

Stock repurchases as an earnings management device

**Improve EPS numbers by stock repurchases to meet
or beat analysts' EPS forecasts**

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Preface

In the master seminar Advanced Financial Accounting I set my interest on stock repurchases related to earnings management. I found prior research (Hribar et al. (2006) and Bens et al. (2003), who concluded that there is a relation between stock repurchases and earnings management.

Later, I found master theses of Theo Bettenhausen and Noortje Meijer, who did research to the relation of stock repurchases and expected EPS growth. Bettenhausen finds that the usage of employee stock options decreases over time. His opinion was the reason for replicating and extending the research of Hribar et al. (2006) instead of the method of Bens et al. (2003). I assume that the decrease of employee stock options does not harm the research outcomes by investigating stock repurchases following the models of Hribar et al. (2006).

Unfortunately, a study of “stock repurchases as an earnings device” is more difficult for a European sample. The European data is insufficient for examining the models of Hribar et al. (2006). The approach of Hribar et al. (2006) is applicable to quarterly financial statements, which is in most cases unavailable for European firms. In the future, European firms are also required to release quarterly financial statements. Maybe then, it is feasible to investigate “stock repurchases as an earnings management device” for a European sample.

In this master thesis, I will use American data to investigate earnings management by stock repurchases. There might be several opportunities to give more insight in stock repurchases and earnings management. The research was more difficult than I expected. René Touw, Chris Knoops, Leen Bijl, Mike Raaijmakers and Onno Lissenberg help me with my master's thesis. I am very grateful for the help of these professionals.

This master's thesis was very hard for me because I am too precise in my research. Everything has to be perfect and extraordinary, and moreover my English writing skills are not so good. My dyslexia makes it hard to express my thoughts in words. That is really frustrating, because I know that I do the research well. This refers to a sentence I spoke in the appointments with dhr. Knoops: “Bright minds are only bright when other people understand what they try to say”.

Abstract

It happens quite often that firms repurchase their shares. The reasons for these repurchase are not always obvious. The high amounts of these repurchases indicates that repurchasing can 'have seriously influence' on firms' financial statements. This master's thesis includes much literature of stock repurchases.

Grullon and Ikenberry (2002) find that firms repurchase stock more than \$ 845 billion from 1995 to 1999. This trend also is conducted by Bozanic (2009), who finds that firms repurchase approximate 6,5 billion shares for an amount of \$222 billion from 2004 to 2006. I find in my investigation that firms listed on the NYSE, AMEX or NASDAQ repurchase approximate 35 billion shares for an amount of \$1088 billion from 1997 to 2003. In the second sample (2004-2009) firms will repurchase stock for an amount of \$2.641 billion. This amount represents approximately 89 billion repurchased shares.

The huge dollar amounts of repurchases from 1997-2003 and 2004-2009 could have huge impact on firms' shares outstanding. Perhaps this can improve firms' earnings per share (EPS) numbers. Following Hribar et al. (2006), I will describe the connection between repurchases and firm performance. Moreover, I will investigate 'whether firms are able to apply earnings management with repurchases?'. Thereby I define my research by the question 'whether managers manage repurchases to meet or beat their EPS forecasts?'

In this thesis, I will draw the opportunities to increase firms' EPS by repurchases. Thereby I compute the EPS-effects of all repurchases following the models of Hribar et al. (2006). These models are modified by my own insights to find more accurate estimates. I changed the models of Hribar et al. (2006) by replacing common shares used to calculate basic EPS + weighted average of the repurchase multiplied by the shares repurchased for common shares outstanding at the beginning of the quarter plus shares issued. This method is more accurate and can be supplemented by a robustness test to illustrate the influence of transaction timing (w). At last, I will document the frequency of accretive repurchases around different forecast error bins¹.

I find a constant growth of annual repurchase amount (\$) from year 1997 to 2007 in this study. But in 2008 and 2009 the credit crunch has a major impact on the annual amount (\$) of repurchases. These years also face an increasing number of (accretive) repurchases.

The results of this study indicate that the number of accretive stock repurchases is disproportional high in quarterly pre-purchase forecast error bins that would have missed the forecast without a repurchase. These accretive repurchases are attributable to 'the increase of EPS by stock repurchases with the intend to meet or beat quarterly analysts' EPS forecasts'. On the other hand I found a disproportional high number of accretive repurchases in the high positive pre-purchase forecast error bins. These accretive repurchases are likely to be related to firms' undervaluation during the repurchases. These research outcomes indicate that EPS management to meet or beat analysts EPS forecasts is applicable for both research samples. These results are similar with the research of Hribar et al. (2006).

¹ The forecast error bins are estimated by the quarterly pre-purchase EPS minus the quarterly consensus analysts' EPS forecast.

List of abbreviations

Abbreviations	Name
Δ	Weighted average
(t)	Quarter of the repurchase
AMEX	American stock Exchange
ASC	Accounting Standard Codification
BE	Basic earnings
CRSP	Centre for Research in Security Price
CSHOPQ	Compustat item # for common shares repurchased
	Compustat item # for common shares used to calculate
CSHPRQ	basic EPS
CSO	Common shares outstanding used to calculate Basic EPS
DE	Diluted earnings
DSO	Diluted shares outstanding used to calculate Diluted EPS
E/P	Earnings-to-price
EM	Earnings management
EPS	Earnings per share
ESOs	Employee Stock Options
FASB	Financial Accounting Standards Board
IASB	International Accounting Standards Committee
	Compustat item # for quarterly Net Income for Common
IBCOMQ	Shareholders
IBES	Institutional Brokers' Estimate System
M/B	Market-to-book
NASDAQ	
NYSE	New York Stock Exchange
P/E	Price-to-Earnings
PRCHQ	Compustat item # for Highest Share Price current quarter
PRCLQ	Compustat item # for Lowest Share Price current quarter
	Compustat item # for Purchase of Stock (cumulative per
PRSTKCY	quarter)
	Compustat item # for quarterly Redeemable preferred
PRSTKRQ	Stock (Capital)
PSTKQ	Compustat item # for quarterly Preferred Stock (Capital)
S&P	Standard & Poor
S0	shares outstanding at the beginning of the period
SFAS	Statement of Financial Accounting Standard
Si	Shares issued
Sre	Shares repurchased
w	Weighted average

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1 Introduction

1.1 Background

In the last two decades much research is done on stock repurchases. The most leading cause is that stock repurchases in general, and open market purchases in particular, become a more important tool for firms' finance decisions. The researches of Grullon and Ikenberry (2000) and Grullon and Michaely, (2002) present reasons and features for the increasing volume of stock repurchases. Later, Grullon and Michaely (2004) find more details about the information content of stock repurchases. Also the intent to boost EPS, and to meet or beat analysts' forecast become a more common phenomenon in the financial literature (Hribar et al., 2006).

Grullon and Michaely (2004) found that firms' outflow of cash through stock repurchases increased significantly, while the total amount of total expenditures to shareholders were stable. These expenditures include all payouts to shareholders such as bonus shares, dividends and stock repurchases. Thereby they suggest that the importance of stock repurchases will increase over time.

Managers repurchased over \$846 billion amount on stock repurchases during the five-year period ending in 2000 (Grullon and Michaely, 2002). Their sample was collected from Compustat and incorporates all available firms for computing the total dollar amount of repurchases. I further find 6,5 billion repurchased shares for a total amount of \$ 222 billion in the sample of US publicly-traded firms period from 2004-2006 (Bozanic, 2009). "Moreover, in 1999 and 2000, for the first time in history, industrial corporations in the U.S. spent more money on share purchases than they did on dividends" (Grullon and Michaely, 2004). But what are the motives for managers to repurchase stock?

Different parties have a different view on the question above. The general explanation of on-market stock repurchases, is the (potential) positive price reaction of stock. The explanation of financial economists is that managers can use repurchases as "a signaling device to convey information about firms' future prospects and/or undervaluation" (Vermaelen, 1984; Grullon and Ikenberry, 2000).

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Another explanation for repurchases is “the reduction of agency costs associated with firms’ excess free cash flow” (Grullon and Michaely, 2004). For example firms that repurchase their shares minimize the cashflow available for managers. When managers face a too high cash level (excess), opportunistic management can lead to over-investments (Jensen, 1986). The probability to repurchase stock also depends on the market conditions of firms (Bozanic, 2009). Industry competition will cause relatively low amounts of repurchases.

The financial press and sell-side analysts have another explanation for the presence of stock repurchases. They mention that stock repurchases occur because they are able to increase EPS (Hribar et al., 2006 and Bens et al., 2003). Bens et al. (2003) find the relations between stock repurchases and historical EPS growth and ESOs. Hribar et al. (2006) find that stock repurchases will be structured with the desire to meet or beat actual EPS with the analysts’ EPS forecasts.

Corporate chief financial officers (CFOs) share the same opinion as the financial press and sell-side analysts. When CFOs were asked for the reasons for repurchasing shares, most managers (75% of the survey-respondents) mentioned: “improving EPS numbers” (Brav et al., 2005 and Graham et al., 2005).

But how can managers increase the EPS by an open-market repurchase? The question cannot be answered easily. Although share repurchases increase EPS when they are well managed, it is also possible that they decrease EPS. The explanation can be found in the models of Hribar et al. (2006), where stock repurchases both influence the denominator (shares outstanding) and numerator (earnings). At last, it is important that stock repurchases taking place when firms face negative earnings are only able to decrease EPS.

In theory, CFO’s opinion about repurchases to improve EPS numbers will not always stand. When the decrease in earnings is higher than the decrease in shares outstanding, stock repurchases are not able to improve EPS by a penny or more. Moreover, Hribar et al. (2006) notify that stock repurchases that improve EPS number should be at least 1% of shares outstanding at the beginning of the quarter.

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Hribar et al. (2006) use firms' characteristics to compute the potential accretive effect of stock repurchases. The first and most important characteristic is the cash flow (CF) used to repurchase. With firms' cash flow there are lots of managerial opportunities to upward returns (called opportunity costs). Other characteristics is firms' industry code found by specific industry codes in Compustat (SIC).

The opportunity costs are gone when firms accomplish their stock repurchases. The opportunity costs can vary from returns on potential business investments to the purchase of government bonds. It is not possible to capture the opportunity costs for firms' potential business investments. That is why I assume that the opportunity costs of cash are equal to the foregone earnings from cash in government bond (according quarterly Treasury-bill rates). The selected approach to compute the firms' opportunity costs will be described in section 2.4.

Bens et al. (2003), Hribar et al. (2006) and Bozanic (2009) found that listed U.S. firms improve their EPS numbers by structuring repurchases. Firms that structure repurchase transaction to improve performance or do this for major amounts can apply earnings management.

The decrease of the numerator (earnings) is caused by the opportunity costs and the decrease in share outstanding by the number of shares repurchased. This means that intentional stock repurchases structural improve firms' performance. Opportunity costs result in foregone return on cash.

It is also important to discuss the effects on stock price when managers decide to repurchase stock. In financial literature there are two important explanations for a positive stock price effect, perception of undervaluation of firm value by capital market and meeting analysts' forecasts. Managers' incentive for meeting or beating analysts' forecast is to create credibility in capital market. Prior literature (Bartov et al., 2002; Kasznik and McNichols, 2002; Myers and Skinner, 2002; Skinner and Sloan, 2002) conclude "that investors reward firms that report consistent earnings growth, consistently meet analysts' forecasts, and avoid earnings disappointments".

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When firms' increase the performance by a repurchase the market discounts that part of the transaction. But the price penalty of the purchase is lower when the price penalty of missing the analysts' forecasts. In my opinion, these well managed stock repurchases reduce the stock-price penalties of disappointing actual (diluted) EPS.

