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The effects of tender offers on target firms' market value: case Sweden

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Key words:	Tender Offers, Cumulative Average Abnormal Returns (CAAR), Cumulative Abnormal Return (CAR), Event Study, Regression Analysis, Market Value and Target Firms.
Purpose:	Investigate to what extent tender offers have created value for shareholders of target firms on the Swedish stock market and if there are any relationship between specific variables and the targets' abnormal returns.
Methodology:	The event study methodology and cross sectional regression analysis.
Theoretical perspectives:	The efficient market hypothesis is the starting point in our thesis followed by theory concerning determinants of abnormal returns for target firms.
Empirical foundation:	Tender offers during 1999-2010 on Swedish public companies.
Conclusions:	We find that target shareholders gain approximately 15 percent abnormal returns around the days of the announcement. Further, we find that the two of the variables, Tobin's Q and stock price run-up, significantly affect the target announcement return.

1. Introduction

1.1 Background

"Global merger and acquisitions activity in 2010 is off to its worst start in six years…" (Howley, 25/6 2010). Since 2007, M&A's peak year, the economic crisis has depressed the M&A activity around the world. Additionally, fears over sovereign debt and a pro-longed recession in Europe have made M&A activity in the region the lowest in a decade (Howley, 2010).

However, European private equity activity has rebound, investment increased by 18 percent compared to the last six months. The Nordic region was especially strong with a 23 percent increase during this period (Ward, 2010), which might imply that there is some positive momentum in the market. The low M&A activity complicates things for fund managers and investors who invest in companies involved in a merger or an acquisition. Merger arbitrage hedge fund managers face difficulties finding enough deals to keep their portfolios diversified (Yang and Branch, 2001).

As deal activity will increase, more and more bids will be made on possible targets. Thus, it is relevant to conduct further research on the behaviour of the target stock around the announcement of a takeover and what might influence the movement of the stock. After the announcement of a merger or acquisition the target's stock price generally adjusts upward. This is usually because the bid for the firm is above the stock's market value.

Value-creation to targets owner is a well documented phenomenon, however the gains for the target shareholders' varies considerable. Further, there are some possible target or deal characteristics that could explain the abnormalities in target returns around a bid announcement (Croci, Petmezas and Travlos, 2009). As an example, Huang and Walkling (1987) propose that the type of acquisition, the method of payment and managerial resistance significantly shape the target returns.

Considering that a new merger wave might start after the recent financial crisis, we find it interesting to investigate target stock around a tender offer.

1.2 Problem discussion

Merger and acquisitions is a subject often debated and also a topic subject to extensive research within the field of finance. A common setting in the field of research has been to investigate whether or not a deal is value creating. The hypothesis tested is if the shareholders of the target earn abnormal returns from mergers and acquisitions. For a review of the research see for example Jensen and Ruback (1983), Datta, Pinches and Narayanan (1992), Bruner (2002) and Campa and Hernando (2004). All conclude that target shareholders earn abnormal returns, when proposed a bid. Even though these studies vary regarding time period, type of deal and observation period, they all show that target shareholders on average earn abnormal returns. These surveys have shown that target shareholders gain an average abnormal return in the 20-30 percent range. Further, most of the studies find that abnormal returns occur in the days following the announcement. However, a recent study by Wong and Cheung (2009) over the period 2000-2007 on target firms in Asia finds no abnormal return to target firms around the announcement period.

As our thesis will focus on tender offers we present the results of three different articles, below, that only investigates tender offers which is in contrary to the articles above who investigates all types of mergers and acquisitions. Jarrell and Poulsen (1989a) and Lang, Stulz and Walkling (1989), including only successful tender offers, found that target companys' shareholders earn significant cumulative abnormal returns in the 20-40 percent region using different event windows. Further, Smith and Kim (1994) find the same results using a sample of both successful and unsuccessful tender offers.

Further, research within this field has also focused on what could explain the different return patterns. The variables included in the different studies could be sorted into the following four categories in accordance with Haleblian, Devers, McNamara, Carpenter and Davson (2009); deal characteristics, managerial effects, firm characteristics and environmental factors.

An example of deal characteristics is the method of payment, and how it affects target companies' returns in conjunction with a takeover. Draper and Paudyal (1999) study implies that target companies approached with the option of cash or shares, earn highest excess return followed closed by pure cash bids. The lowest excess return occurs if the method of payment

by the bidding firm is shares. Huang and Walkling (1987) finds that cash offers give significantly and substantially higher returns to target shareholders. However, Suk and Sung (1997) finds that there is no difference in target abnormal returns between a cash offers and a share offers.

Another deal characteristic is the deal type; it has been shown and argued by Jensen and Ruback (1983) that tender offers outperform mergers. Datta et al. (1992) also draws the same conclusion that tender offer is to prefer over mergers, whenever possible. Further, the researchers find that target company managers can maximize gains for their owners by avoiding being acquired by a bidding company in a different industry. The variable that has been tested is if the deal is conglomerate or non-conglomerate.

In the category managerial effects, there has been research testing the relationship between ownership structure and target returns. Bauguess, Moeller, Schlingemann and Zutter (2009) find that managerial ownership has a positive and significant relationship with target returns and outside ownership has a negative and significant relationship with target returns. Further, Song and Walkling (1993) and Stulz, Walkling and Song (1990) find that target returns are increasing in managerial ownership and decreasing in institutional ownership for a sample of multiple bidder tender offer contests. Both Stulz et al. (1990) and Bauguess et al. (2009) find that target returns seem to be best explained by the takeover anticipation hypothesis. A further subject that has been explored is for example the relationship between target returns and managerial experience and compensation.

Investigating firm characteristics, Croci et al. (2009) find that high idiosyncratic volatility targets receive substantially higher announcement returns compared to targets with low idiosyncratic volatility. Other variables that have been researched upon are for example the relationship between historical performance and firm size with target announcement returns. Bauguess et al. (2009) find that target book-to-market and targets market adjusted stock performance has a significantly positive respectively negative relationship with target returns. Schwert (2000) finds that there is a negative relationship target firm size and bid premiums.

Environmental factors include variables such as different merger waves, time period and regulations. Croci et al. (2009) controls for the dot com effect and find that target announcement returns are higher for bids announced during the period 1998-2000 than other

bids. The above presented factors have all been investigated in order to explain target returns around an announcement of a bid. This is a short overview and there are of course more variables that have been tested in conjunction with target returns.

To our knowledge, there are no research papers published investigating these issues on the Swedish market. Even though the first issue mentioned above has been thoroughly examined, we find it interesting to see if we can draw the same conclusion on the Swedish market. Further, the research on different variables is not so comprehensive and some studies show different results. Thus, it will be important to see what a study on the Swedish market will reveal.

1.3 Purpose

The purpose of our thesis is two tied. First we investigate to what extent tender offers have created value for shareholders of target firms on the Swedish stock market. Secondly, we investigate if there are any relationship between specific variables and the targets' abnormal returns.

1.4 Thesis outline

This thesis includes seven chapters starting with chapter 2, the theoretical background for our thesis. Chapter 3 describes our hypotheses following from chapter 2. Chapter 4 outlines the method used and the methodological problems we have encountered. In chapter 5 we display our empirical findings. Chapter 6 includes analysis of our findings. In the last chapter, chapter 7, we conclude our findings and present some subjects that could be of interest for future research.

2. Theoretical background

In this chapter we describe a tender offer and review previous research for studies examining returns around the announcement of a tender offer as well as studies of determinants for the target announcement returns.

2.1 A description of Tender Offers

A tender offer is a way to acquire a target company's shares and is usually implemented when negotiations' being held with the target company's management has failed. Since a tender offers provides the possibility of gaining control over a company even though the management opposes the offer. If so, the offer is considered as a hostile offer. The possibility of a company becoming a target in a hostile takeover can be seen as something positive for the shareholders. Since this possibility is something that target management is reluctant to and thereby they try to avoid it by maximizing the wealth of their shareholders, hence, agency costs are minimized (Gaughan, 2007, pp. 240-248)

Tender offers usually endure higher costs for the acquirer due to publication costs and legal costs. Further, once a tender offer is presented the target company might attract the attention of other companies that are also looking for a target company, which can lead to an auction, and thereby make the premium paid higher than initially expected and the company that originally initiated the deal might not end up as the acquirer (Gaughan, 2007, pp. 240-248).

Apart from the target and acquiring company there are several other players that have a role in the process of a tender offer. These players include an investment bank that helps the bidder with financing and other advisory services in the process, legal advisors, information agent, depository bank and a forwarding agent (Gaughan, 2007, pp. 240-248).

Sometimes the bidding firm uses a two-tiered offer in order to achieve a faster acceptance from target shareholder. This type of offer is usually front-end loaded which means that there is greater payoff to target shareholders that tenders in the first step and a lower payoff if they choose to tender during the second step of the offer. The rationale behind this type of offer is

that if a large enough number of shares is tendered in the first step then the remaining shareholder will be excluded and instead they will receive a compensation that is considered to be inferior, such as debentures instead of cash (Gaughan, 2007, pp. 247-248).

Although there's a framework for countries in the European Union most countries still have their own national rules. The framework controlling tender offers in Sweden is extensive and the main issues will be summarized below. An acquiring company is only allowed to initiate an offer if they have the ability and purpose of closing the deal; this is so because the announcement of an offer will most likely affect the share prices of the parties involved. During the due-diligence process the bidding company is not allowed to trade in target stocks since they might obtain private information during this process (NASDAQ OMX Stockholm, 2009).

Once the bidding company has decided to place a bid on a target company they should communicate this through a public announcement, also, if the bidding company has reason to believe that there has been some kind of information leakage they should also communicate this to the public so that everyone has the same information. The bid being communicated must be equal to shareholders holding the same type of shares and the bid should also be pre-determined. Often, the offer is contingent on the tender of a fix minimum number of shares. Target shareholders have no more than 12 weeks to decide if they want to tender the offer or not. Shareholder with the same type of shares must be given the same offer and once they have decided to tender they can't withdraw their tendering. Target company board of directors should give their opinion about the offer no later than two weeks before the accept period ends (NASDAQ OMX Stockholm, 2009).

2.2 The realization of shareholder value – market efficiency

Target performance has in previous research studies typically been measured using an event study methodology. Based on theoretical arguments a pre-specified event-window is developed. Both short-and long run event windows are used frequently see for example Bruner (2002) and Campa and Hernando (2004). When trying to conclude when all of the effects of a deal have been fully incorporated in the share price the level of market of

efficiency that one assumes is important. We will therefore review the efficient market hypothesis and the empirical evidence of it.

The efficient market hypothesis states that it is not possible to obtain abnormal returns for an investor, since the stock price fully reflects all available information (Fama, 1965). In a later article (Fama, 1970) introduces a new definition of market efficiency. The author defines a market as being efficient if stock prices reflect all available information. Further, he presents three levels of market efficiency; strong, semi-strong and weak.

Under the weak form, today's security prices reflect all information contained in historical prices. Under the semi-strong form of market efficiency, security prices immediately adapts to new publicly available information. Thus, stock prices will adjust for an announced tender offer. Under the strong form, all information (both private and public) is reflected in the stock price. Thus, insiders cannot expect to earn an abnormal return. Further, a tender offer announcement should not affect the stock prices, since the tender offer is already expected and incorporated in the stock price.

Previous studies on abnormal returns for example see Bruner (2002) assumes semi-strong market efficiency and thereby assuming that stock prices react accordingly and unbiased when new information arrives.

2.3 Review of target performance

As mentioned earlier there has been a wide range of event studies investigating the relationship between target company returns around the announcement of a merger or acquisition. When looking at previous studies there is strong consensus among researchers that target firms earn statistically significant abnormal returns around the announcement of an M&A transaction. This consensus is strong across markets, markets being covered in the articles are North America, Europe and Asia, across different event windows, including both short and long run event windows, and across different time periods. For a review of this evidence see for example Bruner (2002), Campa and Hernando (2004) and Haleblian et al. (2009). However one article that have not been able to observe positive abnormal returns to

target shareholder is the article by Wong and Cheung (2009), covering the period 2000-2007 looking at target firms in Asia, who finds no abnormal return to target firms around the announcement period.

Although, there is consensus concerning the significance in the returns for target companies the level of return varies substantially ranging from roughly 10-50 percent with an average of ranging from 20-30 percent.

2.4 Determinants of Target Firm Returns

2.4.1 Method of Payment

The method of payment in a deal is only limited to the imagination of the parties being involved in the transaction. The most commonly used methods are, stock, cash or a mixed cash and stock offer. Stock deals involve the decision of determining the price of the stock on which the valuation is based on, either one chooses a fixed exchange rate or a floating exchange rate. When applying a floating exchange rate one normally uses an average price during a pre-determined time period (Gaughan, 2007, pp. 117-136). If one assumes symmetric information, no taxes and no transaction cost the method of payment shouldn't matter.
However, this is not the environment in which companies compete and therefore these things do in fact matter, (Kargin, 2001).

