., 2000, “Efficiency gains from mergers”, Working Paper No. 543. Stockholm: The Research Institute of Industrial Economics (IUI).

Ryngaert, M., and Netter, J. (1990), “Shareholder wealth effects of the 1986 Ohio antitakeover law revisited: Its real effects”, Journal of Law, Economics and Organization 6: 253-262.

Thomas, J. and Zhang, X-J. (2000), “Identifying unexpected accruals: a comparison of current approaches”, Journal of Accounting and Public Policy, Vol. 19, pp. 347-76.

Watts, R.L. and Zimmerman, J.L. (1990), “Positive accounting theory: a ten-year perspective”, The Accounting Review, Vol. 65, pp. 131-156.

Wells, W. (2004), “A beginner’s guide to event studies”, Journal of Insurance Regulation, 22: 61-70.

Wilke, Sanden, Malmqvist and Jansson (2006), Spara smartare, p.50

6.2 Electronic Sources

http://www.astrazeneca.se 2010-04-15

http://www.astrazeneca.com/media/latest-press-releases/2001/377?itemId=3892685 2010-05-17

http://www.biospace.com/news_story.aspx?NewsEntityId=105546 2010-05-21

http://www.deltamarketingdynamics.com 2010-04-17

http://finance.mapsofworld.com/merger-acquisition/impact.html 2010-04-10

http://www.nytimes.com/2007/04/24/business/24drug.html 2010-05-17

httphttp://www.thepharmaletter.com/ 2010-05-21

http://www.tradingmarkets.com/news/press-release/ave_gsk_pfe_wye_ten-year-data-on-pharmaceutical-mergers-and-acquisitions-from-dealsearchonline-com-reveals-top-dea-872944.html 2010-04-10

6.3 Annual Reports

AstraZeneca Annual report of 2000-2001, 2004-2007.

ALK Abello AS Annual report of 1999-2000, 2005-2006.

Bavarian Nordic Institute Annual report of 2002-2003.

Biolin AB Annual reports of 2005-2007.

BioPhausia AB Annual reports of 2006-2007.

BioPorto A/S Annual reports of 2005-2006.

Biotie Therapeis Oyj Annual reports of 2007-2008.

Diamyd Medical AB Annual reports of 2004-2005.

Genmab Annual reports of 2007-2008.

H Lundbeck A/S Annual reports of 1999-2003.

Karo Bio AB Annual reports of 1999-2000.

Meda AB Annual reports of 2003-2008.

Medi-Cult AS (origio) Annual reports of 2007-2008.

Medivir AB Annual reports of 1999-2000.

Navamedic ASA Annual reports of 2006-2007.

Neurosearch AS Annual reports of 2000-2001, 2005-2006.

NorDiag ASA Annual reports of 2006-2007.

Novo Nordisk A/S Annual reports of 1998-2003, 2006-2007.

Orexo AB Annual reports of 2006-2007.

Orion Corporation Annual reports of 2001-2002, 2005-2006.

Topo Target A/S Annual reports of 2006-2007

VitroLife AB Annual reports of 2005-2008.

6.4 Databases

Datastream distributed by Thomson Reuters Financial.
Available at Lund University (LINC)

Elin@Lund distributed by Lund University Libraries [Online]
Available from:
http://elin.lub.lu.se/elin?lang=se

Reuters 3000Xtra distributed by Thomson Reuters Financial.
Available at Lund University (LINC)

Social Science Research Network (SSRN)-Tomorrow's Research Today distributed by Social Science Electronic Publishing [Online].
Available from:
http://www.ssrn.com

Social Sciences Ciatation Index (SSCI)-Web of Science distributed by Thomson Reuters [Online].
Available from:
http://www.isiknowledge.com