In previous paragraphs become clear that the research of Hribar et al. (2006) developed an approach to investigate earnings management by repurchases. Hribar et al. (2006) limited his research by focusing on repurchases to meet or beat analysts' forecasts. This means that they were focused on stock repurchases that occur when firms' would have missed the consensus quarterly EPS forecasts without a repurchase. In this thesis, I investigate the following question:

'Are stock repurchases used as an earnings management device to meet or beat analysts' EPS forecasts?'

I want to replicate and extend the research of Hribar et al. (2006); "Stock repurchases as an earnings management device". Next section incorporates the research questions which are comparable with the questions of Hribar et al. (2006). By replicate and extend the research of Hribar et al. (2006) I hope to improve the knowledge about stock repurchases.

1.2 Relevance

Earnings management and stock repurchases in the U.S. have already been investigated by Bens et al. (2003) and Hribar et al. (2006). These studies were made for a research population before 2001. It can be useful to do research with the same models to explain trend or differences. Is there a trend traceable in the repurchase during the research period?

In this thesis I first investigate the trends in repurchases during the 13-year time period. Then, I will use the Hribar et al.'s improved proxy to classify repurchases into 'repurchases that increase EPS' and 'repurchases where EPS remain the same or decrease'. The time period of my research overlaps the research period of Hribar et al. (2006) for the years from 1997 to 2000. This means that the time period of my research is from 1997 to 2009, separated in two samples (1997-2003 and 2004-2009).

An important change for capital market is the credit crunch (2008-2009). The credit crunch influenced stock prices, Treasury bill-rates and investment opportunities. Moreover, the uncertain market can have influence on analysts' forecasts. Important indicator to approach pre-purchase EPS is the opportunity costs of excess cash. The Treasury bill-rates (appendix I) are very low compared with earlier years.

There are also amendments in regulation (rule 10b-18) for firms that repurchase stock. Thereby the information of stock repurchases in database of Wharton Research Data Service can be changed. Replicating and extending the research of Hribar et al. (2006) can be relevant for checking the influences on stock repurchases and the availability of stock repurchase information. Better data potentially lead to better estimates for the influence of stock repurchases to firms' performance.

The following questions can be reasonable to analyse after the research outcomes: What is the influence of stock repurchases on the share prices after the credit crunch? Do companies have enough cashflow available to repurchase stock after the credit crunch?

1.3 Research questions

Redoing and extending the research of Hribar et al. (2006) also means that my thesis has a similar base. The hypothesis will be therefore unchanged. The same hypothesis and research design will cause material evidence to compare different time periods and my result which those of Hribar et al. (2006). Before I can make any comparisons with the results of Hribar et al. (2006), I have to explain the research choices.

The assumptions, sample, and data of this master's thesis are in line with the research choices of Hribar et al.'s (2006). The model of Hribar is the guideline to find the number of stock repurchases that increase EPS (accretive stock repurchases).

Following Hribar et al. (2006), I divide the accretive stock² repurchase under quarterly pre-purchase forecast error bins. This is to find explanations for the magnitude of stock repurchases around different forecasts errors bins. The forecast error bins are estimated by the quarterly pre-purchase EPS minus the quarterly consensus analysts' EPS forecast. When the magnitude of stock repurchases is high by small negative forecast errors, earnings management can be considered. The question for this objective is described in text-box 1. When I answer this question I can conclude whether these structured repurchases are coincidence or driven by earnings management.

Text-box 1

Main questions:

1 Is the level of accretive stock repurchases disproportional high for firms with small negative pre-repurchase quarterly EPS forecast errors?

The hypothesis is from the research of Hribar et al. (2006)

² Accretive repurchases are repurchases that increase firms' EPS. An accretive repurchase occurs when pre-purchase EPS is lower than actual EPS. Pre-purchase EPS is actual EPS minus of the denominator and plus the numerator effects of a repurchase. The denominator-effect of the repurchase is decrease in the common shares outstanding used to calculate basic EPS and the numerator is the increase in earnings. Section 2.5 describes the proxy for computing the denominator and numerator effect.

1.4 Outline

In this thesis I will introduce stock repurchases, parameters for firms' performance and their connection in chapter 2. This chapter is called "firms' performance and repurchasing stock". Then, the relation of earnings management and stock repurchases will be described in Chapter 3. After that I will set out the relevant literature in Chapter 4. This chapter is called the 'literature review'. Chapter 5 ('Research design') will state my sample choices and important research variables. The empirical results will be tabulated and described in Chapter 6 "Empirical results". These empirical results (all tabulated) will be discussed and explained in Chapter 7. This chapter is called 'Data analyses'. In Chapter 8 I will write the conclusions of this master's thesis. Thereafter, I will give some recommendation for additional research in chapter 9. At last, the appendixes and references will present other relevant data that belongs to this master's thesis.

2 Firms' performance and repurchasing stock

In Chapter 2 I will pay attention to stock repurchases and firms' performance. These terms are highly connected according to prior research (Hribar et al., 2006; Graham et al., 2005; Brav et al., 2005; Bens et al., 2003). The connections of repurchases and firms' performance will be answered by the following questions: 'What are repurchases' and 'what does literature tell about it'? 'What are the methods and motives to repurchases stock in the U.S.'? How do economists (such as investors or analysts) measure firms' performance? How do you compute the EPS effects of stock repurchases?

This chapter will make clear how stock repurchases are connected with firms' performance. But first all relevant information about stock repurchases will be presented. Also the characteristics of firms' performance should be described. I come to the following classification in sections for Chapter 2;

1 Stock repurchases

This section gives an introduction of stock repurchases. This section includes information about the presence of stock repurchases in the United States (U.S.), the different ways to repurchase stock and finally the motives for managers to repurchase stock. This is important to explain the increasing number of stock repurchases.

2 Firms' performance

In the next section the relation between firms' performance and (basic and diluted) EPS will be drawn. The question for this section is: "which number(s) in the financial statements is (are) the most important for investors". These answers give the best ratios or numbers to measure firms' performance. Thereafter the influence of stock repurchases to firms' performance will be described. The conclusions of this section incorporates the relevance of firms' performance numbers that potentially affected by structured stock repurchases.

3 regulation concerning EPS calculation

After the introduction of EPS as an important performance indicator, the regulation for EPS calculation will be presented. This section illustrates the Accounting Standard Codification (ASC) 260. The ASC260 is the statutory law that guides the EPS calculation. This section is important to understand my proxy for the influence of repurchases to EPS (ASIF_EPS equations).

4 Opportunity costs of cashflow

Then, I describe the relation of stock repurchases to the EPS numerator. The influence of stock repurchases to the earnings for common (or diluted) shareholders is called 'the opportunity costs'. These opportunity costs are based on different assumptions that compute the foregone return on cash that was missed because of the repurchases. The proxy of Hribar et al. (2006) is described in this section.

5 Accretive/decretive effect of stock repurchases

After the approach to compute firms' opportunity costs, I will replicate and extend the models to obtain the effect of repurchases on actual EPS. For the effect of stock repurchases on actual EPS, Hribar et al. (2006) construct a model that measure the EPS in the absence of the stock repurchase (called pre-purchase EPS). The pre-purchase EPS ignores the reduction of shares outstanding (denominator) and increases the earnings with the opportunity costs (numerator) associated with firms' repurchases.

6 Capital market obtained analysts' EPS forecasts

This section presents the motives for managers to achieve analysts' EPS forecasts. The relevance of analysts' forecasts is important to explain the abnormal presence of stock repurchases around firms' pre-purchase earnings surprises that would have missed the analysts' forecasts (small negative bins).

7 Reaction of stock prices to earnings surprise announcements

This section presents the potential effects on share prices when firms would have missed the quarterly consensus analysts' EPS forecasts. Later, this section explains the stock price response by investors when repurchases are accomplished by firms.

8 Stock return opportunity of stock repurchases

The sequel to previous section is dedicated to findings of Hribar et al. (2006). They find that firms have a higher premium when firms only meet or beat the quarterly consensus analysts' EPS forecasts by stock repurchases compared with matched firms who missed the quarterly consensus analysts' EPS forecasts without doing a repurchase.

9 Regulation concerning stock repurchases

Section 2.9 gives information of the U.S. regulations to stock repurchases. The safe-harbor-rule and rule 10b-5 will be treated because the influence of this regulation is informative and give more insight in the behavior of managers.

10 Summary

The summary will give a short summary of answered questions in this Chapter.

2.1 Stock repurchases

2.1.1 Introduction of stock repurchases

Stock repurchases become more important in the business environment. Investors and analysts admit that repurchases can have impact on their valuation of equity. When firms repurchase stock, they buy shares back from their shareholders. These transactions cost money for the company. The uncertainty conditions (reasons, timing, pricing or volume) of a repurchase can influence investors' opinion on firm value.

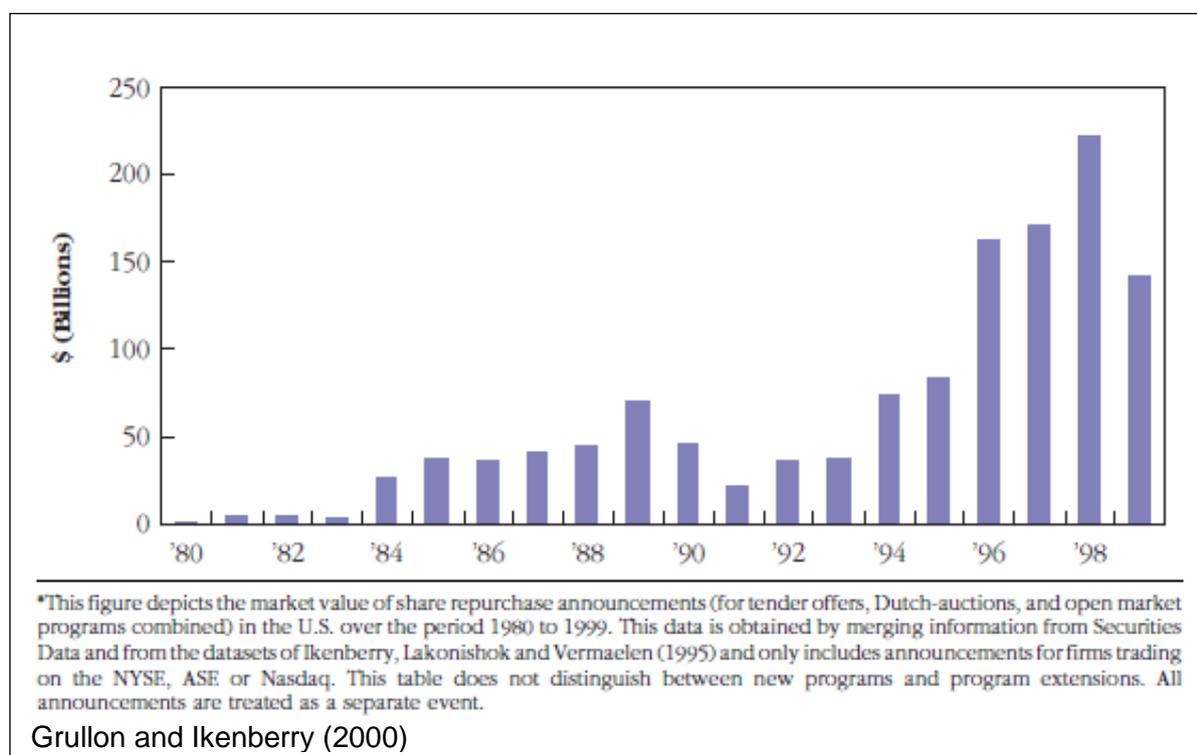
There are five ways for firms to repurchase stock (Vermaelen, 2005). In the underlying paragraphs I explain these ways.