Previous studies have shown that the method of payment matter when determining reasons for abnormal returns to target shareholders. Many of these studies have found that the returns are higher when the target company are faced with a cash bid than with a stock bid, see for example Wansley, Lane and Yang (1983), Huang and Walkling (1987) and Asquith, Bruner and Mullins (1990). These studies explains this difference by using the tax hypothesis, which assumes that shareholders who are faced with a cash bid will have to pay tax on the capital gain directly while in a stock offer they won't have to pay taxes until they sell their share. Hence, this immediate payment of taxes has to be compensated for in a cash offer. Further, Berkovitch and Narayanan (1990) argues that the higher returns in cash offers are due to the fact that this payment conveys positive information about the synergies that can be obtained,

information effect hypothesis. However, both these hypothesis yields the same conclusion, cash offers should yield a higher return to target shareholders. In contrast to these articles Suk and Sung (1997) finds no difference in target abnormal returns depending on the method of payment. Finally, Draper and Paudyal (1999) find that target firms realize the greatest returns when the shareholders are given the option to choose between stock and cash.

To summarize previous research there is some consensus that cash bids yield higher return to target shareholders.

2.4.2 Tobin`s Q

When deciding if a target company should be classified as a value creating company with good growth opportunities an often used measurement is Tobins Q see for example Dong, Hirshleifer and Richardson (2006), Lang et al. (1989) and Servaes (1991). Tobins Q is defined as the ratio between the market value of a firm's equity in relation to the replacement cost (Lindenberg and Ross, 1981). Dong, Hirshleifer, Richardson and Teoh (2006) argues that Price/Book Value is a good proxy for Tobin's Q, because of the fact that the book value is a reflection of the historical costs whereas the price or market value of equity is a forward looking measurement. Further, in support of the Price/Book ratio they argue that the predicting power of Book/Price ratios has been strong when analyzing the cross section of subsequent one month returns. Also Price/Book ratio has been proven to be a good approximation of mispricing when one puts it in the content of theoretical models based on psychology. Their study consists of approximately 3700 M&A deals in the U.S during the years 1978-2000. The authors found that the abnormal returns for target shareholder are highest when the target has a low Price/Book ratio, Tobin's Q. This finding is consistent with the information hypothesis that companies that are undervalued, mispriced, will see a correction due to the takeover bid.

However, if one adopts the framework behind Tobin's Q, that takeover gains are due to assets being reallocated, one can state that the abnormal returns to target firms with low Price/Book ratio is due to the fact that there is a larger room for improvement and value creation in these companies. This greater improvement is something that can be shared between the shareholder of target firm and the acquiring firm. Servaes (1991) uses a sample of 704 M&A

deals 1972-1987 on the US market and measures abnormal returns to the parties in a transaction and he finds that target firm abnormal returns are greatest when the firm has a low Tobin's Q, 32.7 percent, and is 13 percent less if the target company has a high Tobin's Q, this is also consistent with the findings of Lang et al. (1989) who uses a sample of 209 successful tender offer in the US between 1968-1986 and finds that target companies with a high Tobin's Q on average earn 14 percent less than low Q targets.

The few previous studies that investigate the effects of Tobin's Q points in the same direction, target companies with a low Tobin's Q earn higher returns than companies with high Tobin's Q.

2.4.3 Synergy Hypothesis vs. Information Hypothesis – Successful vs. Unsuccessful Tender Offers

When two companies, being combined, are able to create more wealth than the companies would together on a standalone basis they have been able to create synergies. Usually one discusses two kinds of synergies, operational and financial. Operational synergies involve improved operational performance either through cutting costs or increasing revenues. Financial synergies on the other hand involve the step of improved financial situation of the company through lowering the cost of capital. The synergy hypothesis requires that the two entities are combined, implying a successful offer. The information hypothesis on the other hand states that the "right" share price of a target company is being re-evaluated during the bid process (Halpern, 1982).

There are two sides of the information hypothesis. First, one way of looking at it, is that spreading of new information enables the market to price previously undervalued shares fairly. Secondly, one could look at it as if the new information enables the management of the target firm to pursue a more or higher valued strategy of their operations. The conclusion of the information hypothesis is that there is no need for the offer to be successful (Bradley, Desai and Kim, 1983). Schwert (1996) finds that successful target experience a slightly higher returns than unsuccessful targets, however this difference is not statistically significant. For a review of studies yielding similar results see Jensen and Ruback (1983).

In line with, Bradley, Desai and Kim (1988) we don't use an arbitrary cut-off point, instead we define a successful tender offer as an offer where any number of target shares are being bought by the bidding firm. Because even a small purchase of shares can alter the voting power and thereby affect the operations of the firm.

2.4.4 Idiosyncratic volatility

Croci et al. (2009) investigate the relationship between idiosyncratic volatility (sigma) and target announcements returns. The authors argue that target companies with greater pre-event idiosyncratic volatility receive considerably larger announcements returns relative to low idiosyncratic volatility companies. Targets with high sigma should have greater uncertainty and thus be more difficult to value. Croci et al. (2009) argues that an investment in a high risk project is expected to lead to larger returns for the bidding company, disregarding behavioural and agency motivations behind the deal, and subsequently a higher bid. This higher bid will subsequently give higher announcements returns for target shareholders'. The authors find that high sigma targets significantly outperform low sigma counterparts by a 9.34 percent return margin. Also, by further dividing the sample by method of payment, the authors find that high sigma targets significantly outperform low sigma targets for all forms of financing. However, given the information asymmetry theory we would expect that high sigma targets would earn less than low sigma targets when stock is used as a method of payment.

As mentioned by Croci et al. (2009) their study is the first that investigates the relationship between idiosyncratic volatility and target returns, hence, the theoretical and previous research being available to us is limited.

2.4.5 Stock Price Run-Up

The fact that stock prices of a target shows a significant increase in the weeks prior to a public announcement is something that has been observed in a number of studies. Researchers have usually explained this run-up either as a sign of insider trading or as confirmation of the effective market hypothesis Jarrell and Poulsen (1989b) and Keown and Pinkerton (1981).

However, it's beyond the scope of this thesis to test whether run-ups are due to insider trading or is a confirmation of the effective market hypothesis. Instead we are interested in testing how market anticipation or takeover anticipation affects target shareholder returns around the announcement of a deal. Croci et al. (2009) examine, among other things, how target abnormal returns are related to the market anticipation of a takeover. Using a sample of 2110 successful M&A deals in the US from 1996-2005. The authors find that the run-up period return has a statistically significant negative relationship with target returns. Bauguess et al. (2009) also use the market adjusted run-up return for target companies as an approximation of takeover anticipation. Using a sample of 1668 takeovers in the US from 1996 to 2005 the authors also find that the run-up return is statistically negatively related to target returns around the announcement.

The findings summarized above are consistent with the market anticipation hypothesis. Because a company that is considered as being more likely to be a target should have showed higher returns in the period before the announcement and therefore the announcement effect should be smaller.

2.4.6 Strategic buyers vs. Private Equity Firms

During the past decade private equity firms has become an important part of the M&A market. During the years of 2003-2007 corporate takeovers by private equity firms rose from 6 percent to 30 percent, with deal values rising from $30 billion in 2001 to $450 billion in 2007 in the US (Boone, and Mulherin, 2008; Officer, Ozbas and Sensoy, 2008). With the increased presence of private equity firms in M&A transactions, researchers have started to investigate the differences in deals that are performed by strategic and private equity investors. Studies have shown that target shareholders receive a lower premium when being approached by a private equity investor compared to a strategic investor (Bargeron, Schlingemann, Stulz and Zutter, 2009; Roosenboom, Fidrmuc and Teunissen, 2009).

Bargeron et al. (2009) argues that this difference is due to the fact that private equity bidders are more selective in the price they are willing to pay than strategic buyers. Further, the authors argue that the management of strategic buyers is willing to pay more for the target firm because they don't bear the full costs of their decision. Also, management has an empire-

building mentality.

Studies examining the relationship between the type of acquirer and target company returns show that shareholders of companies being bought by private equity firms experience a lower return on their stock.

2.4.7 Control Variables

Himmelberg, Hubbard and Darius (1999) argue that leverage can be used as a proxy for measuring moral hazard within a firm. Croci et al. (2009) and Bauguess et al. (2009) include leverage as a determinant for premiums of target companies. The authors find a weak negative relationship between target premiums and leverage, being statistically significant at the 10 percent level.

Following the work of Schwert (2000), Officer (2003) and Croci et al. (2009) we also include size of the target company as a determinant of their abnormal returns, size is measured as the log of the market capitalization for a firm. Schwert (2000) finds a weak negative relationship between premium and size while Croci et al. (2009) and Officer (2003) finds this relationship as being statistically significant at the 10 percent level. Also, Himmelberg et al. (1999) argue that larger firms might be subject to problem of moral hazard and managerial discretion. Bauguess et al. (2009) use the natural logarithm of sales as a determinant for target returns and managerial discretion. The authors finds a statistically, at the 1 percent level, negative relationship between target returns, measured as the three day cumulative abnormal return around the announcement date.

In line with Croci et al. (2009) our sample also includes the years 1998-2000 when the dotcom bubble was present and to control for any abnormalities that might be due to the M&A wave in conjunction with this bubble. To control for this we include a dummy variable that takes the value 1 if the deal was posted after the year of 2001 and the value of 0 if the deal was posted prior to 2002.

3. Hypotheses

In this section we present the various hypotheses being tested in our paper. The hypotheses are based on the theoretical discussion in the previous chapter. First, the hypothesis regarding the performance of Swedish target companies being approached with a tender offer is presented. Secondly, we present our hypotheses concerning the determinants of the target companies returns.

3.1 Target Performance in Tender Offers on the Swedish market

As mentioned earlier assuming semi-strong efficiency in the market implies that an announcement and its effects should be immediately incorporated in the price of the company's stock. Previous research on target performance shows consistent results, that on average a tender offer increases the value of the target company. Results are similar both over time, across markets and methods being applied. However, from previous research the level of the positive announcement returns varies across studies. We formulate our first hypothesis that target return is equal to zero. Following the discussion above we expect to reject our first hypothesis.

Hypothesis 1: Target abnormal returns are equal to zero.

3.2 Determinants of target performance

3.2.1 Method of payment

Previous research has shown some consensus regarding the effects of method of payment on target returns, where cash bids has yielded the highest returns target shareholders. This is due to the fact that the immediate payment of tax when being faced with cash bids and because a cash bid conveys positive information about synergies that can obtained by combining the target company with the bidder. We now formulate our second hypothesis, that the method of payment shouldn't affect the returns for target companies. Following the theory and previous research we expect to reject the null hypothesis.

Hypothesis 2: Target returns are not affected by the method of payment

3.2.2 Tobin's Q

Previous studies have shown a negative relationship between the level of Tobin's Q and the announcement returns to target shareholders. This relationship can be explained by interpreting Tobin's Q as a measurement of mispricing, and when a company is faced by a bid their share price will correct itself. Another way of interpreting Tobin's Q is as a measurement of possible improvement in a company, where companies with a low Tobin's Q has a greater room for improvement which can be divided between the bidder and the target company yielding a higher return for target shareholders. We formulate our null hypothesis: that Tobin's Q shouldn't have any effects on target returns. According to the discussion above we expect to reject this hypothesis.

Hypothesis 3: Tobin's Q does not have any effects on target returns

3.2.3 Successful vs. Unsuccessful Tender Offer

Studies investigating the relationship between the successfulness of a tender offer and target returns haven't shown any statistically significant relationship and we therefore expect to not reject the null hypothesis

Hypothesis 4: The successfulness of a tender offer does not affect target returns

3.2.4 Idiosyncratic Volatility

Researchers have previously suggested that companies experiencing a high sigma could be considered as being more uncertain and more difficult to value, thus, one would expect a higher return for these companies. As mentioned earlier there has only been one article that investigates this subject, Croci et al. (2009), and they find that there is a positive relationship between sigma and target announcement returns. Therefore we expect to reject our null hypothesis.

Hypothesis 5: Idiosyncratic volatility has no effect on target returns

3.2.5 Stock price run-up

Companies that are anticipated to be takeover targets experience high return in the period preceding the announcement of a deal and lower returns around the days of the announcement, according to the market anticipation hypothesis. Previous studies have confirmed this negative relationship. Therefore we expect to reject our null hypothesis.

Hypothesis 6: There is no relationship between target returns and the level of stock price run-up.

3.2.6 Strategic buyers vs. Investment company buyers

Several previous studies have shown that target receives a lower premium when the bid is made by a private equity firm. This is explained by the fact that these firms are more selective because they bear the full cost of their decision and doesn't have an empire building mentality, which could be the case for management of strategic buyers. Following the discussion above we expect to reject our null hypothesis

Hypothesis 7: Returns of target companies should not be affected by buyer type

4. Method

In this chapter we will provide the reader with the methodological approach to our study and its validity and reliability.

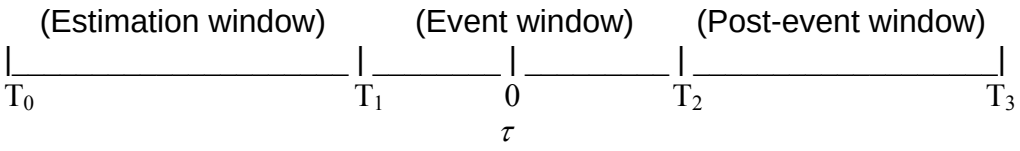
4.1 The Event Study

The research methodology most commonly used when measuring M&A profitability has been the event-study framework (Bruner, 2002). This methodology has been extensively used to test the impact of some economic event on stock prices. Further, it is assumed that the impact of the economic event is instantly reflected in the stock price. We will apply MacKinlay's (1997) procedure when conducting our method.