Appendix

No	Completion date	Acquirer	Target	Total asset t-1	+-Sales	+-Receiveables	PPE t	Total accruals t	DAC
1	5/1/1999	Novo Nordisk	Profound Pharmaceuticals	30,932.14	3,058.00	-133.99	12,733.55	388.92	0.024083428
2	5/10/2000	Medivir AB	Mimetrix Ltd	260.00	-84.60	4.72	38.40	7.30	0.016418924
3	6/26/2000	Karo Bio AB	Novalon Pharmaceutical Corp	245.50	12.60	5.20	24.70	10.80	0.049995212
4	11/1/2000	ALK-Abello A/S	Center Laboratories From Heska Corporation	6,261.67	495.54	-274.42	428.63	-234.73	-0.030297585
5	11/4/2000	H Lundbeck A/S	Vis Farmaceutici Istituto Scientifico Delle Venezie Spa	5,260.39	1,850.61	-469.46	2,067.19	268.75	0.078906408
6	12/4/2000	H Lundbeck A/S	CF Pharma Gyogyszergyarto Kft	5,260.39	1,850.61	-469.46	2,067.19	268.75	0.078906408
7	1/10/2001	AstraZeneca PLC	Astra-IDL	190,505.44	-16,772.83	-3,431.04	55,899.09	3,255.35	0.018272634
8	2/2/2001	AstraZeneca PLC	Astra IDL	190,505.44	-16,772.83	-3,431.04	55,899.09	3,255.35	0.018272634
9	2/23/2001	H Lundbeck A/S	Lundbeck GmbH & Co	8,424.69	2,525.05	170.16	3,200.71	249.65	0.049312624
10	3/21/2001	Neurosearch AS	Display Systems Biotech A/S	578.41	-44.71	9.07	207.42	-77.75	-0.132084186
11	8/15/2001	Novo Nordisk AS	TransTech Pharma Inc	30,545.24	6,047.44	1,378.65	19,210.48	1,582.35	0.069141444
12	9/5/2001	AstraZeneca PLC	Bio-Therabel SA	190,505.44	-16,772.83	-3,431.04	55,899.09	3,255.35	0.018272634
13	12/13/2001	Novo Nordisk A/S	Biobras SA	30,545.24	6,047.44	1,378.65	21,913.14	1,582.35	0.070528021
14	7/1/2002	Orion Corporation	Kronans Droghandel AB	6,817.22	-187.84	60.48	2,446.50	187.84	0.031506657
15	2/26/2003	Novo Nordisk A/S	Biobras SA	37,036.96	1,806.32	3,650.74	20,080.89	1,507.73	0.046794789
16	3/6/2003	H Lundbeck A/S	Synaptic Pharmaceutical Corp	11,389.65	556.64	18.68	4,448.22	188.00	0.024995457
17	4/29/2003	Novo Nordisk IT AS	e-sense	37,036.96	1,806.32	3,650.74	20,080.89	1,507.73	0.046794789
18	5/13/2003	Bavarian Nordic	GTB GenTherapeutika Berlin-Buch GmbH	390.39	495.69	-1.35	12.75	7.37	0.083385566
19	3/29/2004	Meda AB	Ipex Medical AB	773.00	64.10	17.90	0.80	-56.50	-0.069220425
20	9/29/2005	Meda AB	Viatris GmbH & Co KG	1,122.00	552.10	131.30	1.00	-252.30	-0.205904544
21	12/19/2005	Diamyd Medical AB	Nurel Therapeutics Inc	157.70	-0.85	0.36	0.22	-0.30	0.002346584
22	1/26/2006	AstraZeneca PLC	Kudos Pharmaceuticals Ltd	220,857.15	18,631.04	5,777.47	54,992.93	6,271.84	0.035142947
23	1/31/2006	VitroLife AB	Swemed Lab International AB	211.30	51.00	10.80	81.70	-8.70	-0.022396531
24	2/15/2006	ALK-Abello A/S	ALK-SCHERAX Arzneimittel GmbH	7,965.61	319.02	135.30	770.87	-189.92	-0.02110983
25	2/23/2006	Orion Corporation	Lyocentre Nordic AB OYs business operations	5,602.20	513.84	-38.88	1,732.23	517.54	0.102170887
26	3/6/2006	BioPorto A/S	DiaCdem Technologies GmbH	17.95	1.48	-0.23	0.61	2.86	0.204612523
27	8/22/2006	AstraZeneca Ltd	Cambridge Antibody Tech Group PLC	183,285.17	18,631.04	5,777.47	54,992.93	6,271.84	0.042346968
28	10/23/2006	Neurosearch A/S	Carlsson Research AB	926.53	-141.88	45.00	47.11	-4.59	-0.013219714
29	10/23/2006	Biolin AB	Integration Diagnostics Ltd	87.86	10.60	4.65	41.14	5.27	0.078856672
30	11/9/2006	Meda AB	3M's European Pharmaceutical Division	11,499.50	2,386.10	106.60	625.50	-205.00	-0.007238521
31	1/31/2007	Novo Nordisk A/S	PHARMAPLAN GMBH	55,514.17	3,835.76	1,153.96	24,352.35	1,222.28	0.031262125
32	3/2/2007	Biolin AB	KSV Instruments Ltd.	159.41	79.63	13.74	122.54	-1.81	0.025413736
33	3/19/2007	AstraZeneca PLC	Arrow Therapeutics Ltd	202,337.63	20,847.56	7,483.22	56,093.73	3,197.44	0.023373546