The first option for managers to repurchase stock is an open-market repurchase. Managers repurchase the shares directly from sellers in the capital market. In this situation investors and analysts cannot directly see the repurchase transactions of the firm. These transactions will be disclosed in the financial statement after or during the quarterly period. Sellers of the shares are only aware of a published open-market repurchase program, not when these repurchases occur or who the buyer of their shares is. In this way firms can take advantage of invisible stock repurchases (Hribar et al., 2006). This makes open market stock repurchases a good tool to manipulate EPS.

Grullon and Ikenberry (2000) investigated to the phenomenon of stock repurchases. They find a significant increase in open-market repurchase programs. I will illustrate the market value of repurchase program by Figure 1.

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Figure 1 Amount (\$) of repurchase programs



This figure shows an immense increase of stock repurchases programs over time. Besides the increase of the repurchases programs, Grullon and Ikenberry (2000) find that from all U.S. repurchase programs almost 95% consist of open-market programs. Moreover, the time-line (the average is between 2 and 3 years) of open-market programs have important influence on the flexibility for managers. The increase of repurchase programs is supposed to stand for years after 1999.

Another interesting finding of Grullon and Ikenberry (2000) was the increasing percentage of S&P100 and S&P500 firms with flexible open-market repurchase programs. For now they expect that more firms in S&P 100 (or 500) will announce flexible open-market repurchase program. Moreover, these programs are not costly to establish, companies that do not purchase any stock face a negligible stock return penalty, and offers an opportunity to time the repurchases well. Firms with that time the repurchases can increase firm-value (Bozanic, 2009).

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The second way to repurchase stock is by a private acquisition. The repurchasing firms and the shareholder (who wants to sell his/her shares) need to have business contact about the repurchase price. These kinds of repurchases are not in public market, but are done internally (investor private with the firm). In this way the acquisition is temporally invisible for investors. This method is used when two parties do not want to disturb the market when selling or buying big amounts of shares. In most cases, the amount and size (change in common stock) of this repurchase will be high. Stock markets are highly sensitive for such repurchases.

The third method to repurchase is a tender offer or public bidding. By a tender offer repurchasing firms communicate a repurchase announcement to the public. Vermaelen (2005) states that “public fixed price tender offers include firms that offer to repurchase its shares from shareholders at a fixed price”. In this announcement it is important that firms notify a fixed price, a specific number of shares, and a target number of shares. The incentive for tender offers is that firms’ shareholders have the opportunity to sell their shares at a higher price than the market value. Also the firm can have an advantage when they repurchase stock (motives, subsection 2.1.2).

Vafeas et al. (2003) did research to identify the extent of earnings management preceding self-tender offers for a sample of U.S. firms. They find that the earnings before the repurchase are managed. Firms try to manage earnings down with the incentive that shareholders will sell their shares at lower prices”. After the repurchase they find higher than expected earnings caused by reversed effects of accruals management.

The fourth way for a repurchase is a Dutch-auction. “In a Dutch-auction (extended tender offer) firms set price bins for shareholders to sell their shares to the firm. Thus this way is a sort of public bidding. Shareholders set the price they are willing to sell their shares within the ranges stated by the firm. The firm then chose to buy the shares at the lowest price ranges.

The last method to repurchase own stock is with derivatives. Repurchase stock with derivatives is not a real business event. Vermaelen (2005) called it “synthetic repurchases”. The ways for repurchase stock by derivatives are “writing put options, buying collars and buying forward contracts” (Vermaelen, 2005). “The main difference with other buyback

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methods is that synthetic derivatives allow a company to take advantage of an undervalued stock price without using cash” (Vermaelen, 2005).

Hribar et al. (2004) state that U.S. firms only repurchase stock by a fixed-price tender offer, a Dutch-auction tender offer, or an open-market repurchases. This means that the outcomes of Grullon and Ikenberry (2000) suggests that the fixed-price tender offers and the Dutch-auction tender offers amounts approximately 5% of the total announced shares repurchase programs.

In the preceding paragraphs I mentioned the following repurchase options: private acquisition, tender offer, and public bidding (inclusive Dutch-auction). Because of the relative low cash outflow and the relative low number of shares by these types of repurchases (compared with total repurchases), the flexibility of open-market purchases will be the most important source for judging about an earnings management device (Grullon and Ikenberry, 2000).

2.1.2 Motives for stock repurchases

Why are managers repurchasing stock? It is important to know what the managerial motives of repurchasing shares are. In my research the motive of managers according Hribar et al. (2006) will be the most important.

Bettenhausen (2008) described five motives, which I treat in this subsection. The motives are from Badrinath et al. (2001), who discussed four motives for firms to set up a share repurchase program (Bettenhausen, 2008). Bettenhausen (2008) gives an extension for the repurchase programs motives by adding a motive mentioned by Bagwell (1991). This motive is called “fending off unwanted takeover attempts” (Bettenhausen, 2008). The extended repurchase-motives are:

- 1) increase of share price;
- 2) rationalize the firm’s capital structure;
- 3) substitute stock repurchases for cash dividend payouts;
- 4) deploy excess cash flow;
- 5) The last motive is “fending off unwanted takeover attempts”.

1 I assume that firms that improve performance by stock repurchases are rewarded by investors (Hribar et al. 2006, p. 24). This means that the share price is relative higher for firms that meet or beat analysts' forecasts with the repurchase than firms that missed the forecasts without the repurchase. But Bettenhausen (2008) also present the relation with the repurchase motives and increasing share price. This is explained by the literature of Vermaelen (1981) and Jagannathan and Stephens (2003). In these researches the share price permanently increases when firms repurchase stock. Vermaelen (1981) and Jagannathan and Stephens (2003) declare that firms' undervaluation have influence on stock prices.

2 Repurchasing stock has also influence on firms' capital structure. When firms repurchase their stock there are changes in firms' equity (and sometimes debts). Less equity and more or equal debt will increase firms' debt-equity ratio. Dittmar (2000) and Badrinath et al. (2001) find some evidence that companies repurchase stock with the intent to increase the debt-equity ratio to firms' optimal leverage level. Research of Grullon et al. (2004) improve the literature on firm's capital structure by finding that after a repurchase program the cost of capital for a firm decreases. When these firms repurchase stock and potentially improve their debt-equity ratio, providers of capital will see this as a positive sign and a decrease in risk and agency costs.

3 The third motive for managers can be a deliberate policy for some firms. The first reason for a change in payout policies is the tax treatment. Stock repurchases are not taxed and dividends are taxes as income for shareholders. Long-term shareholders do prefer postpone of dividend income to optimize tax advantages (Badrinath et al. 2001). The second reason for a change in dividend policies is the opportunity to spread cash outflow from financing to optimize firms' cash flow policies. Firms also might prefer repurchasing stock over dividend because structuring repurchases can optimize firms' performance (Bozanic, 2009; Hribar et al., 2006).

4 The fourth motive is the presence of excess cashflow. When firms have excess cash flow (proxy for excess cash flow in section 2.3) in combination with less business opportunities or uncertain market conditions, this excess cash can also be used for

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repurchases to mitigate future dividend outflow. Stephens and Weisbach (1998), Dittmar (2000) and Hribar et al. (2006) find that repurchases and the percentage of excess cash are positively related to probability of a repurchase.

Investors also see repurchases as signal that firms have less external investment opportunities. Repurchasing firms might prefer safer investments to decrease their business risk instead of uncertain external investments. On the other side, saturated industry where profit margins are low do not exploit their excess cashflow on stock repurchases (Bozanic, 2009).

5 At least there is the firms' motive to repurchase stock to prevent for acquirers. Bagwell (1991) finds that there is a motive to repurchase stock when managers want to fend off a takeover attempt. When repurchasing stock, usually the shareholders with the lowest valuation sell their stock first. This means that the remaining shareholders want to see more money for their shares. Takeovers can be unprofitable as the higher premium on shares exceeds the firm value for the acquiring firms (Bettenhausen, 2008). Bozanic (2009) finds there is a trend that firms "substitute repurchases for anti-takeover provisions".

Some alternative motives (rationalize the firm's capital structure and fending off unwanted takeover attempts) will only have significant influence when stock outstanding decreases significantly. In this perception these motives do not have any influence on my research. My research incorporates models which try to capture the repurchases that do not exceed 20% of the shares outstanding at the beginning of the quarter. These large amounts will be eliminated from the sample because they are not motivated by the increase of stock price or meeting or beating firms' EPS targets (see section 2.6 'analysts EPS forecast'). By the financial statements, the motivations for the remaining stock repurchases are hard to find.

The absence of these motives does not harm the research outcomes; because all shares from the repurchases that are counts below 20% of shares outstanding at the beginning of the quarter assumed to have short term effects on EPS and indirectly stock price. That is why I do not incorporate the motives in the research models.

2.2 Firms' performance

Firms usually inform interested investors by different ratios in external reporting. These ratios are used for evaluating the financial position of the firm. "Financial ratios can help investors in making investment decision and predicting firm's future performance" (Martani et al., 2009). EPS is the most common ratio for indicating firms' profitability. "It is an important ratio that is often used to get an impression of the performance of a firm" (Van Santen, 2004). This ratio is disclosed in external reports (Form 10K and Form 10Q) by basic and diluted EPS numbers. The performance of firms is also predicted by analysts as a signal for the capital market. An important prediction by analysts is the quarterly EPS forecast.

Bettenhausen (2008) states that the "users of financial information seem to base their decisions more on diluted EPS than on basic EPS, since diluted EPS has more explanatory power on stock prices than basic EPS (Jennings, 1997)".

Firms tend to manage repurchases to achieve EPS targets. When they succeed to meet or beat the quarterly consensus EPS forecasts with their actual EPS, they prevent themselves for a huge loss of firm value (Hribar et al., 2006; Skinner and Sloan, 2002). Other researches (Kasznik and McNichols, 2002; Myers and Skinner, 2002) apparently agree that meeting analysts forecast has influence on firm value. A survey of Graham et al. (2005) confirms the findings of Skinner and Sloan, and finds that "firms are willing to sacrifice economic value in order to meet a short-run earnings target".

Regulators have set strict rules about some financial ratios in financial statements, especially for EPS. Following US GAAP, the numerator and denominator should be calculated precisely according ASC 260 'Earning per share'.

A cooperation between the Financial Accounting Standards Board (FASB) and the International Accounting Standards Committee (IASB) leads to Statement of Financial Accounting Standard (SFAS) 128 (later restated into Accounting Standard Codification (ASC) 260. After a period of drafts to see what comments stakeholders had, the FASB published SFAS128 in 1996. These guidelines about EPS did not have structural differences, only small ones. In 2003 SFAS128 is adjusted by the FASB and the IASB to reduce some of the

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few differences that existed. In this way firm's profitability can easily compared with the industry or other firms. Regulators improve comparability of earnings by strict rules concerning the calculation of the EPS ratio.

2.3 Regulation concerning EPS calculation

EPS consists of two parts, the earnings (numerator) and shares outstanding (denominator). In financial literature and accounting standards a distinction is made between basic EPS and diluted EPS.

Diluted EPS is more relevant than basic EPS. Hribar et al. (2006) already use diluted earnings as the starting point to compute the pre-purchase EPS. This number will be compared with the diluted forecasts on IBES. But not all companies have diluted forecasts on IBES. When the diluted forecasts were unavailable, they used basic EPS forecast to compare with actual EPS (Hribar et al., 2006 p. 9). In the research of Hribar, near 80% of the observations contains forecasts of diluted EPS.