Event Definition

Since the purpose of this study is to examine the behaviour of the stock prices around a tender offer, the primary issue is to select the event day. A majority of previous studies within this field have been using the day of announcement as the event day, see for example Jensen and Ruback (1983) and Brown and Warner (1985), therefore we also to apply the announcement day as the event day. Below, in figure 1, we present the outline of an event study.

Figure 1.



The distance between T_0 and T_1 is the length of the estimation window, denoted as L_1. The event window stretches from T_1 to T_2, denoted as L_2. Further, τ_1 to τ_2 is the event window being investigated where $T_1 < \tau_1 \leq \tau_2 \leq T_2$.

Thereafter we define our event window. A majority of previous research has chosen an event window that is rather short, however, the number of days included varies over studies see for

example Bruner (2002) and Campa and Hernando (2004). Campell, Lo and MacKinlay (1997, p. 149) suggests that assuming semi strong efficiency, which implies that news of a tender offer will instantly be incorporated in the security's price; hence the estimation window should be estimated over a rather short period. Another motivation for using a short event window is the possibility of contamination that can occur when using a longer event window, meaning that the event that is being observed is affected by other events and any conclusions being drawn from the data are inadequate (Armitage, 1995).

Based on the discussion above and previous research, see for example Croci et al. (2009) and Bauguess et al. (2009), we have chosen to use a three day period when measuring abnormalities in the stock price behaviour [-1, 1]. The motivation for including the day after the announcement is due to the fact that one wants to capture the price effects that occur after the stock exchange closes on the announcement day (Campell et al., 1997, p. 151; MacKinlay, 1997).

As previously mentioned there is a wide variety of event windows used. Therefore, we think it would be reasonable to apply different windows since we think that this would add to the validity of our thesis. The event windows used are [-1,1], [-3,3] and [-5,5], not only will this enable us to capture a slower reaction from the market, due to the announcement, but we will also be able to capture any information leakage to the market prior to the announcement. Lastly, an extension of the event window also means that any over reactions in the market will be subsequently corrected. It is also common for studies to perform their tests using different event windows see for example Danbolt (2004), Bruner (2002) and Campa and Hernando (2004).

Selection criteria

Set forth below is a description of the selection criteria being applied when deciding if a deal should be included in the sample or not. We have chosen to study tender offer announcements for Swedish companies that are listed on the Nasdaq OMX Stockholm stock exchange between 1999-01-01 and 2010-07-12, since Nasdaq OMX Stockholm doesn't provide data prior to this period. In order to retrieve our sample of tender offers on Swedish companies from 1999 until present we have used the website of Nasdaq OMX Stockholm stock exchange.

Further, since we want to examine how shareholders wealth changes in conjunction with a tender offer the target firm has to be listed on the Nasdaq OMX exchange. There are cases where the target firms are no longer traded however they were trading during the offer, these companies are included in the sample, hence, we deal with potential survival bias problems. From the Nasdaq OMX Stockholm we retrieve an initial sample of 219 successful and unsuccessful tender offers. From this list we do further reductions due to insufficient data. First, we only include the first bid on a company, due to the fact that multiple bids will affect the estimation period being applied. Secondly, we remove stocks that have not been listed during the whole time period, on which we base our estimations; because we can't estimate abnormal returns for these stocks using the market model. Further, we also remove companies that don't provide data for the determinants being used and we end up with a sample of 172 successful and unsuccessful tender offers. Also, we modified our data so that it doesn't include weekend days for the Swedish market and if the announcement was on a non-trading day the following trading day was used as the announcement day.

Normal and abnormal returns

In this part of the study the normal returns for the companies, included in the sample, are calculated. The normal return is assumed to be the return that the security would yield without the event. In order to make inferences, if there are any statistically significant abnormal returns present, the normal or expected return is compared to the return on the security during the event window.

First, the actual return is calculated for our sample over the event-window. The continuously compounded returns, using the last transaction price, are calculated according to equation (1) below. Due to bid-ask bounce it could be more appropriate to use the average of bid-ask. However, we are not able to retrieve this data for the whole period. The problem, that might be present, when using closing price and not average of bid-ask price, is that the closing price is affected by the last trade. Further, there could be some variance present in the stock even though its intrinsic value remains unchanged. This in turn could yield an upward bias when we quantify abnormal returns (Blume and Stambaugh, 1983). The presence of this problem is more common for smaller firms and since we have some small firms in our sample this

problem could be present. However, we try to mitigate this issue by using different event windows as well as different models when calculating the normal return.

$$R_{i,t} = \ln(P_{i,t=1} / P_{i,t=0}) \qquad (1)$$

Where $P_{i,t=1}$ today's closing price and $P_{i,t=0}$ is yesterday's closing price. Continuously compounded returns are used in order to handle issues concerning non-stationarity in the data. Price data are gathered from the Thomson Reuters Datastream database and they are corrected for splits, dividends and new issues.

In some cases we were not able to obtain quotes for A shares, instead we use only the price on B shares and do not create value weighted portfolios of the two types of shares. This problem arises because the founder sometimes keep A shares and only lets B shares float (Doukas, Holmén and Travlos, 2002).

Thereafter the estimation of abnormal returns has to be defined. MacKinlay (1997) suggests several different methods to calculate this; however, the two most commonly used are the market model and the market adjusted return model. Armitage (1995) summarizes the performance of different estimations models and concludes that most models yield similar results. The market model however always performs, according to the best alternative and can therefore be seen as the most trustworthy model. Further, Brown and Warner (1985) also found that the two models mentioned above often gives the same results as more complicated models. Following the discussion above we think that the use of the two models will increase the validity of our results. If both models yield similar results it would imply that our estimates are reliable and stable.

The difference between the market model and the market adjusted return model is that the latter model constrains alpha and beta to zero respectively one. The market model assumes a linear dependence between a stock's return and the market return over time. A positive feature of the market model compared to the constant mean return model is that a part of the risk adjusted return is being removed from the market return; this is so because the risk of a stock should be captured in the stock's beta. This in turn leads to a decrease in the variance for abnormal returns (MacKinlay, 1997).

Below, both the expected return and the abnormal are defined for the market adjusted return model, equations (2) and (3), and the market model, equations (4) and (5). Where $R_{i,t}$, is the expected return on asset *i* at time *t*, expressed as a function of the expected market return at time *t*. Where $AR_{i,t}$, $R_{i,t}$ and $R_{m,t}$ is the abnormal return, actual return on security *i* at time *t* and the benchmark return at time *t*. α and β are OLS estimators being estimated in the estimation window preceding the event period.

$$R_{i,t} = R_{m,t} + \varepsilon_{it} \quad (2)$$

$$AR_{i,t} = R_{i,t} - R_{m,t} \quad (3)$$

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (4)$$

$$AR_{i,t} = R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t} \quad (5)$$

Estimation procedure

In order to estimate the normal returns we have to estimate the coefficients being used in the models for normal returns. In order to this we need a proxy for the market return. We have chosen Affärsvärldens General Index (AFGX) as a proxy for the market; this is a value weighted index that is adjusted for new issues, splits and dividends. This approach is in line with the approach of Doukas et al. (2002), Sanders and Zdanowicz (1992), Lakonishok and Vermaelen (1990).

When deciding what time period that should be used as estimation period there are no clear evidence on how to choose this period. There are arguments both in favour for using a high frequency data as well as data with lower frequency see for example Merton (1980) and Scholes and Williams (1977). Scholes and Williams (1977) claims that betas measured frequently leads to biased estimates due to non-synchronous trading. Which yield an upward bias for stocks being traded frequently and a downward bias for stocks being traded

infrequently. This implies that data with lower frequency should be used such as weekly or monthly. Following the argumentation of Brown and Warner (1985) one is wrong to assume that the results from Scholes and Williams (1977), who suggests that the use of OLS as estimation model when estimating beta and alpha in an event study, will result in misspecifications. The rationale behind this is that when including an alpha, intercept, one imposes the restrictions that the sum of the residuals, from the model being used, is equal to zero. This modification will lead to an accurate specification of the event study, which is in line with the betas being biased, since this bias will compensated by the bias in the alpha. Since we are using log returns it is fair to assume stationarity, which in turn means that the excess returns for a security during the event period will have a zero mean unconditional on the return of the market. It might be suggested that a misspecification of the event study has occurred due to the bias in the excess return of an individual stock. However this is wrong because the average bias should be equal to zero (Brown and Warner, 1985).

Using the theoretical arguments discussed above we feel that the methods being most appropriate to use are Ahern (2008) and Brown and Warner (1985). Daily returns for 238 days will be calculated and used as the window on which we base our alpha and beta estimates for the market model, [-244, -6].

Peterson (1980) states that the choice of estimation period is a choice between the parameter estimates being more out of date but having a greater accuracy, when the estimation period is expanded.

Testing procedure

In order to be able to draw conclusion whether or not there are abnormal returns present in the event-window, calculations of the average abnormal return are performed for every time period in the window. Aggregation of the average abnormal return is performed for every security, which is the same as the securities cumulative average abnormal return as can be seen below in equation (6) and (7). This is the same as computing the average of each securities cumulative abnormal return, equation (8).

$$\overline{AR_\tau} = \frac{1}{N}\sum_{i=1}^{N} AR_{i\tau} \qquad (6)$$

$$\overline{CAR}(\tau_1,\tau_2)=\sum_{\tau=\tau_1}^{\tau_2}\overline{AR_\tau} \tag{7}$$

$$\overline{CAR}(\tau_1,\tau_2)=\frac{1}{N}\sum_{i=1}^{N}CAR_i(\tau_1,\tau_2) \tag{8}$$

The null and the alternative being tested is the following:

$$H_0:\overline{CAR}(\tau_1,\tau_2)=0$$

$$H_1:\overline{CAR}(\tau_1,\tau_2)\neq 0$$

A t-test is performed in order to make inferences about our hypothesis. To make our inferences we calculate the variance according to equation (9) through (11), where equation (9) is a cross-sectional approach while equations (10) and (11) are the traditional approach where the variance are relying on past returns as oppose to the cross-sectional approach. The cross-sectional approach is used because the traditional approach to calculate the variance uses the estimation period returns when calculating the variance. Which imply that the null hypothesis should be interpreted as that there are no effects on the variance or the mean from the event. However, one might argue that it is rationale to assume that a tender offer might increase the variance but not affect the mean. The cross-sectional approach, presented in equation (9) follows the method suggested by Campbell et al. (1997, pp. 167-168):

$$\hat{Var}\left[\overline{CAR}(\tau_1,\tau_2)\right]=\frac{1}{N^2}\sum_{i=1}^{N}\left(CAR_i(\tau_1,\tau_2)-\overline{CAR}(\tau_1,\tau_2)\right)^2 \tag{9}$$

When using the traditional approach, equation (10) for variance calculations we use the method suggested by MacKinlay (1997). When calculating σ^2_i there are two components in equation (10), the disturbance variance, and the other component is the variance that is due to the sampling error in β and α. However, if the estimation window, L_1, is sufficiently long this component can be assumed to be zero, equation (11). We choose to also calculate the conditional variance displayed in equation (10) consisting of the two components.

$$\sigma^2(AR_{i\tau})=\sigma^2_{e_i}+\frac{1}{L_1}\left[1+\frac{R_{m\tau}-\hat{\mu}_m}{\hat{\sigma}^2_m}\right] \tag{10}$$

$$\sigma^2(AR_{i\tau}) = \sigma^2_{e_i} \tag{11}$$

The disturbance variance is estimated as in equation (12).

$$\hat{\sigma}^2_{\varepsilon_i} = (1/(L_1 - 2)) \sum_{\tau=T_0+1}^{T_1} (R_{i\tau} - \alpha_i - \beta_i R_{m\tau})^2 \tag{12}$$

Where alpha and beta, in equation (12), has been estimated during the estimation window, 244 days prior to the announcement until 6 days prior to the announcement, and L_1 is the length of the estimation period, 238 days. Now we can use both estimation of variance of the individual securities to calculate the variance for the average abnormal return and subsequently the variance for the cumulative average abnormal return, see equations below.

$$\text{var}(\overline{AR}_\tau) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma^2(AR_{i\tau}) \tag{13}$$

$$\text{var}(\overline{CAR}(\tau_1 \tau_2)) = \sum_{\tau=\tau_1}^{\tau_2} \text{var}(\overline{AR}_\tau) \tag{14}$$

When using the cross-sectional approach it is necessary to assume that the abnormal returns are uncorrelated. Brown and Warner (1985) confirm that this is the fact when the event date is not same for all the securities included in the sample, as in our case. Using equation (9) and (14) we can test our hypothesis using the t-statistic obtained from equation (15):

$$J_1 = \frac{\overline{CAR}(\tau_1, \tau_2)}{\sqrt{\hat{Var}\left[\overline{CAR}(\tau_1, \tau_2)\right]}} \tag{15}$$

An alternative way to measure the level of significance for abnormal returns is to use a measurement called standardised cumulative abnormal returns, equations (16), (17) and (18). This method is suggested to be used when the true abnormal return is stable over securities, while the use of the ordinary definition is more appropriate when the true return is higher for

securities experiencing a higher variance (Kolari and Pynnonen, 2008). Where S_{CAR_i} is the standard deviation of cumulative abnormal returns, using the market model, adjusted for the forecast error.

$$SCAR_{i(\tau_1,\tau_2)} = \frac{CAR_{i(\tau_1,\tau_2)}}{S_{CAR_{i(\tau_1,\tau_2)}}} \quad (16)$$

Where $S_{CAR_{i\tau}}$ is the standard deviation of the cumulative abnormal return.

$$\overline{SCAR}(\tau_1,\tau_2) = \frac{1}{N}\sum_{i=1}^{N} SCAR_i(\tau_1,\tau_2) \quad (17)$$

$$J_2 = \left(\frac{N(L_1-4)}{L_1-2}\right)^{1/2} * \overline{SCAR}(\tau_1,\tau_2) \quad (18)$$

4.2 Research approach

In our thesis we have chosen to use a deductive approach, meaning that we will formulate our hypotheses on the basis of the existing literature. After formulating our hypotheses we collect the data in order to be able to test our hypotheses. Thereafter we analyse our findings and conclude if our hypotheses should be rejected or not. We then put our findings in a theoretical framework and analyse them, here we can either confirm the existing theory or new theories can be formulated, hence, a more inductive approach is applied (Bryman and Bell, 2005, pp. 9-12). In this thesis a quantitative research approach is applied in order to examine the behaviour of target returns and possible determinants of this behaviour.