34	4/2/2007	NorDiag ASA	Genpoint AS	64.68	8.89	1.61	7.17	-16.20	-0.232069158
35	6/18/2007	Topo Target A/S	Apoxis SA	591.49	-1.04	16.26	22.87	-6.21	-0.010094876
36	6/27/2007	AstraZeneca PLC	Medimmune Inc	202,337.63	20,847.56	7,483.22	56,093.73	3,197.44	0.023373546
37	8/22/2007	Meda AB	MedPointe Inc	11,318.90	2,889.00	647.50	787.00	-76.00	0.004102625
38	10/5/2007	Navamedic ASA	Vitaflo Scandinavia AB	60.54	23.11	2.97	106.41	-11.32	-0.131261958
39	11/16/2007	Orexo AB	Biolipox AB	379.93	-55.20	25.02	57.79	35.00	0.086112854
40	11/23/2007	Meda AB	Recip AB	11,318.90	2,889.00	647.50	787.00	-76.00	0.004102625
41	12/13/2007	BioPhausia AB	All-Gen Pharmaceuticals & Generics B.V.	500.66	142.46	-21.87	1.98	-29.10	-0.040600928
42	1/31/2008	Vitrolife AB	ATS Srl	299.00	36.20	10.68	94.80	-15.58	-0.040542183
43	3/7/2008	Genmab	Antibody Manufacturing Facility of PDL BioPharma	5,111.44	279.09	-71.90	1,262.49	-392.72	-0.069468315
44	3/13/2008	Meda AB	Ellem Lakemedel AB	28,649.00	2,530.00	524.00	935.00	-532.00	-0.014616049
45	4/1/2008	Medi-Cult AS	Stefan Gueck Zellkulturbedarf GmbH	518.47	79.77	18.42	99.18	-6.46	-0.002282176
46	7/4/2008	Vitrolife AB	ATS Srl	299.00	36.20	10.68	94.80	-15.58	-0.040542183
47	9/11/2008	Meda AB	Valeant Pharmaceuticals	28,649.00	2,530.00	524.00	935.00	-532.00	-0.014616049
48	11/7/2008	Medi-Cult A/S	MidAtlantic Diagnostics Inc	518.47	79.77	18.42	99.18	-6.46	-0.002282176
49	11/14/2008	Biotie Therapies Oyj	elbion GmbH	289.48	-26.67	7.31	26.86	18.48	0.062084972

Source: Annual report and author's calculation