SFAS was responsible for the regulation about the calculation of EPS in ASC 260. This regulation is issued in February 1997. The harmonization with IFRS gave the key for the content of ASC 260. According to ASC 260, firms are obliged to mention both basic EPS and diluted EPS in the consolidated report. Basic EPS is calculated as basic earnings (BE) divided by weighted average common shares outstanding used to calculate basic EPS (CSO) during the period.

The BE (numerator) is the income available for common shareholders and calculated by net income minus dividend on preferred stock. When a loss occurs, the loss will be higher when preferred dividends are set. The net income is also corrected for all expenses, taxes, and the elimination of minority interests.

The CSO (denominator) is calculated by the sum of shares outstanding at the beginning of the period (S_0) and weighted average of the shares issued (ΔS_i) minus the weighted average shares repurchased (ΔS_{re}) during the period. The weighted effect of shares repurchased and shares issued depends on the time they are outstanding during the period. Activities that do not change the value of equity like issuance of bonus shares and stock splits also counts for computing the CSO.

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From this number the following equations appear:

$$\text{CSO} = \text{S0} + \Delta \text{Si} + \Delta \text{Sre}; \text{ and}$$

$$\text{Basic EPS for common shareholders} = \text{BE} / \text{CSO}$$

Diluted EPS is determined by complex calculations of BE to diluted earnings (DE) and CSO to diluted common shares outstanding (DSO). DE is the sum of BE and the diluted effect of conversions plus dividend on convertible preferred stock. For the diluted effect on earnings, ASC 260 describes basic earnings plus convertible preferred dividends, interest (after-tax) on convertible debt, and effect of assumed conversion of potential common shares.

DSO is computed by the sum of CSO and dilutive potential common shares. Under dilutive potential common shares³ ASC defines convertible obligations and preferred shareholders calculated back to shares by exercise prices. Finally the diluted EPS is computed as:

$$\text{DSO} = \text{DS0} + \Delta \text{Si} + \Delta \text{Sre}$$

$$\text{Diluted EPS} = \text{DE} / \text{DSO}$$

³ There is a limitation because in Compustat the increase of preferred dividends that are convertible and the increase of convertible obligation are not available or traceable.

2.4 Opportunity costs of cashflow

In the background I had already written about the importance of the opportunity costs. Opportunity costs are important for managerial decisions. But how do I estimate this opportunity costs? And how do the firms fund their repurchases?

The level of excess cash is the starting point for financing decisions. When firms are below the level of excess cash flow, they have to borrow money to do investments. The opposite is there when firms have cash above the level of excess cash. Then firms can use that cash to invest.

Firms do not report their level of excess cash in Form 10K and Form 10Q. Cash under the excess cash level is necessary to keep key business processes running effectively. For my research it is important to assess the excess cash level for firms to compute their opportunity costs. My excess cash level proxy comes from Koller et al. (2005), who revised the book of Copeland, Koller and Murrin (2000). Koller et al. (2005) investigates to the liquidity of the non-financial S&P 500 companies in the time period from 1993 to 2000. Their conclusion was that the minimum cash balance is approximately 2 percent of sales. This proxy should be seen as statistic data and not as a rule. For firms that have too low sales, 2 percent of assets is the proxy for excess cash.

The appropriate liquidity depends on the nature of the business and the volatility of cash flows (higher volatility leads to higher required cash balance). When costumers pay by cash in a store, firms always have more cash presented in the financial statement. Especially for retail firms the excess cash level will be higher. Also Hribar et al. (2006) gives retail firms a different treatment for setting a proxy for excess cash flow. Retail firms face excess cashflow when the cash balances are above 6% of total assets.

The proxy for excess cash flow is a conservative estimate for the opportunity costs. In my research the beginning of cash as a percentage of sales will be used to estimate whether firms have to borrow cash or use their excess cash to repurchase shares.

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When free cash flow is used for the repurchase, the quarterly Treasury-bill⁴ rate will be used to estimate the opportunity costs. When firms borrow cash flow, company's borrowing rate will be used as the estimate for the opportunity costs. The companies' borrowing rate is assumed to be the treasury-bill rate plus 1%. Because company's borrowing rate is dependent on market conditions. The Treasury bill-rates come from the Federal Reserve statistical releases and U.S. Department of Treasury. More information over historical Treasury bill-rates and the way how this is measured can be found in appendix I.

Earnings from financing will be taxed and when a firm repurchases, these earnings from financing will be lower. Thereby this part of the earnings will not be taxed. When firms create more debts it increase the total cost of debt. As a result the pre-purchase earnings will be lower by the foregone income on cashflow used for the repurchase. The foregone pre-purchase interest income is not been taxed. In this way all opportunity costs of excess cash or cost of debt will be multiplied by the $1 - (\text{statutory tax rate})$ to compute the pre-purchase earnings.

The effect of taxes is also important for estimating the opportunity costs. It is possible to uses the estimated corporate marginal taxes by the method of Graham's (1996). He focuses on how best to measure the corporate marginal tax rate, which is an important input into financial analysis of the cost of capital, financing policy, corporate hedging, and corporate reorganizations. I believe that taxes on financing income could not be influenced by corporate tax structure. That why I use the quarterly statutory tax rates to estimate the effects of taxes. Historical statutory tax rate is disclosed in the appendix (V).

Finally the time weighted effect of the repurchase is important for foregone quarterly earnings (opportunity costs). The method to compute the foregone interest income interest (opportunity costs) will be computed as:

⁴ "Treasury bills are short-term government securities with maturities ranging from a few days to 52 weeks. Bills are sold at a discount from their face value" (Treasury direct, 2010)

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Text-box 2

$$C_t = 1 - \text{STR} (\text{CF_Repurch} (t) \times \text{FBR} (t) \text{ or } \text{TBR} (t) \times w)$$

Where C_t is the foregone interest income, CF_Repurch is cash used for the repurchase. FBR is firms' borrowing rate and TBR is the Treasury bill-rate. STR is the statutory tax rate and is presented in appendix IV. Then w is the time-weighted effect of the repurchased. At last, t is the year of the CF_Repurch .

Hribar et al. (2006)

The opportunity costs calculated by the equation above is also called foregone return. The foregone return will be used in the literature of Hribar et al. (2006) and Bens et al. (2003) as the variable C_t . I assume that the earnings available to common shareholders plus the foregone return will be the pre-purchase earnings. Following Hribar et al. (2006) repurchases has influence on the numerator of EPS.

2.5 The accretive/decretive effect of stock repurchases

Stock repurchases can lead to better EPS performance of firms. Many stock repurchases could mitigate the negative stock price-effect of disappointing EPS (Bens et al., 2003; Hribar et al., 2006). In this section I present conditions and assumptions to compute the accretive/decretive component of stock repurchases.

First it is necessary to illustrate the EPS before and after the repurchase. When I compare the outcomes of the pre-purchase and actual EPS, I can judge whether a repurchase is accretive or decretive. To compute the pre-purchase earning I reconstruct the basic and diluted EPS calculation according section 2.3.

In the previous section I already gave the numerator effect of a repurchase on the pre-purchase EPS. But stock repurchases also have influence on the denominator (shares outstanding). When the outflow of resources has a lower effect on earnings (opportunity costs) than the mitigating effect of a purchase on the denominator (weighted average of shares), the repurchase will be EPS accretive.

When I eliminate the repurchase effect the following formulas incorporate the pre-purchase earnings effect. First equation is designed to reflect the pre-repurchase EPS (EPS₀):

Text-box 3

$$EPS_0 = BE/CSO \text{ and } EPS'_0 = (BE + Ct) / (CSO - w\Delta Sre)$$

Where EPS'₀ (EPS₀) is the pre-purchase EPS (post-purchases or actual EPS). Then, BE is the periodic earnings for shareholders and Ct is the foregone return on cash that a firm missed when they repurchase stock. In this equation, CSO is common shares outstanding used to calculate basic EPS and ΔSre is the number of shares repurchased. At last, w is the transaction timing 'weight'. This weight transaction timing is used to calculate the impact of the repurchased shares to common shares used to calculate basic EPS for that quarter. Values for the timing parameter (w) range is set at three different levels, namely 0.75, 0.5 and 0,25. When the timing parameter equals 1, the repurchase occurs at the beginning of that quarter and for repurchases that occur at the start of the period to 0 for those that occur at the end of the period. Hribar et al. (2006)

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The equation above can also be interpreted from the pre-purchase earnings to the actual earnings. Then the pre-purchase EPS minus the foregone return shared by CSO plus the weighted average of shares repurchased will be the equation for (basic) actual earnings.

In the paragraphs above has become clear that accretive repurchases depend on the relation between opportunity costs and the inverse price-to-earnings ratio (nominator effect). This means that repurchases are EPS accretive when the inverse price to earnings ratio at the time of the repurchase is greater than the foregone return on cash used for repurchases (Hribar et al., 2006). The following formula (text-box 4) reflects the conditions for an accretive repurchase.

Text-box 4

$$\begin{aligned}
 & \text{EPS}'_0 > \text{EPS}_0 \quad \text{or} \quad (\text{BE} + \text{C}_t) / (\text{CSO} + w\Delta\text{Sre}) > \text{EPS}_0 \\
 & (\text{BE} + \text{C}_t) / (\text{CSO} + w\Delta\text{Sre}) > \text{EPS}_0 \quad (\text{CSO} + w\Delta\text{Sre}) / (\text{CSO} + w\Delta\text{Sre}) \\
 & \text{EPS}_0 \frac{w\Delta\text{Sre}}{(\text{CSO} + w\Delta\text{Sre})} > \frac{\text{C}_t}{(\text{CSO} + w\Delta\text{Sre})}, \quad \text{where } \text{C}_t = w\Delta\text{SrePr} \\
 & \left(\frac{\text{EPS}_0}{P} \right) \frac{w\Delta\text{Sre}}{(\text{CSO} + w\Delta\text{Sre})} > \frac{w\Delta\text{Sre}}{(\text{CSO} + w\Delta\text{Sre})} r \\
 & \left(\frac{\text{EPS}_0}{P} \right) > r.
 \end{aligned}$$

EPS₀ is pre-buyback EPS and EPS'₀ is the post-buyback EPS. Further is BE the periodic earnings for common shareholders, C_t is the foregone return on cash used for a repurchase, CSO is the common shares outstanding used to calculate basic EPS, ΔSre the number of shares repurchased, and w the transaction timing “weight” used to calculate the weighted-average shares outstanding for the period. The values for the timing parameter (w) range from 1 for repurchases that occurs at the start of the period to 0 for those that occurs at the end of the period. Suppose that shares are repurchased at a price P per share using cash that was previously earnings an after-tax return r per period. The foregone return on cash used for repurchases is C_t = w (Δ SreePr). For price I use the quarterly average of the lowest value and the highest value of shares during the quarter. (Hribar et al., 2006) adjusted by my insight.

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Following Hribar et al. (2006), I will give an example for the expression of an accretive stock repurchase according the formula above. If firms' interest income of excess cash after taxes ((1 - corporate tax rate) multiplied by Treasury bill-rate) is 2,5%, and the P/E ratio of the repurchase is lower than 40, the stock repurchase will be accretive. When a repurchase occurs at any higher P/E, the repurchase will reduce actual EPS of this firm. Then the opportunity costs of the repurchase will outweigh the reduction in shares outstanding.

In this thesis, the accretive stock repurchases is defined as a repurchase that increases quarterly EPS by at least \$0,01. The outcomes of the proxy are rounded to the nearest penny (Hribar et al., 2006).