4.3 Reliability

A research paper is considered to have a high degree of reliability if it can be replicated easily. Therefore it is important that the procedures and methods being used are described in detail. Set forth below is a description of our data collection and methods being applied.

Our initial sample of tender offers are collected from the Nasdaq OMX Stockholm homepage, this organisation is a vital part of the Swedish financial industry and is widely used marketplace by both individuals and institutions.

The data in our sample, consisting of stock prices, indices information as well as some firm specific fundamental variables, is collected from the Thomson Retuers Datastream database. Which is a database provided by the School of Economics and Management in Lund, also it is widely used by large institutions and companies. Further, we have also been double checking a couple of the deals with the press releases, in order to confirm the information from our data sources, and found that the information from the press releases matched the information from our data sources. Since the information gathered from the Nasdaq OMX exchange homepage had to be manually transformed in excel there could be mistakes.

The regressions in this study are performed in E-Views, which is must be considered as reliable econometric software. Hence, given correct specifications any statistical inferences made by us using our data should yield correct results.

4.4 Validity

When discussing the validity of a study one divides this matter into two parts, the internal and external validity. Internal validity aims to analyze whether or not the study really measures what was initially proposed by the authors, e.g. is there enough evidence for us so that we can reach the conclusion that one variable has an effect on another variable? (Bryman and Bell, 2003, pp. 33-34).

Our study starts by examining the behaviour of target firm stock prices around a tender offer. Therefore, the first question that had to be addressed was if whether or not effects of announcement can be analysed by studying the behaviour of the stock. If so, then we have to put in place a model that's able to calculate the expected changes if the tender offer wouldn't take place. The time frame being used as event window varies across studies. Further, there is also a variety of ways to calculate the normal return being used. Our methods are in line with previous research regarding these issues. We therefore think that our model has a high degree of validity.

Moreover, we also try to conclude whether or not there are some determinants that explain the target company returns. These variables are selected based on previous studies, thus, we think that the model being chosen has validity.

When discussing the external validity one tries to take a broader view and see if the results being obtained can be put in another setting. Since we are using a quantitative approach with the data being cross-sectional external validity is of great importance (Bryman and Bell, 2003, p. 34). Since there have been several studies in different countries investigating these issues we feel that our approach easily can be put in a different setting. However, our results can only be confirmed if a similar study is conducted in the future.

4.5 Explanatory Regressions

4.5.1 Description of variables

4.5.1.1 Dependent variable – Cumulative Abnormal Return (CAR)

In our regressions we define the cumulative abnormal return as our dependent variable. The explanatory regressions is run with CAR [-1,1], for motivation of the usage of this window see above.

4.5.1.2 Explanatory variables

Method of Payment

We have formulated one hypothesis regarding the method of payment in a tender offer. In order to test this hypothesis, we classify the tender offer according to the method of payment; cash only, shares only or a mix of shares and cash. Here we need two dummy variables, treating shares payment as a "base case".

$CDUM_i$ = Assigned the value 1 if the transaction method of payment is cash only

$MDUM_i$ = Assigned the value 1 if the transaction method of payment is a mix offer consisting of cash and shares

Tobin's Q

As stated above we have included Tobin's Q as a measurement of growth opportunities. We define Tobin's Q as Market to Book-ratio, using the ratio for the last year before the tender offer announcement, which is in line with Dong et al. (2006)

$TobinsQ_i$ = Market to Book-ratio of the target company in tender offer *i*

Successful vs. Unsuccessful

In order to test if successful tender offers yield higher returns to target shareholders than unsuccessful offers we include a dummy variable, assigned the value of one if the offer is successful.

$SDUM_i$ = Assigned the value of 1 if the offer is successful and 0 otherwise

Investing Company vs. Strategic Buyers

Shareholders approached by a bid from an investment company receive lower premium than being faced with a bid from a strategic buyer. This is so because the management of the strategic buyer doesn't bare the full cost of their decision. Adopting the method of Roosenboom et al. (2009) we include a private equity dummy that takes the value of one if the target is approached by an investment firm and zero otherwise.

$IDUM_i$ = Assigned the value of 1 if the tender offer is made by an investment company and 0 otherwise

Idiosyncratic Volatility

Croci et al. (2009) argue that target companies with greater pre-event idiosyncratic volatility

receive considerably larger announcements returns relative to low idiosyncratic volatility companies. The idiosyncratic volatility is calculated according to Croci et al. (2009); hence the standard deviation of market adjusted residuals of daily stock returns. The estimation period spans between t-244 and t-6, where t is the tender offer announcement day.

$IVOL_i$ = The idiosyncratic volatility of target company in tender offer *i*

Stock Price Run-Up

In order to test this we use a run-up period stretching from 244 days before the announcement to 6 days prior to the announcement where we measure the market adjusted buy return for this period. This is in line with the work of Croci et al. (2009).

$SPRU_i$ = The stock price run-up of target company in tender offer *i*

Control Variables

LEV_i = The leverage of target company *i* in the end of the year preceding the tender offer, defined as total debt over total assets

MV_i = The log of target firm *i* market capitalization in the end of the year preceding the tender offer

$SALES_i$ = The log of target firm *i* sales in the end of the year preceding the tender offer

$TDUM_i$ = Assigned the value of 1 if the tender offer was announce after 2001 and 0 otherwise

4.5.2 The Regression Model

$$CAR_i = \alpha + \beta_1 CDUM_i + \beta_2 IDUM_i + \beta_3 TDUM_i + \beta_4 SALES_i + \beta_5 MV_i + \beta_6 LEV_i + \beta_7 SPRU_i + \beta_8 IVOL_i + \beta_9 SDUM_i + \beta_{10} MDUM_i + \beta_{11} Tobins_i \quad (17)$$

The method being applied for estimating α and β_i, in equation (17), is OLS, ordinary least squares. In order to assure that the assumptions of OLS are upheld we will run several tests.

The first assumption of the OLS is that the error term should have an average value of zero, as being described in Brooks (2002, p. 146) when including an intercept term this assumption is upheld.

Secondly, one should have homoscedasticity in the errors meaning that their variance should be constant. When testing this assumption there were two tests to choose between, White´s test (1980) and Goldfeld and Quandt´s test (1965). We choose to use White`s test, see appendix A.3 and A.4, because it has two features that we think motivates it instead of the Goldfeld and Quandt´s test. First, we don't have to determine where it would be appropriate to split our sample since this is have to be done in Goldfeld and Quandt´s test and not in White´s test. Secondly, when using White´s test one doesn´t have to make any assumptions concerning the form of the hetroscedasticity**.** White´s test uses the residuals from our general model and runs them against the explanatory variables looking for parameters being significant. If hetroscedasticity is detected any inferences made could be wrong because our estimates won´t be BLUE, Best Linear Unbiased Estimators. If this is the case one can handle this by using White`s modified standard errors when performing the regressions or one could use GLS, Generalized Least Squares. However, since the use of White`s modified standard error doesn`t force us to make assumptions concerning the form of the hetroscedasticity we will use this method if correction is needed (Brooks, 2002, pp. 147-155).

Moreover the explanatory variables need to be non-stochastic. If the error term of the explanatory variables are independent this assumption is fulfilled. Also, the error terms needs to be normally distributed. As we have a fairly large sample it is fair to assume that the central limit theorem will handle this problem for us. Since sample distribution for larger samples

tends to normality even though the distribution of the population is not normally distributed (Brooks, 2002, pp. 171-208), see appendix A.5.

Further, non-correlation between the explanatory variables is not an assumption for the OLS to be valid, since the estimators will still be BLUE. However, there will be problems in obtaining significance since the standard errors will be large. Surely, there will be some correlations but as long as this multicollinearity is small enough it will not cause any problems (Brooks, 2002, pp. 171-208). We will start by looking at the variance-covariance matrix, using the rule of thumb by Brooks (2002, pp. 147-208) that correlations below 0.8 is considered as non-problematic, see appendix A.2. We will also run auxiliary regression where each explanatory variable will be treated as dependent variable being regressed on the other explanatory variables. If the R^2 being obtained is higher than the R^2 of the initial regression problems with multicollinearity is probably present (Damodar, 2003, pp. 358-362).

Lastly, we will test the functional form of our regression i.e. that it is linear in its parameters. This will be tested using Ramsey RESET test, see appendix A.6 and A.7. This test runs a second regression where the errors from our first model are used being regressed on the powers of the fitted values. If any of the new parameters are significant the model can be assumed to be wrongly specified (Ramsey, 1969).

5 Empirical findings

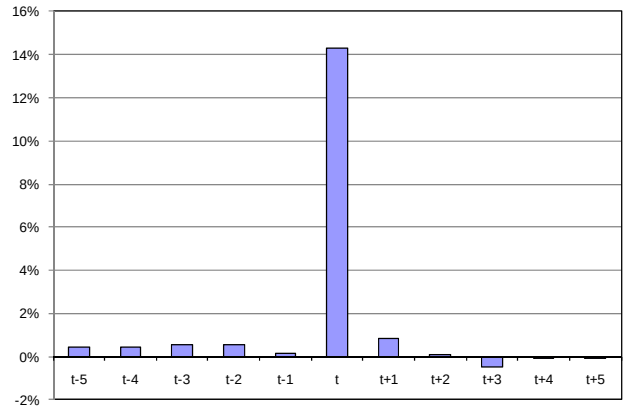
In this chapter we will be presenting our empirical findings. First we present cumulative abnormal returns followed by our explanatory regressions.

5.1 CAAR – Cumulative average abnormal return

Below we display the average abnormal return for the eleven days surrounding the announcement of a tender offer. These calculations have been computed using both variance calculations presented above, see equation (9), (10) and (11). First, we present the results using the cross-sectional approach, figures 2 and 3 followed by the traditional approach, figure 4. Also, the P-values assigned to these days are presented.

Figure 2.

Average Abnormal Returns – market adjusted return (using cross-sectional approach for calculating p-value)

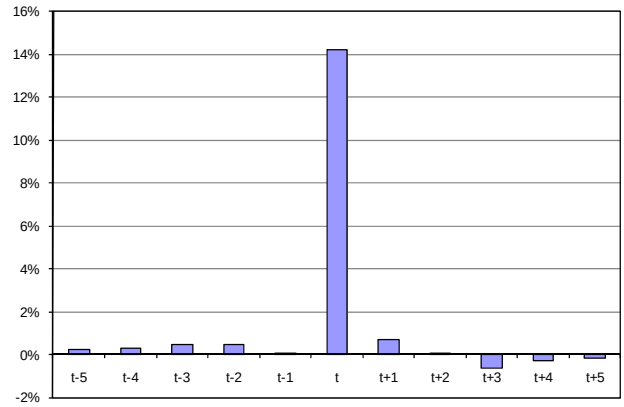


Time	Average AR	P-value
t-5	0,43%	0,150
t-4	0,45%	0,072*
t-3	0,57%	0,024**
t-2	0,55%	0,026**
t-1	0,17%	0,692
t	14,30%	0,000***
t+1	0,85%	0,141
t+2	0,11%	0,765
t+3	-0,47%	0,055*
t+4	-0,09%	0,706
t+5	-0,04%	0,824

***/**/* *indicates significance at the 1, 5 and 10 percent level*

Figure 3.

Average Abnormal Returns – market model (using cross-sectional approach for calculating p-value)



Time	Average AR	P-value
t-5	0,24%	0,414
t-4	0,29%	0,237
t-3	0,45%	0,072
t-2	0,47%	0,057*
t-1	0,04%	0,927
t	14,19%	0,000***
t+1	0,72%	0,212
t+2	0,01%	0,972
t+3	-0,61%	0,014**
t+4	-0,29%	0,201
t+5	-0,16%	0,373

****/**/* indicates significance at the 1, 5 and 10 percent level*

Figure 4.

Average Abnormal Returns - market model and market adjusted return (traditional approach using disturbance variance only for calculating p-values)

Time	Average AR	P-value
t-5	0,24%	0,336
t-4	0,29%	0,253
t-3	0,45%	0,076*
t-2	0,47%	0,065*
t-1	0,04%	0,878
t	14,19%	0,000***
t+1	0,72%	0,005**
t+2	0,01%	0,959
t+3	-0,61%	0,017**
t+4	-0,29%	0,254
t+5	-0,16%	0,530

Time	Average AR	P-value
t-5	0,43%	0,102
t-4	0,45%	0,09*
t-3	0,57%	0,032**
t-2	0,55%	0,037**
t-1	0,17%	0,524
t	14,30%	0,000***
t+1	0,85%	0,002***
t+2	0,11%	0,679
t+3	-0,47%	0,074*
t+4	-0,09%	0,746
t+5	-0,04%	0,880

****/**/* indicates significance at the 1, 5 and 10 percent level*

Figure 5.

Average Abnormal Return – market model (traditional approach using conditional variance for calculating p-values)

Time	Average AR	P-value
t-5	0,24%	0,761
t-4	0,29%	0,690
t-3	0,45%	0,568
t-2	0,47%	0,551
t-1	0,04%	0,957
t	14,19%	0,000***
t+1	0,72%	0,342
t+2	0,01%	0,986
t+3	-0,61%	0,412
t+4	-0,29%	0,698
t+5	-0,16%	0,824

****/**/* indicates significance at the 1, 5 and 10 percent level*

Starting with the cross-sectional approach, when calculating the variance, we can see that the market adjusted return model, figure 2, and the market model, figure 3, yields slightly different results. Both models yield a significant, at the 1 percent level, average abnormal return on the day of the announcement of around 14 percent. Also, both models show significant returns two days prior to the announcement and three days after the announcement, with the significance level of 5 and 10 percent. The market adjusted return model also shows significant returns four days as well as three days prior to the announcement. Turning now to the abnormal returns when using only the disturbance variance as the variance, figure 4, the market adjusted return model yields significant returns four days prior to the announcement otherwise the two models yield significant returns in the same days.

Lastly we can see from figure 5, where we have corrected the variance for sampling error effects, that the average abnormal return looses significance and that the only day being significant is the announcement day. This is in line with what we expected since an increase in the variance, which is due to the inclusion of the variance from the sampling error effect of our alpha and beta estimates, will result in a lower t-value which in turn yields a lower p-value. Also, this seems to be the most proper way and it also shows that abnormal returns only occur on the announcement day, this is reasonable as there should be no abnormal return during the other event days.

Table 1.

Window	(-1;1)	(-3;3)	(-5;5)
Market adjusted return	15,32%***	16,08%***	16,83%***
Cross-Sectional Approach *(test-statistics)*	13.35	13.00	12.44
Traditional Approach *(test-statistics)*	35.69	24.53	20.49

Window	(-1;1)	(-3;3)	(-5;5)
Market Model	14,94%***	15,27%***	15,36%***
Cross-Sectional Approach *(test-statistics)*	13.06	12.42	11.32
Traditional Approach *(test-statistics)*	35.64	23.85	19.13
Traditional Approach Adjusted for Samling Error *(test-statistics)*	11.64	7.63	6.14
SCAR *(test-statistics)*	22.24	22.87	23.32

***/**/* *indicates significance at the 1, 5 and 10 percent level*

As can be seen from the table above, we are able to observe significant, at the 1 percent level, cumulative average abnormal returns across all three event windows and using different test statistics. These findings are consistent for both the market adjusted return model as well as the market model. The cumulative average abnormal return for both models are around fifteen percent for the shortest event window. As previously stated we assume that the market is semi-efficient, which was confirmed in figure 5, therefore we will be using an event window of [-1,1]. This will also help us exclude information that might affect the share price that is not related to the tender offer announcement.

5.2 Explanatory regressions

5.2.1 Descriptive statistics

Below in tables 2, 3 and 4, we present the descriptive statistics for our independent variables. This statistics include mean, median, max, min and standard deviation.

Table 2.

Year	Number of Tender Offers	Leverage Mean	Leverage Median	Leverage Max	Leverage Min	Leverage St Dev	Market Value Mean	Market Value Median	Market Value Max	Market Value Min	Market Value St Dev	Sales Mean	Sales Median	Sales Max	Sales Min	Sales St Dev
1999	22	21,85	21,55	51,03	0,00	16,92	6,85	6,87	9,62	4,43	1,44	14,62	14,84	17,66	11,51	1,81
2000	25	26,94	19,50	77,31	0,00	23,88	6,97	7,00	10,80	3,49	1,62	13,92	13,75	16,58	11,56	1,31
2001	18	16,36	14,69	69,21	0,00	18,74	7,25	7,07	11,24	4,09	2,02	14,41	14,38	17,98	8,97	2,08
2002	6	32,49	29,55	74,70	1,15	24,21	6,04	6,28	8,57	3,54	1,77	14,03	13,44	16,53	11,78	1,91
2003	18	22,55	12,76	74,79	0,00	27,74	6,30	5,98	9,73	2,97	1,94	13,52	13,84	15,58	11,04	1,30
2004	8	17,27	6,33	50,29	0,00	20,51	6,17	5,84	9,40	4,17	1,91	13,72	13,96	15,35	11,82	1,37
2005	12	13,27	5,53	57,68	0,00	18,38	7,05	7,15	10,43	4,82	1,72	12,78	13,41	18,10	0,00	4,55
2006	18	10,67	2,60	46,86	0,00	14,33	7,15	6,98	10,28	5,01	1,50	13,99	13,93	17,93	10,92	1,78
2007	15	14,88	14,16	51,30	0,00	15,37	7,47	7,75	9,61	4,50	1,42	13,97	14,18	15,46	12,20	1,02
2008	14	24,23	18,58	56,67	0,00	17,84	7,14	7,04	9,03	5,14	1,07	14,21	14,43	15,81	12,32	0,93
2009	9	29,96	25,66	77,36	0,00	24,63	5,29	4,97	10,34	2,27	2,31	13,58	13,13	18,33	11,46	2,09
2010	7	18,29	8,93	72,39	0,00	26,11	5,94	6,22	7,35	4,50	1,13	13,32	13,33	14,58	12,01	0,98
	172															

Table 3.

Year	Number of Tender Offers	Run-Up Mean	Run-Up Median	Run-Up Max	Run-Up Min	Run-Up St Dev	Volatiltiet Mean	Volatiltiet Median	Volatiltiet Max	Volatiltiet Min	Volatiltiet St Dev	Tobins Q Mean	Tobins Q Median	Tobins Q Max	Tobins Q Min	Tobins Q St Dev
1999	22	-0,08	-0,08	0,33	-0,52	0,26	0,03	0,03	0,05	0,02	0,01	2,17	1,60	6,11	0,42	1,68
2000	25	0,30	0,19	1,63	-0,30	0,50	0,03	0,03	0,05	0,01	0,01	2,74	1,91	14,53	0,22	2,92
2001	18	-0,04	0,07	1,04	-1,52	0,59	0,03	0,03	0,07	0,02	0,01	2,86	1,35	16,94	0,09	4,46
2002	6	-0,28	0,11	0,22	-1,37	0,69	0,04	0,03	0,07	0,02	0,02	1,12	1,13	1,70	0,62	0,46
2003	18	-0,37	-0,16	0,39	-1,67	0,55	0,04	0,03	0,08	0,01	0,02	1,68	1,09	5,45	0,41	1,40
2004	8	0,31	0,33	0,44	0,09	0,12	0,03	0,02	0,05	0,01	0,01	1,99	1,41	4,38	1,00	1,23
2005	12	0,20	0,32	0,63	-0,50	0,34	0,02	0,02	0,04	0,01	0,01	2,24	2,29	5,50	0,59	1,32
2006	18	0,17	0,19	0,95	-0,43	0,33	0,02	0,02	0,05	0,01	0,01	3,15	2,88	7,19	1,60	1,36
2007	15	0,08	0,07	0,87	-0,35	0,31	0,02	0,02	0,04	0,01	0,01	4,49	2,62	15,53	0,38	4,44
2008	14	-0,52	-0,38	0,02	-1,88	0,52	0,03	0,02	0,06	0,02	0,01	2,21	1,84	6,52	0,81	1,62
2009	9	-0,54	-0,52	0,14	-1,39	0,47	0,04	0,04	0,05	0,02	0,01	0,80	0,54	2,67	0,01	0,77
2010	7	0,42	0,37	1,02	-0,02	0,39	0,04	0,03	0,08	0,02	0,02	3,30	2,04	11,02	1,07	3,47
	172															

Table 4.

		Method of Payment			State of Deal		Buyer Type		Time Dummy	
Year	Number of Tender Offers	Cash	Equity	Mixed	Successful	Unsuccessful	Strategic	Investment	Before 2002	After 2002
1999	22	16	4	2	20	2	17	5		
2000	25	16	8	1	18	7	18	7		
2001	18	7	6	5	13	5	15	3		
2002	6	3	1	2	5	1	6	0		
2003	18	14	2	2	18	0	13	5		
2004	8	5	2	1	8	0	5	3		
2005	12	6	3	3	11	1	10	2		
2006	18	13	1	4	17	1	12	6		
2007	15	13	1	1	12	3	9	6		
2008	15	12	1	1	11	3	5	9		
2009	9	8	1	0	9	0	2	7		
2010	7	4	2	1	7	0	4	3		
	172	117	32	23	149	23	116	56	67	105

Looking at table 4 we can see that before 2002 the annual number of tender offers was at a high and came down after the dotcom bubble and also the activity in the recent years has slowed down due to the financial crisis. Further, from table 4 we can also see that most of the bids are in the form of cash offers and are successful; hence, one could argue that these shouldn't be included in our regression. We have however chosen to include them and we will keep the distribution in mind when analysing our results.

5.2.2 Regressions

$$\begin{aligned} CAR_i = \alpha \; &+ \beta_1 CDUM_i + \beta_2 IDUM_i + \beta_3 TDUM_i \\ &+ \beta_4 SALES_i + \beta_5 MV_i + \beta_6 LEV_i + \beta_7 SPRU_i + \beta_8 IVOL_i \\ &+ \beta_9 SDUM_i + \beta_{10} MDUM_i + \beta_{11} TobinsQ \end{aligned} \qquad (18)$$

As has been previously discussed we have performed several statistical tests on our model, equation (18). To summarise we find no evidence of hetroscedasticity in our sample when using White's test, see appendix A.3. Therefore we perform our regression without the use of standardised robust standard errors. Looking at our test for normality, using the Jarque Bera test, see appendix A.5, we can observe that there is non-normality present. However, since our sample is relatively normality is assumed in line with the central limit theorem. Examining our simple table of correlation coefficients, see appendix A.2, and by running auxiliary regressions we can conclude that there is no evidence of multicollinearity in our sample.

Lastly, the Ramsey RESET-test shows no sign of incorrect specification, concerning our model, see appendix A.6.

$$SCAR_i = \alpha + \beta_1 CDUM_i + \beta_2 IDUM_i + \beta_3 TDUM_i + \beta_4 SALES_i + \beta_5 MV_i + \beta_6 LEV_i + \beta_7 SPRU_i + \beta_8 IVOL_i + \beta_9 SDUM_i + \beta_{10} MDUM_i + \beta_{11} TobinsQ \quad (19)$$

We perform the same test for our SCAR model, equation (19), as those for CAR. The conclusions from these tests are the same as those for CAR, see appendix. There is however one difference between these models, in our SCAR model we have excluded the IVOL, which is the idiosyncratic volatility. This modification is quite trivial if we look at the definition of SCAR. Below follows the results of the multiple regressions for CAR and SCAR.

Table 5.

Regression

Dependent var. CAR
Sample size 172

	Coefficient	Std. Error	t-Statistic	Prob.
C	0,315	0,106	2,981	0,003
CDUM	0,054	0,034	1,562	0,120
IDUM	0,002	0,027	0,090	0,928
TDUM	-0,055	0,025	-2,258	0,025
SALES	-0,003	0,008	-0,354	0,724
MV	-0,019	0,011	-1,806	0,073
IVOL	-0,960	1,118	-0,858	0,392
LEV	0,000	0,001	-0,248	0,804
SPRU	-0,076	0,024	-3,192	0,002
SDUM	-0,009	0,034	-0,251	0,802
MDUM	0,028	0,042	0,655	0,514
TOBINSQ	0,012	0,005	2,466	0,015

R-squared	0,145
Adjusted R-squared	0,086

Table 6.

Regression				
Dependent var. SCAR				
Sample size 172				
	Coefficient	Std. Error	t-Statistic	Prob.
C	6,402	3,589	1,784	0,076
CDUM	3,517	1,370	2,568	0,011
IDUM	1,401	1,091	1,284	0,201
TDUM	-1,249	1,000	-1,249	0,214
SALES	-0,354	0,327	-1,082	0,281
MV	0,095	0,379	0,249	0,804
LEV	0,009	0,023	0,379	0,705
SPRU	-1,441	0,940	-1,532	0,127
SDUM	0,162	1,388	0,117	0,907
MDUM	2,139	1,720	1,243	0,216
TOBINSQ	0,436	0,192	2,267	0,025
R-squared	0,103			
Adjusted R-squared	0,047			

We only present the multiple regressions and we can see that there are some significant variables. Theses variables are also found significant in singular regressions. First, looking at our CAR-model, table 5, we can observe that our, market value, time dummy and Tobin's q coefficients are significant at the 10 and 5 percent level, while the stock price run-up and the intercept is significant at the 1 percent level. The R^2 of the model is low, yet the model has some explanatory power. Looking at our SCAR-model, table 6, the intercept is significant at the 10 percent level, while our cash dummy and Tobin's q coefficients are significant at the 5 percent level. The R^2 of our SCAR-model is even lower than the R^2 for the CAR model. These findings will be summarised and analysed in chapter 6.