For computing the pre-purchase EPS, I follow the models of Hribar et al. (2006), called ASIF_EPS1 and ASIF_EPS2. These models are described in the research design. By these models I can judge about the accretive/decretive effects stock repurchases. Actual EPS minus pre-purchase EPS is the proxy.

2.6 Capital Market obtained analysts' EPS forecasts

In the background (section 1.1) of this master thesis analysts' consensus quarterly EPS forecast pass through. The analysts' forecasts are collected from the IBES database. The forecasts in the database have various forms. There are EPS forecast available for the next quarter until the fourth future quarter. The question is "why are analysts' consensus EPS forecasts an important parameter for actual EPS"? The answer to this question is described in the book of Palepu et al. (2007). Analysts conduct fundamental analyses of accounting information and try to find inside information for companies. From their function in capital markets, they have to inform investors about firms' performance.

Analysts' forecasts are a form of prospective analysis to give stakeholders information about future performance. Forecasting has different stages and includes inside information, firms' economic situation, market circumstances, etc. Palepu et al. (2007) use business strategy, accounting and financial analysis to come to a sufficient forecast. Empirical research proves the relevance of analysts' forecasts for managers. Graham et al. (2005) find that managers believe that meeting benchmarks (analysts' consensus EPS forecast) builds credibility with the capital market, and that meeting benchmark is important for management's external reputation. In this perspective analysts' forecasts are short-term leading variables for accretive stock repurchases.

Moreover, forecasts announced before the beginning of the quarter, are the first indications for managers to evaluate the future actual EPS. The stock market reacts on analysts' forecasts. That why firms tend to prevent a miss of analysts' EPS forecast by repurchase stock. In this master's thesis I call this 'meet or beat analysts' forecasts'. When the pre-purchase actual EPS tends to come under the quarterly consensus forecasts, repurchases can prevent a huge loss of firm value. Managers have superior information in the development of actual EPS according to the information asymmetry (Rajan and Saouma, 2006, page 1). In this way manager can use actual performance to predict the need of a repurchase to meet or beat analysts' forecasts. The quarterly pre-purchase EPS minus the

consensus analysts' quarterly EPS forecasts is an important indicator for managers' decision to purchase stock.

2.7 Reaction of stock prices to earnings surprise announcements

Investors also react on stock repurchases. Prior research (Hribar et al., 2006 and DeFond and Park, 2001) already found that investors discount the increase of earnings that is managed. In this case the accretive component is (for a part) discounted by the market.

Hribar et al. (2006) mentioned that investors detect stock repurchases in the financial statements. They calculate the operating and the repurchased component separately from the earnings surprise. The response in stock returns will therefore reflect the combined implications of the actual EPS. This response in stock returns is based on the influence of future firm performance. Moreover, investors have to predict stock repurchases by prior repurchases and signal the presence of open-market repurchase announcements. In practise investors' estimated probability and amount for repurchase is uncertain and varies.

When the market signal repurchases, they are priced differently because the market look to true performance. When a repurchase is intended to boost EPS the share price will be higher discounted than repurchases that seems unrelated to improve EPS numbers (Hribar et al., 2006 page 7). Examples of repurchases that are unrelated to boost EPS are managerial signalling of undervaluation, reducing the agency costs and deploy of the excess cash flow. Sometimes it is impossible for firms to boost their actual EPS at a similar level as the consensus EPS analysts' forecasts. Firms that already face high negative forecast errors or high positive forecast errors are unable to meet or beat analysts' forecast by stock repurchases. That is why these firms are unrelated to earnings management.

Hribar et al. (2006) investigates the explanatory variables for response of stock price for a sample of all firms and a sample of firms that are suspected to apply earnings management.

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They expected that the component of stock repurchases in earnings surprises at the earnings announcement date for the whole sample will face less negative stock returns than the component of the earnings surprise of the sample that is suspected to apply earnings management. This means that firms that would have missed the analysts' consensus EPS forecasts without a repurchase affect more negative response in stock price" (Hribar et al., 2006).

2.8 Stock return opportunities of stock repurchases

In the sections 2.5 to 2.7, I discuss accretive stock repurchases, analysts' forecasts, and the investors' discount of the repurchase component. In this section the effects of a stock repurchase on firms' stock returns will be discussed.

If investors perfectly discount the repurchase component of actual EPS, there will be no possibility to increase share price. When this situation is reality, applying earnings management for increasing share price is impossible. In Hribar et al. (2006) there is evidence that investors' discount the repurchased component of the earnings surprise. But why have managers the intent to repurchase stock when analysts' quarterly EPS forecasts would fall without a purchase?

The findings of Hribar et al. (2006) give an explanation on the question in the previous section. They find asymmetric average stock returns at the earnings announcement date for a matched sample of non-repurchase firms and repurchase firms. The indicator repurchase incorporates firms that would have missed the quarterly analyst forecasts. There was a huge difference in stock return response between the two samples. There also was a difference in absolute stock return between the highest and lowest market-to-book quintile (M/B quintile). This is related to the price-earnings ratio that is connected with the market-to-book quintile.

The outcome Hribar et al. (2006) suggest "that in the highest and lowest M/B quintile stock repurchases with the incentive to meet or beat analysts' EPS forecasts will mitigate some of the share price penalty associated with missing the forecasts". The benefits for firms when they prevent the miss of the forecasts vary in and lowest M/B quintile. The highest benefits are for the firms with the highest M/B quintile, the lowest benefits for the lowest M/B quintile. Skinner and Sloan (2002), already find also an asymmetric share price response across market to book quintiles for non-repurchase firms that miss the consensus EPS forecast.

The theoretical explanation for the asymmetric stock return is that investors reward firms for meeting analysts' forecasts. The missed analysts' EPS forecasts will afford a large share price penalty. Thus, firms face a valuation premium when they (constantly) meet or beat

analysts' EPS forecasts (Skinner and Sloan, 2002; Bartov et al., 2002; and Kasznik and McNichols, 2002).

2.9 Regulations concerning stock repurchases in the U.S.

Before firms do open-market stock repurchases, firms have to announce open-market repurchase programs to the public. The repurchase announcement is not prohibited in the U.S. but it will protect firms against legal liability (Section 10(b) and Rule 10b-5). Section 10(b) and Rule 10b-5 prevent firms for material misstatements not viewed as manipulative trading according Rule 10b-18. In Rule 10b-5, the subject is more related to the information to the public and insider trading.

Firms announce a repurchase-program before they actually repurchasing shares. In this way they give material information to the public. Material information under the Federal Security laws is "the substantial likelihood that a reasonable shareholder would consider it important in making an investment decision". Firms that do not disclose the purchase programs face potential legal proceedings. That's why managers with the incentive to repurchase stock first have to the repurchase program in a press-release.

Press releases can vary from very detailed forms to press-releases that include less information. In press-releases, the following information can be disclosed (Dorsey & Whitney LLP, 2002):

- Number of shares outstanding
- Number of shares planned to repurchase
- The total dollar limit of the purchase
- Who is responsible for the repurchases and which officers are going to repurchase the stock
- Financing method for the repurchase
- Arrangement with some person to repurchase it/his/her shares
- The period of the stock repurchases
- Purposes of the repurchases
- Statements that the safe-harbor rule will be respected

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An extension of the rule 10b-5 is set by the SEC in 2000. This rule (10b5-1) was a result of constantly abuse of rule 10b-18. Rule 10b5-1 can be detrimental for firms when the government proves that the entity or person is guilty on an unethical act. In this context an unethical act could be described as “the awareness of material nonpublic information at the time of the repurchase” (Dorsey & Whitney LLP, 2002). Firms document the repurchase announcement plans well and capable for preventing legal liability. This legal liability is also applicable when firms do not comply with the Safe-Harbor rule (rule 10b-18). The firm Dorsey & Whitney stated that “This Safe-Harbor rule (rule 10b-18) should be exercised with great care by repurchasing firms” in 2002).

The repurchase announcement plans often incorporate no limit on the duration or size of the program. “This makes this type of repurchase very flexible for firms and not transparent to investors, since the repurchases can only be derived from the financial statements by looking at shares outstanding” (Hribar et al. 2006).

Because of the fact that firms could abuse their flexibility to repurchase; the SEC adopted the rule 10b- 18 in November 1982. This rule applies to trading activities of the firm, not on disclosure or amount of stock repurchased, etc. It was the first rule that provides any law and protection to repurchase processes for investors. Although this rule is not statutory law, “it sufficiently reduced litigation uncertainty to allow the surge in stock repurchases activities” (Grullon and Ikenberry, 2000). The SEC rule includes the following topics:

- one broker or dealer per day

All the repurchases of firms have to be made by one broker or dealer (per day). Because of the complexity of complying with Rule 10b-18, repurchasing firms can make prior arrangements to complete their market repurchase program. They can contract one broker or dealer that has enough experience to accomplish the demand of the repurchasing firm.

- timing of the repurchase

For the securities that are traded on national exchange or the Nasdaq National Market, there are restrictions for repurchases. The repurchases may not occur in the day’s opening

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transactions for the security and are prohibited during the last half hour of scheduled trading on the exchange.

- price of repurchase

Repurchase securities, which are traded on AMEX, NYSE, or Nasdaq National Market, are forbidden to exceed above the current independent bid quotation or the last independent sale price of the security. These repurchases also exceed the lowest current independent offer quotation reported. The 'purchase price' of securities excludes commissions and any commission equivalent, mark-up or differential paid to a dealer.

- volume of repurchases

Following the Rule 10b-18, NYSE, AMEX and (national market) NASDAQ firms are prohibited to repurchase more than 25% of the average daily trading volume of the security per day. This average daily trading volume is based on the average of four calendar weeks before the purchase. "Block purchases' (as defined in the rule) and private transactions not effected through a broker or dealer are not required to be included in computing the 25% daily volume limitation".

"Complying with the Rule 10b-18 conditions requires an issuer to identify all its affiliated purchasers and coordinate all their open market bids and purchases with its own. The conditions of Rule 10b-18 are complex, and the rule itself, rather than these summaries, should be consulted for technical compliance".

As mentioned by Bozanic (2009) the SEC's "safe harbor" provisions do not have the right effect on stock repurchase decisions of managers. By this statement he stated that "firms are relatively immune from allegations of market manipulation so long as repurchases are carried out under the SEC's guidelines". Cook et al. (1999) already found that less than 10% of the programs followed the full regulation on stock repurchases (rule 10b-18).

As a result of these problems a new rule by the SEC, requires firms to disclose their repurchases on a monthly basis in 10-Q and 10-K disclosures. This amendment was Regulation S-K (viz., 17 CFR §229.703) and was effective on 17th December, 2003.

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Hribar et al. (2006) mentioned that firms disclose repurchases different. Some of the firms describe the complete repurchase (number of shares and amount spend) and others describe less information about repurchases in their 10-Q filings or firms' quarterly earnings releases. Through the amendment of rule 10b-18 (Regulation S-K, viz., 17 CFR §229.703) the quarterly earnings releases will give more detailed information of stock repurchases (see appendix IV).

The only statutory law for repurchases is described in ASC 230 "Cash flow statements" (SFAS 95). The topic of this law is cash flow statement and requires a clear insight in cash flow. Stock repurchases are important financing tools and have to be disclosed in the financial statements. The cash outflows, caused by repurchases, have to be disclosed in the cashflow for financing (CFF) to give a good inside in company's financing decisions. The limitation of ASC 230 is that the indicating cashflow is sum of different finance decision⁵.

2.10 Summary

Stock repurchases are familiar in the financial landscape of firms'. Managers repurchase stock for billions of dollars a year to provide firms objectives. The content of stock repurchases is obvious: when stock repurchases occur both firms' shares outstanding and firms' earnings decrease.