6 Analysis of the hypotheses

In this chapter we compare our initial hypotheses with our empirical findings.

6.1 Analysis

Hypothesis 1: Target abnormal returns are equal to zero.

Our empirical results show that target company shareholders experience statistically significant positive abnormal returns of around 15 percent in conjunction with a tender offer. Hence we reject our first hypothesis. Both the result of the returns being positive as well as the level of them are in line with previous research see for example Bruner (2002), Campa and Hernando (2004) and Haleblian et al. (2009) who presents results from various markets, time periods and different event-windows.

Hypothesis 2: Target returns are not affected by the method of payment

Our empirical findings suggest that we can't reject the above hypothesis. This finding is not in line with the work of Huang and Walkling (1987), Asquith et al. (1990) and Wansley et al. (1983). These authors explain this difference by using two different theoretical approaches, first the immediate tax effect of a cash bid is presented, secondly a cash bid reveals positive information about possible synergies in a deal. One possible explanation to why we are not able to observe any differences concerning payment method and target return could be the ownership structure of the target firm, since different types of owners follows different tax regulations.

Hypothesis 3: Tobin's Q does not have any effects on target returns

According to our empirical findings we reject the null hypothesis. Our findings suggest that there is a positive relationship between CAR and the level of Tobin's Q, at a five percent significance level. The coefficient obtained implies that a one unit increase in the Price/Book ratio yields an increased return of 1.2 percent. This finding is not in line with previous

research who has found a negative relationship between these variables; see for example Dong et al. (2006) and Servaes (1991). One possible reason to why our results differ from previous research might be that there is a large majority of strategic buyers compared to investment buyers. Investment companies are more likely to engage in multiple expansion, i.e. buying companies with low Price/Book ratio, after an acquisition than strategic buyers are. Instead strategic buyers are often looking for ways to integrate operations between the two entities being combined and thereby obtaining synergies and by doing so the multiple expansion is not an important factor when acquiring a company.

Hypothesis 4: The successfulness of a tender offer does not affect target returns

The result of our regression model implies that we do not reject our null hypothesis and thereby we conclude that the returns of target companies are not dependent on the successfulness of the deal. This finding is in line with the work of Schwert (1996) and Jensen and Ruback (1983), these authors' claims that the announcement of a deal reveals new information and by doing so shares that was previously undervalued can now be priced more accurately. Also, the announcement could enable the managers to implement a higher valued strategy, which should be reflected in the share price.

Hypothesis 5: Idiosyncratic volatility has no effect on target returns

As can be seen from our regression output we do not reject our null hypothesis and by doing so we conclude that we can't find a significant relationship between the level of volatility and the returns for the target company around the announcement. Since research investigating this relationship is limited, the only study that we have found that investigates this issue is Croci et al. (2009). Their results implied that companies with higher idiosyncratic volatility prior to the announcement experienced higher returns, the authors claims that companies that have higher sigma is considered to be more risky and should therefore experience a higher return.

Hypothesis 6: There is no relationship between target returns and the level of stock price run-up

We find that there is a significant negative relationship between these two variables and by doing so we reject our null hypothesis. This finding is consistent with the work of Bauguess et al. (2009) and Croci et al. (2009). These authors view this relationship as an approximation of

takeover anticipation and a confirmation of the market anticipation hypothesis. Thereby our findings are a confirmation of these hypotheses.

Hypothesis 7: Returns of target companies should not be affected by buyer type

Our result implies that we can't reject this hypothesis. This result is not in line with previous studies who have found that firms being approached by an investment company experience a lower return see for example Bargeron et al. (2009) and Roosenboom et al. (2009).

6.2 Other findings

As can be seen from our regression above we also include some control variables. Of these control variables our time dummy and market value shows statistical significance, at the 5 and 10 percent level. Both of these findings are consistent with the work of Croci et al. (2009), concerning both the level of significance as well as the sign of the coefficients. The significance of our time dummy implies that deals that were posted from 2002 and onwards yielded a lower return than deals posted prior to 2002. One possible explanation for the weak significance for the market value variable could be that smaller companies, hence smaller market capitalisation, could be viewed as more risky and thereby the return should be higher for these firms.

Further, as can be seen from table 6, above, we performed a similar analysis for SCAR as the one for CAR and found some significant relationships. Tobin's Q stays significant in both the regressions using CAR or SCAR as dependent variable, where SCAR is adjusted for the level of volatility, implying that Tobin's Q has an impact on the announcement return standardized or not. The time dummy, market value and stock price run-up coefficients are no longer statistically significant in our SCAR analysis. Also, we can see that our cash dummy becomes positively significant.

7 Concluding remarks

7.1 Conclusions

Previous researches that have been investigating target company announcement returns in conjunction with a tender offer have shown that target companies' shareholders earn abnormal returns. Our results are in line with these findings. We find that target shareholders gain approximately 15 percent abnormal returns around the days of the announcement, when using different models and short-run event windows. These results are statistically significant at the 1 percent level, thus, our findings add more consensus to previous research and a conformation of markets showing semi-strong efficiency. However, previous research has shown that target shareholders gain an average abnormal return in the 20-30 percent range. Our finding is below this average, implying that the bid premium seems to be lower on the Swedish market.

The second part of our thesis investigates possible explanations of the abnormal returns. This is done by using cross-sectional regression, where the determinants being used are selected according to theory and previous research. We find that the two of the variables, Tobin's Q and stock price run-up, are significant. The negative relationship between CAR and stock price run-up is consistent with previous research, which could possibly be a confirmation of the market anticipation hypothesis. Further, the positive Tobin's Q coefficient is not in line with previous studies which have observed a negative relationship. This result indicates that a company with high Tobin's Q experience higher announcement returns which could be explained by the fact that acquiring firms are willing to pay more for firms with high growth opportunities or higher managerial effectiveness. This is not in line with previous research that has found that bidder firms are willing to pay more for badly or undervalued companies, i.e. companies with low Tobin's Q.

Several other variables showed lack of significance where we had expected the difference. From previous literature we can conclude that there has been some differences in the results for the variables, also, some of the variable has not been studied extensively. We provided the reader with some possible explanations for this lack of significance. However, since our sample is limited and for a specific time period we cannot draw the conclusion that these variables doesn't have an effect on announcement returns.

7.2 Further Research

As we have mentioned earlier there has been extensive research on announcement returns for target returns and determinants trying to explain abnormalities. However, there are different research approaches still left to be taken.

Since our sample only includes deals that were announced after 1998 it would be interesting to expand this period of time. Also, one interesting way to enlarge the sample could be to include all the Nordic countries for example, this could also mean that one could be able to obtain a sample large enough so that a specific industry could be investigated. With significantly larger sample it would also be possible to study both target and bidder in tender offers and any possible relationship existing. Further, there are of course a lot of other variables that could be included in a study focusing on only target announcement returns.

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Databases

Datastream Advance 4.0, Thomson Financial Ltd

Appendix

A.1 Data Sample

Announcement Date	Target Company	Bidding Company
1999-01-07	Spectra-Physics	Thermo Instrument Inc.
1999-02-01	BTL	Stinnes AG
1999-02-11	Dahl	EQT BV and Ratos AB
1999-03-24	Scandinavian PC Systems	PC-Systemer
1999-03-30	Enator	Tieto Corp. Oyj
1999-04-26	ASG	Danzas AG
1999-04-29	BPA	Procuritas Capital Partners II
1999-04-30	Graphium	Argynnis Industrier
1999-05-12	Gibeck	Hudson RCI Inc.
1999-07-27	Scancem	Heidelberger Zement AG
1999-08-06	SCANIA	Volvo AB
1999-08-10	Eldon	EQT Scandinavia BV
1999-08-16	AGA	Linde AG
1999-09-16	Celsius	SAAB AB
1999-10-04	Wilkenson Handskmakarn	Wedins Norden AB
1999-11-01	Humlegården	Länsförsäkringar
1999-11-15	N&T Argonaut	Simbel
1999-11-19	Monark Stiga	GRIMALDI Industrikoncernen
1999-12-03	Guide	Framtidsfabriken AB
1999-12-15	Emil Lundgren	GTIE S.A.
1999-12-16	Måldata	Sigma AB
1999-12-22	Althin Medical	Baxter Sweden
2000-02-02	Piren	Rodamco N.V.
2000-02-08	Cell Network	Mandator AB
2000-02-09	Balder	Drott AB
2000-02-14	Kjessler & Mannerstråle	Traction
2000-02-17	Evidentia	Claesson & Anderzen Invest
2000-03-22	Mandator/Cell Network	Pixelpark AG
2000-04-04	BT Industries	Toyoda Automatic Loom Works
2000-04-10	Perstorp	Perstorp Intressenter
2000-04-12	Provobis	Scandic Hotels AB
2000-05-08	Folkebolagen	Lindab AB
2000-05-12	Zeteco	Partek Oyj Abp
2000-05-15	Entra	TietoEnator AB
2000-06-15	Lifco	Carl Benett
2000-07-24	SEC	NetCom AB
2000-08-21	IRO	Van de Wiele

A.1 Data Sample

Announcement Date	Target Company	Bidding Company
2000-08-21	Norrporten	NS Holding AB
2000-08-22	Allgon AB	LGP Telecom Holding AB
2000-08-28	Gylling Optima Batteries AB	Johnson Controls Inc.
2000-09-11	Resco	Fi SYSTEM
2000-09-13	Arete	TurnIT
2000-09-21	Bulten AB	Finnveden AB
2000-09-27	Diös	AP Fastigheter AB
2000-09-28	Avesta Sheffield AB	Outokumpu Steel
2000-10-06	FB Industri Holding AB	Bergman & Beving AB
2000-10-30	Stena Line	Stena AB
2001-01-26	Segerström & Svensson AB	Sanmina Corp.
2001-02-19	ATLE AB	Ratos AB and 3i Group plc
2001-02-21	Sydkraft AB	E.ON Energie AG
2001-03-22	Perstorp AB	Sydsvenska Kemi
2001-04-06	Platzer Fastigheter AB	Fastighets AB Tornet
2001-04-10	Matteus AB	NH Nordiska Holding
2001-04-23	Scandic Hotels AB	Hilton Group PLC
2001-04-30	Spendrups Bryggeri AB	Spendrups Invest AB
2001-05-11	Jacobson & Widmark AB	WSP Group PLC
2001-05-14	Lindab AB	Lindab Intressenter
2001-05-17	Matteus AB	Aragon FK
2001-05-31	Friluftsbol. Ekelund & Sagner AB	Fjällräven AB
2001-05-31	FöreningsSparbanken AB	Skandinaviska Enskilda Banken AB
2001-06-21	Lundin Oil AB	Talisman Energy Inc
2001-09-10	AssiDomän AB	Sveaskog
2001-09-24	Ångpanneföreningen AB	Sweco AB
2001-12-10	AU-System AB	Teleca AB
2001-12-28	MediTeam AB	Meda AB
2002-02-18	IMS Data AB	Martinsson Gruppen
2002-04-23	Realia AB	Columna
2002-05-24	Esselte AB	JWCA
2002-07-05	Pronyx AB	Teleca AB
2002-08-01	Sapa AB	Elkem Sweden
2002-08-29	JP Nordiska AB	Kaupthing Bank hf.
2003-01-09	Epsilon AB	Danir
2003-01-21	Allgon AB	LGP Telecom Holding AB
2003-02-02	Europolitan Vodafone AB	Vodafone Group Plc.
2003-02-12	Diffchamb AB	Raisio Group
2003-02-17	Scandiaconsult AB	Rambøll
2003-02-28	Mogul AB	Adera AB
2003-03-20	Mandamus Fastigheter AB	LRF Fastigheter
2003-03-25	Svenska Orient Linien AB	SOL Intressenter
2003-04-07	Biora AB	Straumann Holding AG
2003-06-13	Celtica, Fastighetsab	LjungbergGruppen AB
2003-06-26	Perbio science AB	Fisher Scientific International Inc.
2003-10-20	Tornet, Fastighets AB	Ratos AB
2003-11-03	Graninge AB	Sydkraft
2003-11-21	Pandox AB	APES Holding
2003-11-24	Dimension AB	ProAct IT Group AB
2003-12-01	LGP Allgon Holding AB	Powerwave Technologies Inc.
2003-12-17	Karolin Machine Tool AB	Nordstjernan
2003-12-18	Hoist International AB	Hoist Intressenter
2004-05-06	RKS AB	Sigma AB