The decrease of shares outstanding provides opportunities to improve EPS numbers or influence cost of capital by a reduction of risk. The decrease of cash balances influences the firms' finance decisions on core businesses when the amount of cash is below the proxy of excess cashflow. Then, firms have to borrow money to accomplish the repurchase. Firms that face excess cashflow to repurchase their shares affect the finance decisions according to opportunity costs.

There are different choices to repurchase stock. The most important repurchases in the U.S. are the fixed-price tender offers, the Dutch-auction tender offers, and the open-market repurchases. The total amount and number of repurchases exist for approximate 95% of open market repurchases (Grullon and Ikenberry, 2000).

⁵ In the appendix VI the variables of item 'Purchase of stock' will be presented.

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The connection of stock repurchases and firms' performance is found by prior research (Hribar et al., 2006; Brav et al., 2005; Graham et al., 2005; Bens et al., 2003). Structuring repurchases can improve firms' performance (Hribar et al., 2006 and Bens et al., 2003). Managers do even use repurchases in financing decision to manage their short-term objectives (Brav et al., 2005 and Graham et al., 2005). The objective of managers is to influence firms' EPS numbers. More specific, firms want to improve dilutive EPS numbers because these numbers are the most important for investors.

The analysts' forecasts are important objectives for managers to meet or beat because investors reward firms that constantly meet or beat analysts' forecasts with quarterly actual EPS (Kasznik and McNichols, 2002).

On the other side, missing the forecasts lead to a high loss of firms value (Skinner and Sloan, 2002 and Bartov et al., 2002). Bartov et al. (2002) research also found that meeting the forecasts by earnings management (accrual management) lead to higher valuation of firms than missing the forecasts without earnings management.

Similar is the research of Hribar et al. (2006) that find the same outcomes for meeting analysts' EPS number by stock repurchases. Hribar et al. (2006) found that stock repurchases with the incentive to improve EPS numbers are discounted by the market but when firm miss their forecasts the negative stock return response is higher than this discount.

3 Earnings management and stock repurchases

In this chapter, earnings management (EM) will be discussed. EM and stock repurchases have a connection (Hribar et al., 2006 and Bens et al., 2003). What is EM? Which are the motives for EM? How to measure EM for stock repurchases?

I come to the following classification in sections for Chapter 3;

- 3.1) Earnings management
- 3.2) Motivations for earnings management
- 3.3) Measurement
- 3.4) Summary

3.1 Earnings management

Surveys in the US (Graham et al., 2005) and the UK (Choi et al., 2006) find that improving EPS numbers is important for managers. Other literature shows that meeting analyst expectations is a fundamental earnings target (Athanasakou et al., 2009). And at least Hribar et al. (2006) who find that stock repurchases increases EPS numbers when they are well managed.

The following definition of EM is used by Healy and Wahlen (1999):

“EM occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers”.

In this sentence, I find the words ‘structuring transactions’ which could be linked to the flexibility of open-market repurchases. Managers can mislead investors by repurchases that increase firms’ performance. This increase is shown in firms’ performance indicators (basic

EPS and diluted EPS). These variables can change when firms manage their repurchases well.

In my research I focus on EM by stock repurchases. The abnormal presence of accretive stock repurchases when firms face (small) negative pre-purchase earnings surprises and the abnormal absence of decreative stock repurchases when firms face (small) positive pre-purchase earnings surprises, will be seen as an abnormal phenomenon in this thesis. When this in no co-incidence it will be seen as earnings management.

3.2 Motivations for earnings management

There are many reasons for firms to manage earnings. Healy and Wahlen (1999) distinguish three motivations for firms to apply earnings management: capital market, contracting and regulatory motivations.

The capital market motivation means that managers take advantage of the diversity of accounting information by stakeholders and financial analysts. This information also leads to the valuation of stock. Stock prices are an important incentive for managers to manipulate earnings. "Managers then act in the assumption that managing earnings (or EPS) will have influence on the short-term stock price performance" (Healy and Wahlen, 1999).

Earlier studies (Burgstahler and Eames, 1998; Richardson et al., 2001; Kasznik and McNichols, 2002; Myers and Skinner, 2002; Skinner and Sloan, 2002; Hribar et al., 2006 and Athanasakou et al., 2009) find evidence of earnings management for stock market purposes. Most of these researches perform evidence that firms manage earnings to meet or beat analysts' forecasts increases firm value or prevent huge losses in firm value. These researches also have influence on the short-term stock price performance.

Contracting motivations are motivations used to help monitor and regulate contracts between the firm and its stakeholders. In some circumstances earnings management is necessary to meet some obligations with stakeholders. The accounting information has to be confirming the obligations. Healy and Wahlen (1999) made distinction between lending contracts and

management compensation contracts. For example, changes in accounting methods were examined by Healy and Palepu (1990) to find earnings management where firms barely exceed lending covenants. Their conclusions were that firms “that would exceed lending covenants manage their earnings”.

The earnings management literature distinguishes two types of regulatory motivations: “industry-specific regulation and anti-trust regulation” (Healy and Wahlen, 1999). Industry-regulation dedicated on some industries that face specific regulation on accounting. Industries that face industry-regulation are for example banking, insurance and utility industries (Healy and Wahlen, 1999). Anti-trust and other regulations mean that managers have other incentives to manage earnings.

3.3 Measurement of earnings management

In most earnings management studies, EM will be measured by accrual models. By accruals models, the firms will be compared with industry or trends. Most accrual models compare firms' cash flow statements and the earnings. There are a lot of these accrual models developed to detect EM (e.g. Jones, 1991; DeFond and Jiambalvo, 1994). This literature is mainly focused on the EPS denominator and the strategic use of accrual manipulation (e.g., Jones, 1991).

In most of these models a distinction is made between non-discretionary and discretionary accruals. Only the discretionary accruals can be influenced by management. The non-discretionary accruals could not be directly influenced by management. Accrual management have influence on both income statement and balance sheet. In my research I do not use accrual models because they do not give me information about firm's behaviour of meeting to analysts' forecasts. In this way earnings management has to be proven for only affecting EPS numbers by stock repurchases.

To detect earnings management related to stock repurchases and its meeting and beating forecasts behavior, the relative frequency of repurchases on a small positive and negative

earnings surprises are decisive. The most accurate method for this research is the model of Hribar et al. (2006). This model is from Hribar et al. (2006) and differs from most other earnings management studies. Hribar et al. (2006) counts changes in both numerator and denominator. In the literature review the measurements will be explained more intensely.

3.4 Summary

Earnings management can be interpreted as the way to improve firms' performance or balance sheet by structuring firm's transactions or decisions. When managers use their expertise "to mislead stakeholders about the underlying economic performance of the firm", they apply earnings management. Earnings management is a broad topic and includes stock repurchases, meeting debt covenants, accrual management, etc. In this thesis, only stock repurchases will be important.

The reason why earnings management occurs is mentioned by managerial incentives. Managers can have three different reasons to use earnings management as a tool to improve financial statements. Capital market, contracting and regulatory motivations are found by Healy and Wahlen (1999) as managerial motivations for earnings management.

How earnings managements affects firms' performance depends on the method used by the managers. By accrual management, managers affect both income statement and balance sheet. Meanwhile, earnings management by structuring stock repurchases to improve EPS numbers only have influence on EPS numbers.

In this thesis the method of Hribar et al. (2006) will be used to do research to the topic "stock repurchases as an earnings management device". Their research has a model (treated in section 2.5) where companies stock repurchases have both influence on the numerator and denominator.

4 Literature review

Important for my research design are prior research outcomes. This chapter will point out the relevance of prior research on stock repurchases and give a summary. In the last ten years, there were a lot of scientific articles written about the phenomenon stock repurchases. This is because stock repurchases become an important tool in financing decisions. To expose the most important literature, I make distinctions in the treated literature in this thesis.

The most important researches are the published editions (final paper and working paper) of Hribar et al., (2006) and Hribar et al., 2004. Then Bens et al. (2003) is important because this research was the foundation of Hribar et al's model for computing whether stock repurchases were accretive or decreative. The articles of Lacker (2003) and Guay (2002) are also important to explain the differences between the research choices of Hribar et al. (2006) and Bens et al. (2003). These articles will be summarized in section 4.1 "Stock repurchases to meet or beat EPS purposes".

Thereafter, I will focus on literature which gives more information about the relation between stock repurchases and the managerial behavior to improve EPS numbers. This topic is important for my research, because this will connect stock repurchases with earnings management. Managers' decision to improve EPS by stock repurchases can be seen as an earnings management device. In this section I describe articles of Graham et al. (2005) and Brav et al. (2005). All the summaries of these researches can be found in section 4.2 "Managerial behavior and stock repurchases".

Section 4.3 ('Earnings and analysts forecasts') includes the literature of Athanasakou et al. (2009), Hribar et al. (2006), Richardson et al. (2001), Kasznik and McNichols (2002), Myers and Skinner (2002), and Skinner and Sloan (2002). This section is dedicated to the intent to lead actual EPS to the analysts' EPS forecasts. This section also incorporates influence of meeting the forecasts on the stock price response. At least it implies the stock price response for firms that miss the EPS analysts' forecast by their actual EPS.

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The next section gives more details about prior research to the phenomenon stock repurchases. This section incorporates the literature of Grullon and Ikenberry (2000), Grullon and Michaely (2002), and Grullon and Michaely (2004). These articles are presented in section 4.4 “phenomenon stock repurchases”. Also the thesis of Bettenhausen will be described in this section.

The timing of stock repurchases is also an important research topic for stock repurchases. That is why in section 4.5 the articles of Bozanic (2009) and Hamon (2003) will be described.

Then in section 4.6, I give the summary of researches that react on investors response on stock repurchases. These articles are from DeFond and Park (2001), Bartov et al., (2002) and Hribar et al (2006).

At last in section 4.7, all other relevant articles and books theses are presented. This section includes for example Copeland et al. (2000), Chan et al. (2006), and Balachandran et al. (2007).

4.1 Stock repurchases to meet or beat EPS purposes

4.1.1 Introduction

In this section I describe “stock repurchases to meet or beat EPS purposes”. This topic gives new insights in the topic of earnings management. Prior research on earnings management gives only the influence of managerial decisions on the numerator of EPS (earnings).

The first research which investigates the EPS meeting purposes was Bens et al. 2003. They find that managers “increase the level of their firms’ stock repurchases when earnings are below the level required to achieve the desired rate of EPS growth”. Bens et al. (2003) already draw the conditions under which stock repurchases are accretive.

Guay states that Bens et al. (2003) do not include the effect of repurchasing stock as the increasing payout policy. He also doubts that repurchases really mitigate the diluted effect of employee stock options (ESOs). Lacker (2003) argued that “the short-term effects of analysts’ forecasts are more important for managers than historical EPS growth”. Hribar et al. (2006) adopt the model of accretive stock repurchases and did expand the comments of Lacker (2003) and Guay (2003).

Hribar et al. (2006) build their research on Bens et al. (2003). They try to find evidence of managerial behavior to meet or beat analysts’ EPS benchmarks with stock repurchases. In the coming sections I will give more details on these researches.

4.1.2 Hribar et al. (2006)

Hribar et al. (2006) investigate the usage stock repurchases to meet or beat analysts’ EPS forecasts. Hribar et al. (2006) include all U.S. firms listed on the NYSE, AMEX or NASDAQ. Their research sample spans a 13 years-timeline from 1988 to 2001. From this sample they exclude transactions occurring before the effective date of SFAS95 (now called ASC 230).

Stock repurchases as an earnings management device

Hribar et al. (2006) eliminate the items shown in the table 4 from the sample:

Table 1

1) utilities, financial institutions, and transportation firms
2) stock repurchases on the quarterly cash flow statement lower than \$10,000
3) repurchases where more than 20% of the firm's outstanding common stock is repurchased
4) firms that do not have financial statements available on CRSP, IBES, and Compustat

Hribar et al. (2006) conclude that firms manage stock repurchases to avoid missing analysts' EPS forecasts. This is underpinned by the abnormal high observations of accretive stock repurchases around pre-purchase earnings surprise bins where accretive stock repurchases can improve actual EPS to the desired level of analysts' EPS forecasts.

4.1.3 Bens et al. (2003)

Bens et al. (2002) argues that firms are concerned about EPS dilution. They assume that fear of EPS dilution is the reason why management prefers to repurchase stock instead of issuing share when employee stock options are exercised.

The sample of Bens et al. (2003) exists of 357 firms classified as S&P 500 industrial firms. Bens et al. (2003) make the sample selection decision by the presence of firms' ESOs. The research period was from 1996 to 1999. Detailed ESO data in disclosure was first required from 1996. The FASB described the full requirements in ASC 718 (SFAS 123).

All detailed ESO data of firms were necessary to accomplish the research. ESOs required for the research were hand-collected from annual report. They also collect annual stock repurchases from the annual report. Their final sample consists of 1072 observations.

They find that "the dilutive effect of employee stock option (ESO) plans on diluted EPS helps explain executives' stock repurchase decisions. They also find that executives are more likely to undertake repurchases when earnings fall short of the levels necessary to sustain prior growth rates in reported EPS. In addition, they find that the dilutive effect of ESOs on

repurchases is stronger for firms with high P/E ratios, presumably because the financial reporting benefits of meeting EPS targets are larger for these firms”.

4.2 Managerial behaviour and stock repurchases

Graham et al. (2005) surveys managers to capture their driving factors in the decision-making process for reported earnings. They send emails to more than 3000 managers in high functions⁶. These managers are employed by firms listed on NASDAQ, AMEX, NYSE and some private firms. The survey was conducted in 2003.

The final sample incorporates more than 400 executives and is distributed for different analyses. The conclusions useful for my research is the conclusion that managers are intended to sacrifice long-term value to smooth earnings and managers’ opinion of meeting the forecasts. Graham et al. (2005) find in the survey outcomes that “78% of the managers will sacrifice firms’ long-term value to smooth the earnings (EPS numbers)”. They also find that “managers believe that meeting benchmarks (analysts’ consensus EPS forecast) builds credibility with the capital market, and that meeting benchmark is important for management’s external reputation”.

“Then, there is the research of Brav et al. (2005), who replicate and extend prior research to dividend policies for the 21th century. They try to determine how managers (CEOs, CFOs, and Treasurers) think about recent payout decisions. These payout decisions include both dividend and repurchase policies. The research is built on surveys and in-depth interviews. The sample includes 384 financial managers and 23 in-depth interviews.

I found some interesting survey outcomes for my thesis, namely that “more than 75% of survey respondents indicate that increasing earnings per share (EPS) is an important factor affecting their share repurchase decisions” (Brav et al., 2005). They also find that “many interviewees express great concern about the effects of repurchases on EPS” (Brav et al.,

⁶ “Chief financial officer, Chief Accounting Officer, Treasurer, Assistant Treasurer, Controller, Assistant Controller, or Vice President (VP), Senior VP or Executive VP of Finance” (Graham et al., 2005)

2005). This indicates that many managers submit a link between stock repurchase and firm performance.

4.3 Earnings and analysts' forecasts

In my thesis I do research on stock repurchases to meet or beat analysts forecast. But there is also literature with a different perspective to meet analysts forecast. This research is done by Athanasakou, Strong and Walker (2009). Athanasakou et al. (2009) investigated earnings management by "meeting or beating analysts' forecasts through forecasts guidance". They did research on UK listed firms (available in DataStream) for a period that spans 7 years (1994-2002). They also exclude financial institution from their sample.

They try to explain meeting or beating analysts' forecast by accruals management, earnings classification shifting or earnings forecast guidance. They use accrual models (discretionary accruals) and a self-made proxy.

Athanasakou et al. (2009) conclude that managers are able to influence the forecasts of analysts. In this way they can achieve the analysts' forecasts. They also conclude that "UK firms are more likely to engage in earnings forecast guidance or in classification shifting rather than in accruals management to avoid earnings surprises" (Athanasakou et al., 2009).

Richardson, Teoh, and Wysocki (2001) investigate management's role in beating analysts' forecasts. They search for the role of Equity Issuance and Insider Trading Incentives. They suggest that firms and analysts are working together in an "earnings-guidance game".

They divide the forecasts in twelve monthly ranges and analyze if the vision of analysts is changed during the year(s). The data for this research is obtained from I/B/E/S individual analysts forecasts of annual earnings for U.S. firms. The time period of the research is from 1983 to 1998. After implementing the research, Richardson et al. (2001) conclude that management can influence the forecasts of analysts through discretionary information. The most striking finding is that, "during the 1990's, analysts issue systematically optimistic forecasts early in the fiscal year followed by systematically pessimistic forecasts as the earnings announcement approaches" (Richardson et al., 2001). They also find evidence that

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“managers opportunistically guide analysts' expectations around earnings announcements to facilitate favorable insider trades after earnings announcements”.

After the articles of Athanasakou et al. (2009), Hribar et al. (2006), and Richardson et al. (2001) the questions could rise ‘what the stock return response is when firms missing or achieving analysts' EPS forecasts’? The articles of Skinner and Sloan (2002), Kasznik and McNichols (2002) and Bartov et al. (2002) are devoted to this question.

Skinner and Sloan (2002) did research on earnings surprise, growth expectations, and stock returns. They also mentioned the sentence “don't let an earnings torpedo sink your portfolio”. They selected a sample from all firms that have data available on IBES and CRSP from 1984 till 1996. This sample results in 103,274 quarterly earnings observations. In their research they compare all firm quarterly actual earnings with forecasts. The results were divided into indicator variables. From the indicator variables, the data were bundled with stock price responses. This event study concludes firms are likely to announce negative earnings surprise as positive earnings surprise (with applying earnings management), because of the negative influence on stock price. They also find asymmetric results in market-to-book quintiles.

The second research that investigates the influence of meet or beat analysts' forecasts on firms' stock price, is the research of Kasznik and McNichols (2002). Their research investigates “whether the market rewards firms meeting current period earnings expectations” (Kasznik and McNichols, 2002). Their sample incorporates all firms from 1986-1993. The data of all firms are prohibited to be available in the 1996 Compustat Merged Database. The data they need are the forecasts one year before and two years ahead on IBES.

Their approach is related to the stock price response when firms constantly meet the forecasts. They make proxies which contains the indicator MEET to all forecasts. Then they compare all the stock responses of these selections. Kasznik and McNichols (2002) find that “abnormal annual returns are significantly greater for firms meeting expectations”. They also find “that the market assigns a higher value to firms that meet expectations consistently, controlling for an estimate of the firm's fundamental value”.

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Bartov et al. (2002) did another research to earnings expectations. They try to find the market response of unexpected earnings, when firms apply earnings management to meet or beat earnings expectations and when firms meet or beat earnings expectations without earnings management. They have a sample nearly 130,000 quarterly earnings forecasts from 65,000 firm-quarters. This sample includes the years from 1983 to 1997 and covering approximately 65,000 firm-quarters. Firms' data have to be available on Thomas/First Call (I/B/E/S) database (analysts' forecasts) and the CRSP database (stock prices). In this research they conclude that matched pair firms⁷ which meet or beat current analysts' earnings expectations are rewarded by a higher return over the quarter than firms that miss these earnings expectations". They also find that this higher return is significantly lower, when firms applying earnings management. The most important finding of Bartov et al. (2002) is that firms face the highest negative stock return when they do not apply earnings management and missed their forecasts.

4.4 The phenomenon stock repurchases

This section refers to researches which improve overall information of stock repurchases. These studies were important for the knowledge of stock repurchases.

The research of Grullon and Ikenberry (2000) is a literature review. The period they collect information spans from 1980 to 1999. In this research I found a lot of useful information of repurchases. I found for example information about:

- 1) Regulatory issues that face stock repurchases
- 2) Absolute amounts of stock repurchases
- 3) Motives for stock repurchases
- 4) Trend in repurchase announcements
- 5) The influence of stock repurchases to capital market
- 6) Theory of Vermaelen (1984) "signalling of undervaluation firm value"

The research of Vermaelen (2005) was also useful for my research. Vermaelen (2005) states the different ways to repurchase stock. They disclose and explain five ways to repurchase

⁷ Firms with similar quarterly earnings forecast errors.

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stock (see section 2.1.1 of this master's thesis). In prior literature, authors describe four ways to repurchase stock. But in recent years the opportunities to repurchase stock with derivatives become possible.

Then, this section presents the article of Grullon and Roni Michaely (2004). They did research to the information content of repurchase programs. They try to find explanations for stock repurchases, by making a model with the capital expenditures, R&D expenses and cash reserves. Then they define the CAR³, and make a multiple regression of systematic risk and future profitability. The sample includes all open-market share repurchase programs. The sample comes finally to 4,443 open-market share repurchase announcements for the period of 1980 to 1997. Grullon and Michaely (2004) conclude that "repurchasing firms have relative a higher reduction in systematic risk and cost of capital than non-repurchasing firms". They also find a more positive market reaction by firms that are predicted to have too opportunistic investments and announce a stock repurchases program. At last they find an indication that investors do not price repurchase announcements well. The basis for not adequately valuate the repurchase announcement is the undervaluation of the decline in firms' cost of capital.

Finally I used the master thesis of Bettenhausen (2008) for some information about stock repurchases. Bettenhausen (2008) investigates the topic "Managing Earnings per share through stock repurchases". He replicates the approach of Bens et al. (2003) to a European sample. This sample includes listed firms on the AEX, CAC40 and FTSE100. All 161 firms listed on those indices on January 1st 2008 were selected. Following Bens et al. (2003) he excludes utilities, financial institutions and transportation firms.

He concludes that firms' stock repurchases are guided by the diluted EPS growth rate. Firms try to achieve these diluted EPS growth rates by managing their repurchases. When firms probably missing their EPS targets, Bettenhausen finds managed stock repurchases to increase diluted EPS. These repurchases are in an attempt to reach the EPS targets. At least he finds different benefits and incentives to repurchase stock for firms with high and low market-to-book ratios. He states that through this fact, firms with high market-to-book ratios "are more likely to use share repurchases" (Bettenhausen, 2008).

⁸

Cumulative size-adjusted abnormal returns for three days selected days.

4.5 Timing of stock repurchases

The safe-harbour law (rule 10b-18) treated in section 2.9 is not always respected by firms. Cook et al. (1999) find that less “than 10% of the programs followed the absolute letter of each provision in rule 10b-18” (Grullon and Ikenberry, 2000). This rule does not belong to the statutory laws, but is made to protect investors for disadvantages by strategic repurchases.

Ginglinger and Hamon (2003) found similar illegal repurchases under French firms. They find that firms exceeded the maximum percentage capital allowed for repurchases, based on a dataset of transaction prices, volumes, and the best limits of the order book. The final sample includes 36,848 repurchases made by 352 French firms over the period 2000-2002. They stated that “very few firms fully comply with the regulations for all their stock repurchases”.