A.1 Data Sample

Announcement Date	Target Company	Bidding Company
2004-07-19	Fabege AB	Wihlborgs Fastigheter AB
2004-07-28	Brio AB	Proventus Industrier
2004-08-24	Frango AB	Cognos Inc.
2004-08-31	VLT AB	Intressebolaget
2004-09-29	Song Networks Holding AB	Tele2 AB
2004-11-15	Finnveden AB	Nordic Capital
2004-12-22	I.A.R Systems AB	Nocom AB
2005-01-21	North Atlantic Natural Resources AB	Lundin Mining Corporation
2005-02-10	SAPA AB	Orkla ASA
2005-02-17	Cloetta Fazer AB	Oy Karl Fazer Ab
2005-04-20	Trio AB	Netwise AB
2005-05-12	Riddarhyttan Resources AB	Agnico-Eagle Mines limited
2005-06-02	Intentia International AB	Lawson Software Inc.
2005-06-24	Capona AB	Home Invest AS
2005-06-29	Rörvik Timber AB	Ittur Industrier AB
2005-07-12	Karlshamns AB	BNS Industrier AB
2005-09-02	Skandia Försäkrings AB	Old Mutual plc
2005-11-03	Aspiro AB	Schibsted ASA
2005-11-22	OptiMail AB	Posten Norge AS
2006-01-09	Resco AB	AcandoFrontec AB
2006-01-23	Klippan AB	Weland AB
2006-02-08	Glocalnet AB	Telenor ASA
2006-02-08	Trio AB	Teligent AB
2006-04-03	Gambro AB	Indap AB
2006-04-13	Strålfors AB	Posten
2006-05-09	JC	RNB Retail and Brands
2006-06-20	Biacore International AB	GE Healthcare
2006-06-30	Medicover Holding S.A	Celox S.A
2006-07-28	Senea AB	Kamstrup A/S
2006-08-21	WM-data AB	LogicaCMG plc
2006-09-01	Capio AB	APAX and Nordic Capital
2006-09-11	NEA AB	Segulah Alfa AB
2006-09-18	Scania AB	MAN AG
2006-10-02	Cybercom Group Europe AB	JCE Group AB
2006-10-02	Semcon AB	JCE Group AB
2006-11-08	Custos AB	SPX Corporation
2006-11-20	Protect Data AB	Check Point Software Technologies Ltd.
2007-01-15	Pergo AB	Pfleiderer Sweden AB
2007-01-15	TradeDoubler	AOLS Holdings AB
2007-02-19	Sardus AB	Atria Koncern Abp
2007-04-26	Invik & Co. AB	Milestone ehf.
2007-05-25	OMX AB	NASDAQ Stock Market Inc.
2007-08-13	Lindex AB	KappAhl Holding AB
2007-08-20	SalusAnsvar AB	DnB NOR Bank ASA
2007-08-27	Nefab AB	NPNC Intressenter AB
2007-09-24	All Cards Service Center AB	XPonCard Group AB
2007-10-08	Mandator AB	Fujitsu Services
2007-10-22	Academedia AB	Bure Equity AB
2007-10-29	KMT Group AB	Nordstjernan AB
2007-11-06	Telelogic AB	IBM Corporation
2007-11-13	Securitas Direct	ESML Intressenter AB
2007-12-11	Gant Company AB	Procastor S.A.
2008-01-14	Human Care HC AB	GGC Health Care LLC

A.1 Data Sample

Announcement Date	Target Company	Bidding Company
2008-02-01	Boss Media AB	GEmed AB
2008-02-19	XPonCard Group AB	Oberthur Technologies S.A.
2008-03-27	Sigma AB	Askerö Utveckling AB
2008-04-30	Cision AB	Triton Fund II
2008-05-16	Ballingslöv International AB	Stena Adactum AB
2008-05-26	Zodiak Television AB	De Agostini Communications S.p.A
2008-06-16	Cloetta Fazer AB	Oy Karl Fazer Ab
2008-06-30	IBS AB	Deccan Value Advisors Fund L.P
2008-07-22	Gunnebo Industrier AB	Segulah Stellata Holding AB
2008-08-27	Broström AB	A.P Møller - Mærsk A/S
2008-10-15	Peab Industri AB	Peab AB
2008-10-31	Teleca AB	Symphony Technology Group LLC
2008-11-03	Q-Med AB	Ivytan AB
2009-01-19	Scania AB	Porsche Automobil Holding SE
2009-02-19	Home Properties AB	Home Invest AB
2009-03-09	Nilörngruppen AB	AB Traction
2009-03-12	Semcon AB	JCE Group AB
2009-04-03	Technology Nexus AB	Ponderus Tecnology AB
2009-04-29	Hemtex AB	Hakon Invest AB
2009-06-26	Din Bostad Sverige AB	Fastighets AB Balder
2009-10-01	Affärsstrategerna AB	Strategisk Holding Sverige AB
2009-11-30	Ledstiernan AB	Thuban AB
2010-01-05	Ticket Travel Group AB	Braganza AS
2010-01-25	NeoNet AB	Orc Software AB
2010-02-10	Tricorona AB	Opcon AB
2010-02-22	Tilgin AB	MGA Holding AB
2010-03-05	Anoto Group AB	Aurora Investment Ltd
2010-04-22	Rörvik Timber AB	Meerwind AB
2010-04-22	AcadeMedia AB	Providence Education International AB

A.2 Matrix of Correlations between the explanatory variables

	CDUM	IDUM	TDUM	SALES	MV	LEV	SPRU	IVOL	SDUM	MDUM	TOBINSQ
CDUM	1,00	0,42	0,13	0,09	-0,06	0,18	-0,10	-0,20	-0,17	-0,57	-0,17
IDUM		1,00	0,16	0,02	-0,12	0,09	-0,19	-0,10	-0,05	-0,20	-0,19
TDUM			1,00	-0,15	-0,10	-0,07	-0,14	-0,08	-0,19	0,02	-0,02
SALES				1,00	0,62	0,18	0,03	-0,28	0,09	0,14	-0,04
MV					1,00	0,08	0,25	-0,51	0,16	0,13	0,27
LEV						1,00	-0,03	-0,11	-0,03	-0,02	-0,21
SPRU							1,00	-0,29	0,00	0,07	0,22
IVOL								1,00	0,03	-0,03	0,05
SDUM									1,00	0,10	0,11
MDUM										1,00	-0,04
TOBINSQ											1,00

A.3 White's test for hetroscedasticity for CAR

Heteroskedasticity Test: White

F-statistic	1.059132	Prob. F(70,101)	0.3920
Obs*R-squared	72.81036	Prob. Chi-Square(70)	0.3857
Scaled explained SS	98.52127	Prob. Chi-Square(70)	0.0139

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 12/14/10 Time: 18:31
Sample: 1 172
Included observations: 172
Collinear test regressors dropped from specification

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.448414	0.313634	-1.429735	0.1559
CDUM	0.107003	0.138868	0.770540	0.4428
CDUM*IDUM	-0.006130	0.039045	-0.156997	0.8756
CDUM*TDUM	0.014516	0.024232	0.599049	0.5505
CDUM*SALES	-0.004298	0.016550	-0.259705	0.7956
CDUM*MV	-0.005965	0.016770	-0.355730	0.7228
CDUM*LEV	0.000703	0.000727	0.967066	0.3358
CDUM*SPRU	0.005227	0.025135	0.207975	0.8357
CDUM*IVOL	-0.001770	1.213792	-0.001458	0.9988
CDUM*SDUM	0.066655	0.039663	1.680546	0.0959
CDUM*TOBINSQ	-0.007925	0.007706	-1.028360	0.3062
IDUM	-0.003943	0.117612	-0.033530	0.9733
IDUM*TDUM	0.023923	0.018375	1.301939	0.1959
IDUM*SALES	0.000745	0.008252	0.090276	0.9282
IDUM*MV	-0.001089	0.009498	-0.114633	0.9090
IDUM*LEV	0.000437	0.000414	1.055797	0.2936
IDUM*SPRU	0.009073	0.021002	0.432011	0.6667
IDUM*IVOL	-0.914886	1.028354	-0.889660	0.3758
IDUM*SDUM	-0.013668	0.031472	-0.434290	0.6650
IDUM*TOBINSQ	-0.003028	0.007170	-0.422394	0.6736
TDUM	-0.047640	0.090592	-0.525878	0.6001
TDUM*SALES	-0.003264	0.007947	-0.410774	0.6821
TDUM*MV	0.004691	0.009354	0.501514	0.6171
TDUM*LEV	0.000253	0.000428	0.590821	0.5560
TDUM*SPRU	-0.004727	0.021172	-0.223282	0.8238
TDUM*IVOL	1.594751	1.182402	1.348739	0.1804
TDUM*SDUM	0.005210	0.024212	0.215195	0.8300
TDUM*MDUM	0.023597	0.029449	0.801295	0.4248
TDUM*TOBINSQ	-0.008715	0.007244	-1.203049	0.2318
SALES	0.054817	0.031495	1.740513	0.0848
SALES^2	-0.000651	0.001337	-0.486421	0.6277
SALES*MV	-0.003585	0.004169	-0.859837	0.3919
SALES*LEV	0.000197	0.000175	1.122301	0.2644
SALES*SPRU	-0.014893	0.010017	-1.486826	0.1402
SALES*IVOL	-0.432009	0.504199	-0.856823	0.3936
SALES*SDUM	-0.030168	0.018642	-1.618262	0.1087
SALES*MDUM	0.014240	0.021262	0.669732	0.5046
SALES*TOBINSQ	-0.000427	0.002465	-0.173327	0.8627
MV	-0.001792	0.036983	-0.048444	0.9615

A.3 White's test for hetroscedasticity for CAR

MV^2	0.004315	0.003234	1.334001	0.1852
MV*LEV	-0.000240	0.000213	-1.122050	0.2645
MV*SPRU	0.006157	0.008951	0.687878	0.4931
MV*IVOL	0.458935	0.567191	0.809136	0.4203
MV*SDUM	0.015837	0.016779	0.943826	0.3475
MV*MDUM	-0.017100	0.021012	-0.813795	0.4177
MV*TOBINSQ	-0.006484	0.003053	-2.124194	0.0361
LEV	-0.002563	0.002513	-1.019659	0.3103
LEV^2	2.15E-06	8.35E-06	0.257417	0.7974
LEV*SPRU	0.000553	0.000604	0.915898	0.3619
LEV*IVOL	0.012846	0.026910	0.477390	0.6341
LEV*SDUM	0.001172	0.000851	1.376525	0.1717
LEV*MDUM	0.000904	0.000858	1.054533	0.2942
LEV*TOBINSQ	2.85E-05	0.000174	0.163670	0.8703
SPRU	0.106373	0.116352	0.914229	0.3628
SPRU^2	0.004685	0.015022	0.311886	0.7558
SPRU*IVOL	1.365050	0.759267	1.797853	0.0752
SPRU*SDUM	0.004894	0.025995	0.188249	0.8511
SPRU*MDUM	0.017767	0.037725	0.470961	0.6387
SPRU*TOBINSQ	-0.005211	0.004092	-1.273564	0.2057
IVOL	1.015968	5.936738	0.171132	0.8645
IVOL^2	38.01990	39.78283	0.955686	0.3415
IVOL*SDUM	-1.100384	1.836179	-0.599279	0.5503
IVOL*MDUM	-0.157978	1.541931	-0.102454	0.9186
IVOL*TOBINSQ	-0.691507	0.225284	-3.069490	0.0028
SDUM	0.279779	0.212257	1.318113	0.1904
SDUM*MDUM	0.046271	0.036906	1.253762	0.2128
SDUM*TOBINSQ	0.003593	0.005937	0.605087	0.5465
MDUM	-0.113652	0.192405	-0.590693	0.5560
MDUM*TOBINSQ	0.002187	0.010351	0.211312	0.8331
TOBINSQ	0.085524	0.031687	2.699034	0.0082
TOBINSQ^2	9.26E-05	0.000421	0.220044	0.8263

R-squared	0.423316	Mean dependent var	0.019426
Adjusted R-squared	0.023634	S.D. dependent var	0.034453
S.E. of regression	0.034044	Akaike info criterion	-3.629123
Sum squared resid	0.117058	Schwarz criterion	-2.329867
Log likelihood	383.1046	Hannan-Quinn criter.	-3.101981
F-statistic	1.059132	Durbin-Watson stat	1.906990
Prob(F-statistic)	0.391972		

A.4 White's test for hetroscedasticity for SCAR

Heteroskedasticity Te st: White

F-statistic	0.774351	Prob. F(58,113)	0.8588
Obs*R -squared	48.91909	Prob. Chi -Square(58)	0.7964
Scaled explained SS	53.72894	Prob. Chi -Square(58)	0.6347

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 12/15/10 Time: 11:05
Sample: 1 172
Included observations: 172
Collinear test regressors dropped from specification

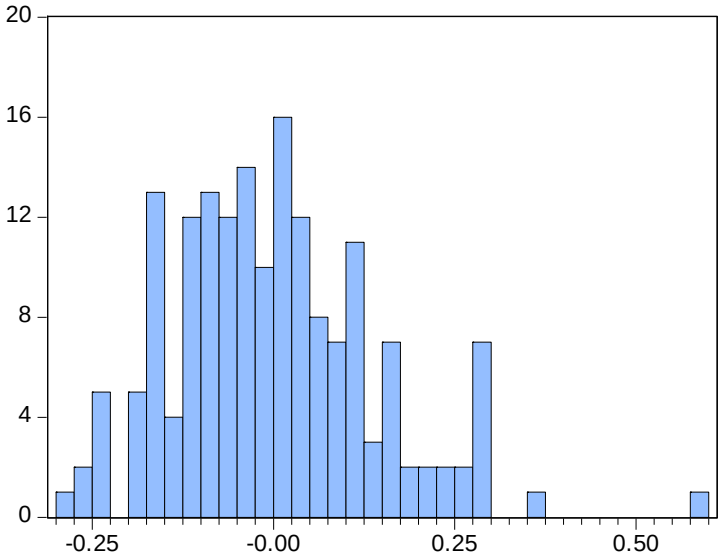
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-274.1775	259.9 990	-1.054533	0.2939
CDUM	169.2985	197.0707	0.859075	0.3921
CDUM*IDUM	29.86023	59.62801	0.500775	0.6175
CDUM*TDUM	14.54137	36.86451	0.394454	0.6940
CDUM*SALES	-8.886061	22.17251	-0.400769	0.6893
CDUM*MV	-7.010671	20.72274	-0.338308	0.7358
CDUM*LEV	0.190802	1.013143	0.188327	0.8510
CDUM*SPRU	30.15217	34.92664	0.863300	0.3898
CDUM*SDUM	128.9393	59.41167	2.170269	0.0321
CDUM*TOBINSQ	-0.375791	11.17270	-0.033635	0.9732
IDUM	-285.1646	153.1927	-1.861476	0.0653
IDUM*TDUM	58.83955	27.03774	2.176201	0.03 16
IDUM*SALES	15.76101	12.13121	1.299212	0.1965
IDUM*MV	-5.553770	12.65274	-0.438938	0.6615
IDUM*LEV	0.692108	0.630215	1.098209	0.2744
IDUM*SPRU	-1.086740	28.42517	-0.038232	0.9696
IDUM*SDUM	-60.68184	44.99231	-1.348716	0.1801
IDUM*TOBINSQ	10.77641	8.938486	1.205619	0.2305
TDUM	36.49213	113.1834	0.322416	0.7477
TDUM*SALES	-2.061118	11.47091	-0.179682	0.8577
TDUM*MV	-3.681198	12.03459	-0.305885	0.7603
TDUM*LEV	-0.073329	0.610487	-0.120116	0.9046
TDUM*SPRU	-7.817571	31.98909	-0.244382	0.8074
TDUM* SDUM	6.643893	34.28486	0.193785	0.8467
TDUM*MDUM	47.39459	42.02273	1.127832	0.2618
TDUM*TOBINSQ	-9.601459	10.61060	-0.904893	0.3674
SALES	22.00099	31.37306	0.701270	0.4846
SALES^2	0.063104	1.645211	0.038356	0.9695
SALES*MV	-3.887880	4.569793	-0.850778	0.3967
SALES*LEV	0.066029	0.238918	0.276368	0.7828
SALES*SPRU	-14.27035	12.21297	-1.168459	0.2451
SALES*SDUM	-35.66172	23.29506	-1.530871	0.1286
SALES*MDUM	20.76219	30.25750	0.686183	0.4940
SALES*TOBINSQ	2.234330	3.481310	0.641807	0.5223
MV	19.18935	40.27817	0.476421	0.6347
MV^2	4.788147	3.330820	1.437528	0.1533
MV*LEV	-0.045121	0.222408	-0.202873	0.8396
MV*SPRU	0.493982	10.99473	0.044929	0.9642
MV*SDUM	12.88510	23.03736	0.559313	0.5771
MV*MDUM	-30.58013	27.36379	-1.117540	0.2661
MV*TOBINSQ	-9.202865	3.900101	-2.359648	0.0200
LEV	-0.351930	3.054640	-0.115212	0.9085
LEV^2	-0.005408	0.011874	-0.455432	0.6497
LEV*SPRU	-0.186273	0.711090	-0.261955	0.7938
LEV*SDUM	0.980150	1.242211	0.789037	0.4317

A.4 White's test for hetroscedasticity for SCAR

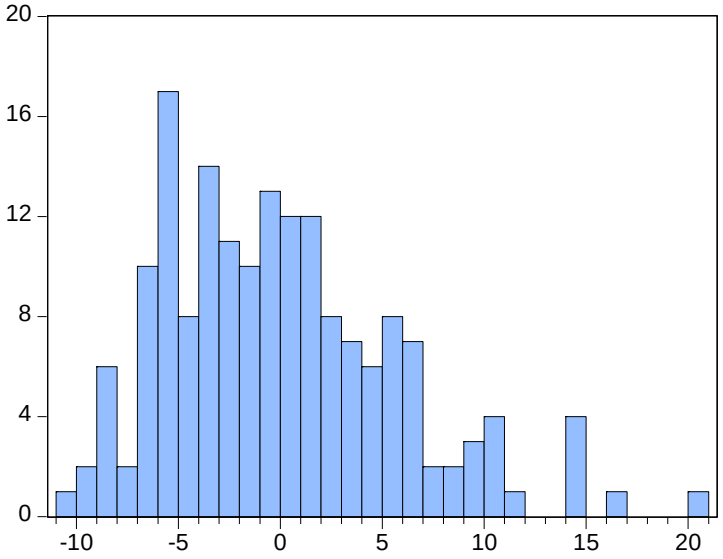
LEV*MDUM	0.487377	1.203319	0.405027	0.6862
LEV*TOBINSQ	-0.196160	0.197849	-0.991465	0.3236
SPRU	162.3305	129.7021	1.251564	0.2133
SPRU^2	-14.08744	13.95780	-1.009288	0.3150
SPRU*SDUM	23.20975	33.45371	0.693787	0.4892
SPRU*MDUM	34.45102	51.24895	0.672229	0.5028
SPRU*TOBINSQ	-0.264604	5.470567	-0.048369	0.9615
SDUM	324.7883	186.6251	1.740325	0.0845
SDUM*MDUM	120.7691	52.53696	2.298746	0.0234
SDUM*TOBINSQ	4.987393	8.560333	0.582617	0.5613
MDUM	-166.5484	285.0491	-0.584280	0.5602
MDUM*TOBINSQ	14.50094	15.97512	0.907720	0.3660
TOBINSQ	46.47724	37.67659	1.233584	0.2199
TOBINSQ^2	-0.094602	0.618543	-0.152943	0.8787

R-squared	0.284413	Mean dependent var	32.78622
Adjusted R-squared	-0.082879	S.D. dependent var	52.06430
S.E. of regression	54.17888	Akaike info criterion	11.08840
Sum squared resid	331694.7	Schwarz criterion	12.16806
Log likelihood	-894.6023	Hannan-Quinn criter.	11.52645
F-statistic	0.774351	Durbin-Watson stat	1.811462
Prob(F-statistic)	0.858849		

A.5 Jarque Bera normality test for CAR and SCAR



Series: Residuals	
Sample 1 172	
Observations 172	
Mean	-3.69e-17
Median	-0.014918
Maximum	0.591794
Minimum	-0.278143
Std. Dev.	0.139783
Skewness	0.716507
Kurtosis	4.127402
Jarque-Bera	23.82604
Probability	0.000007



Series: Residuals	
Sample 1 172	
Observations 172	
Mean	-9.60e-16
Median	-0.442891
Maximum	20.47206
Minimum	-10.08012
Std. Dev.	5.742643
Skewness	0.770929
Kurtosis	3.507062
Jarque-Bera	18.88014
Probability	0.000079

A.6 Ramsey RESET test for the functional form of our CAR-regression

Ramsey RESET Test:

F-statistic	0.133150	Prob. F(1,159)	0.7157
Log likelihood ratio	0.143976	Prob. Chi-Square(1)	0.7044

Test Equation:
Dependent Variable: CAR
Method: Least Squares
Date: 12/14/10 Time: 18:58
Sample: 1 172
Included observations: 172

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.379727	0.206845	1.835804	0.0683
CDUM	0.066336	0.048959	1.354944	0.1774
IDUM	0.003683	0.027052	0.136149	0.8919
TDUM	-0.071697	0.050842	-1.410210	0.1604
SALES	-0.003681	0.008398	-0.438258	0.6618
MV	-0.023912	0.016512	-1.448103	0.1496
LEV	-0.000189	0.000576	-0.328117	0.7433
SPRU	-0.097905	0.064656	-1.514248	0.1319
IVOL	-1.131065	1.215484	-0.930547	0.3535
SDUM	-0.010504	0.034448	-0.304933	0.7608
MDUM	0.035141	0.047075	0.746477	0.4565
TOBINSQ	0.015409	0.010773	1.430289	0.1546
FITTED^2	-0.974250	2.669930	-0.364897	0.7157

R-squared	0.145778	Mean dependent var	0.149993
Adjusted R-squared	0.081308	S.D. dependent var	0.151177
S.E. of regression	0.144901	Akaike info criterion	-0.952959
Sum squared resid	3.338414	Schwarz criterion	-0.715067
Log likelihood	94.95446	Hannan-Quinn criter.	-0.856440
F-statistic	2.261191	Durbin-Watson stat	1.843112
Prob(F-statistic)	0.011364		

A.7 Ramsey RESET test for the functional form of our SCAR-regression

Ramsey RESET Test:

F-statistic	1.545438	Prob. F(1,160)	0.2156
Log likelihood ratio	1.653374	Prob. Chi-Square(1)	0.1985

Test Equation:
Dependent Variable: SCAR
Method: Least Squares
Date: 12/15/10 Time: 11:06
Sample: 1 172
Included observations: 172

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.84970	5.660149	2.093532	0.0379
CDUM	7.883245	3.768859	2.091679	0.0380
IDUM	3.828162	2.235561	1.712395	0.0888
TDUM	-2.875423	1.645717	-1.747217	0.0825
SALES	-0.852346	0.517004	-1.648625	0.1012
MV	0.251798	0.399354	0.630514	0.5293
LEV	0.024674	0.026193	0.941991	0.3476
SPRU	-3.721178	2.060635	-1.805840	0.0728
SDUM	0.654969	1.440828	0.454578	0.6500
MDUM	4.534253	2.581077	1.756730	0.0809
TOBINSQ	1.181368	0.629452	1.876820	0.0624
FITTED^2	-0.132704	0.106747	-1.243157	0.2156

R-squared	0.111704	Mean dependent var	5.796997
Adjusted R-squared	0.050634	S.D. dependent var	6.063812
S.E. of regression	5.908300	Akaike info criterion	6.457808
Sum squared resid	5585.282	Schwarz criterion	6.677400
Log likelihood	-543.3715	Hannan-Quinn criter.	6.546902
F-statistic	1.829109	Durbin-Watson stat	1.719162
Prob(F-statistic)	0.053061		

A.8 Regression output for CAR

Dependent Variable: CAR
Method: Least Squares
Date: 12/14/10 Time: 19:06
Sample: 1 172
Included observations: 172

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.314894	0.105620	2.981380	0.0033
CDUM	0.053635	0.034337	1.562034	0.1203
IDUM	0.002412	0.026754	0.090167	0.9283
TDUM	-0.055469	0.024570	-2.257575	0.0253
SALES	-0.002850	0.008062	-0.353511	0.7242
MV	-0.019332	0.010701	-1.806493	0.0727
LEV	-0.000138	0.000558	-0.248197	0.8043
SPRU	-0.075978	0.023800	-3.192318	0.0017
IVOL	-0.959821	1.118192	-0.858369	0.3920
SDUM	-0.008517	0.033922	-0.251067	0.8021
MDUM	0.027664	0.042268	0.654502	0.5137
TOBINSQ	0.011897	0.004825	2.465520	0.0147

R-squared	0.145063	Mean dependent var	0.149993
Adjusted R-squared	0.086286	S.D. dependent var	0.151177
S.E. of regression	0.144508	Akaike info criterion	-0.963750
Sum squared resid	3.341210	Schwarz criterion	-0.744157
Log likelihood	94.88247	Hannan-Quinn criter.	-0.874655
F-statistic	2.468020	Durbin-Watson stat	1.833256
Prob(F-statistic)	0.007026		

A.9 Regression output for SCAR

Dependent Variable: SCAR

Method: Least Squares

Date: 12/15/10 Time: 10:59

Sample: 1 172

Included observations: 172

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.402064	3.588587	1.784007	0.0763
CDUM	3.517298	1.369890	2.567577	0.0112
IDUM	1.401301	1.091219	1.284162	0.2009
TDUM	-1.248906	0.999955	-1.248963	0.2135
SALES	-0.354065	0.327107	-1.082415	0.2807
MV	0.094548	0.379433	0.249183	0.8035
LEV	0.008652	0.022842	0.378774	0.7054
SPRU	-1.440743	0.940328	-1.532172	0.1274
SDUM	0.162146	1.387563	0.116856	0.9071
MDUM	2.139112	1.720444	1.243349	0.2155
TOBINSQ	0.436194	0.192431	2.266761	0.0247

R-squared	0.103124	Mean dependent var	5.796997
Adjusted R-squared	0.047418	S.D. dependent var	6.063812
S.E. of regression	5.918300	Akaike info criterion	6.455792
Sum squared resid	5639.230	Schwarz criterion	6.657086
Log likelihood	-544.1981	Hannan-Quinn criter.	6.537462
F-statistic	1.851204	Durbin-Watson stat	1.689695
Prob(F-statistic)	0.055784		