Hribar et al. (2006) mentioned the strategic timing of open-market before. But the research of Bozanic (2009) gives extra information. He first investigates the managerial motivations of repurchases and then the timing of open market share repurchases. He did this with three regression analyses for a sample of public firms with open market stock repurchases. The research period spans from 2004 to 2006. The final sample incorporates 1,047 firms with in total 7,188 monthly repurchases events. This paper finds evidence that managers adequate time their repurchases. The repurchases are done when they perceived undervaluation and there is presence of discretionary cash flow”. Also interesting for our research is the conclusion that “firms attempt to manage earnings upward through the use of repurchases”. Other findings are that “firms in competitive industries tend to repurchase less” and “firms tend to substitute repurchases for anti-takeover provision adoption” (Bozanic, 2009).

4.6 Investors' response on stock repurchases

Hribar et al. (2006) did also search for the investors' reaction on the component of earnings surprises caused by a stock repurchase. The repurchase-induced component of earnings surprises appears when stock repurchases are accretive or decreative. In section 2.5, the effects of stock repurchases on EPS are explained. They perform a multiple-regression analysis to discover the stock return response on different variables.

Hribar et al. (2006) concludes from this regression that investors "separately price the earnings surprise related to stock repurchases". This multiple-regression is expanded by a variable "Beat with a repurchase" and selected stock repurchases intended to apply earnings management (by improve EPS number to the desired level of analysts' forecasts). With this variable the negative stock price response is higher.

DeFond and Park (2001) did research to investors' stock return response on earnings surprise when abnormal accruals occur. They use an accrual measure that includes a proxy for the difference of realized working capital and expected working capital. The sample includes 14,389 observations. The earnings announcements observations are collected from firm-quarters. The sample spans a time period from 1992 to 1995. Their data is obtained from the First Call Historical Data (IBES) database. Their finding report that from the total magnitude of earnings surprises, abnormal accrual are differently priced. My prediction is that earnings management is discounted by the market. The market discounts the magnitude of abnormal accruals separately from the total earnings surprise.

4.7 Other relevant articles

In this section other topic that relates stock repurchase with earnings management will be treated. Balachandran, Chalmers and Haman (2007) examine earnings management for repurchasing firms with exercisable option holdings. The study tries to discover that accrual management in the pre-repurchase period. The accruals from 2 years prior to 1 year post the buyback announcement year are used for this study. They thought that firms apply accrual management to increase share price. The sample includes 445 ASX on-market buybacks

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during the period of 1996 to 2003 (excluding financial services, energy or utility industries). Accrual management was measured by a cross-sectional modified Jones model. Balachandran, Chalmers and Haman (2007) find “that repurchasing firms with exercisable options have higher current discretionary accruals than repurchasing firms with no exercisable options, unexercised options or with out-of-the-money options. The results indicate that repurchasing firms with exercisable options apply earnings management and repurchase announcements to maximize option payoffs”.

Another topic in earnings management is the stock price reaction when firms announce repurchase programs. From various literature I suggest that repurchase announcements have a positive reaction on share prices. Chan, Ikenberry, Lee and Wang (2007) did research to this phenomenon. Chan et al. (2007) illustrate circumstances under which managers can decide to announce a repurchase programs to boost stock price for a short term. Managers who face too low stock prices and stand under high pressure can take advantage of stock repurchase announcements to boost stock-price. Important to know is that these announcement could only boost stock price for a short-term (Chan et al., 2006). The sample includes all firms listed on the NYSE/AMEX/NASDAQ stock Exchange from 1980 till 1990. The findings of Chan et al. (2007) were clear: “the market react positively to the announcement of open market share repurchases”. They also predict that these circumstances could lead to manipulate stock price by managers.

The research of Koller et al. (2005) is the last important part of the literature study. They do research to valuation of companies (extended version of Copeland et al. (2000)). An important part of this topic is the determination of excess cashflow (Koller et al., 2005, p. 171). They also disclose a proxy for excess cash. This proxy comes from a statistical computation of firm data. The firm-data is from S&P 500 non-financial companies in the time period of 1993 to 2000. They examined the cash holdings of the sample and took the smallest cash balances as the proxy for excess cash. Thereby cash balances above 2 percent of sales, will be considered as excess cash. Whether this is a good proxy, depends on the industry of firms. Industries with payments in cash, such as retail firms, need a higher level for excess cash. Also firms with high volatility of cashflows need a higher amount of cash on the balance sheet.

4.8 Summary

From the literature review it becomes clear that Hribar et al. (2006) is the most relevant research to build my research design on. When I rebuild their research, it is necessary to have the same sample selection. Then the outcomes of Hribar et al. (2006) can be compared with outcomes of my time period. Before I do make this comparison, I have to know whether my research have the similar outcomes as Hribar et al. (2006) in an overlapping time period.

Bens et al. (2003) is not important for my research. Their research only investigates the relation of stock repurchases and earnings management when firms face ESOs, while my research include also firms that do not have ESOs. Bens et al. (2003) is meanwhile the foundation of the measurement whether stock repurchases improve EPS numbers. This approach is later replicated and extended by Hribar et al. (2006).

Other literature in this literature review only underpins the research choices. For example the literature treated in section 4.2 (Brav et al., 2005 and Graham et al., 2005), present information that managers tend to use their repurchases to improve firms' EPS numbers. They survey American executives in the same research period as in my sample.

Then, section 4.3 incorporates EM literature that investigates the relation of EM with analysts' forecasts. In this section become clear that various researchers conclude that analysts' forecasts are a relevant EPS benchmark for managers.

Thereafter, section 4.4 gives this thesis more information about the stock repurchases. A lot of this knowledge is described in section 2.1 of this master's thesis. In section 4.5 the literature about timing of stock repurchases is summarized. The structured timing of repurchases, which is a conclusion in Bozanic (2009), predicts earnings management through stock repurchases by management. Also the illegal acts of managers (Cook et al., 1999; Ginglinger and Hamon, 2003) suggests that managers) attach more value to structured repurchases than to the safe-harbor rule (rule 10b-18 only for America see section 2.9).

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Section 4.6 includes literature that show investors' response to stock repurchases. This literature concludes that earnings management to meet or beat desired EPS is recognized and negatively priced. The negative response in share price is on the other hand lower than the negative response in share price when firms fail to meet their desired EPS.

Finally, section 4.7 gives more information about stock repurchase literature. Chan et al. (2007) conclude that there was a significant positive stock return response when firms announce an open-market buyback program. This has also influence on this thesis. Also Balachandran et al. (2006) give insight in accrual around the announcement date of an open-market buyback program. At last this literature review contains literature of Koller et al. (2005) that provides an important proxy to estimate the excess cash flow level of firms.

5 Research design

5.1 Sample selection

My sample consists of U.S. Firms listed on the NYSE, AMEX or NASDAQ and spans for a period that from 1997 to 2009. The Stock Exchange Codes for the research are 11 (NYSE), 12 (AMEX) and 14 (NASDAQ). The observations by firms contain only quarterly data. For some models and data I need yearly information but convert it where necessary to quarterly information. I use firm-quarters because this data is earlier signals stock repurchases. Moreover, it is easier to compute the influences on opportunity costs and EPS.

I will make a distinction between the time period of 1997 to 2003 and the period of 2004 to 2009. The reason for the two research periods is to make comparisons over time and with Hribar et al. (2006). Moreover, more detailed data on stock repurchases become available in the second research period. This data includes more accurate information of stock repurchases because of the amendments in one SEC-regulation (appendix IV).

Since 2004, the new SEC-rule 10b -18 amendments also increase the availability of data on stock repurchases in Compustat. The two sample periods provide opportunities to compare research outcomes before and after the new SEC-rules. With these different time periods I also overlap one sample with Hribar et al.'s (2006) research period. This is easier to compare the outcomes.

Following Hribar et al. (2006), I will exclude banks, transportation companies, and utilities. These sectors face regulatory restrictions according Hribar et al. (2006). Moreover, utilities do not have quarterly amounts of repurchases available in Compustat. In both samples I exclude all firms that operate in the General Industry Codes (GIC) 20, 55 and 20(30). From GIC-sector 20, I need to eliminate the GIC Sub Industry Code 30. The first sample holds in a total sample of 6,496 firms with in total 96,798 quarterly observations. The second sample holds a total sample of 6,156 firms with in total 105,037 quarterly observations. The distribution of the selection from Compustat is disclosed in the tables 2 and 3.

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Table 2 Distribution firm-quarters sample 1 under General Industry Codes

		sample 1			
distribution General Industry Codes (GIC)	code	firms	percentage	observations	percentage
Transportation firms	2030	171	2%	3007	2%
Financial institutions	40	2318	24%	39510	26%
Utilities	55	506	5%	10643	7%
others	10-30, 45-50 and >55	6496	68%	96798	65%
Total	0-100	9491	100%	149958	100%

Table 3 Distribution firm-quarters sample 1 under General Industry Codes

		sample 2			
distribution General Industry Codes (GIC)	code	firms	percentage	observations	percentage
Transportation firms	2030	164	2%	2799	2%
Financial institutions	40	2365	26%	40742	26%
Utilities	55	458	5%	6979	4%
others	10-30, 45-50 and >55	6156	67%	105037	68%
Total	0-100	9143	100%	155557	100%

The firms in tables 2 and 3 have to include the following criteria in order to be included in my sample. First firms need actual stock prices available on the Centre for Research in Security Price (CRSP) database. Second they need to have quarterly consensus EPS forecasts available on IBES.

The most important variables for my research are the amount of stock repurchases and the number of shares repurchased. This information is available in the Compustat research files.

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Following the models of Hribar et al. (2006) I estimate the amount of stock repurchases⁹ and the number of shares¹⁰ repurchased for the two research sample as follows:

Text-box 5

For my first sample:

The dollar amount of common stock repurchased during (1997-2003) is computed as purchase of stock (PRSTKCY) per quarter minus the decrease in preferred stock (PSTKQ) or decrease in redeemable preferred stock (PSTKRQ). The dollar amount of common stock repurchased is also called CF_Repurch in this master's thesis.

The number of shares repurchased is computed as CF_Repurch dividend by the estimated average share price. The average repurchase price is estimated by the highest and lowest share price (PRCHQ and (PRCLQ)). I estimate the average repurchase prices as: $(2 \times \text{lowest share price} + 1 \times \text{highest share price}) / 3$.

For my second sample:

The dollar amount of common stock repurchased during (1997-2003) is computed as purchase of stock (PRSTKCY) par quarter minus the decrease in preferred stock (PSTKQ) or decrease in redeemable preferred stock (PSTKRQ).

The number of shares repurchased is taken from a Compustat variable 'total of shares repurchased' (CSHOPQ). By absence I estimate the number of shares repurchased as CF_Repurch dividend by the estimated average repurchase price. Followigng Hribar et al. (2006)

In the second sample I use the new information from Compustat research files. I suggest that this information is more accurate. Totally there are 4.854 firms (19,11%) of the total repurchase firms that do not have number of shares repurchased (CSHOPQ) when they repurchase stock.

⁹ As mentioned in prior literature (Hribar et al., 2006 and Stephens and Weisbach, 1998), the purchase of stock (PRSTKCY) overestimates stock repurchases. The ASC 230 "cash flow statement" does not prohibit a split off of 'purchase of stock' information. The 'purchase of stock' item incorporate different items, which all have their influence on the total amount of the purchase of stock (see appendix VI of this master's thesis).

¹⁰ The estimate by the average closing share price is not consistent with the finding of Bozanic (2009) and Cook et al. (1999). Bozanic (2009) finds that firms use transaction timing of repurchases to improve EPS, and Cook et al. (1999) find that less than 10% of the programs followed the absolute letter of each provision in rule 10b-18. Rule 10b controls the presence of abnormal high repurchases on a trading day (for example when the transaction timing is optimal for an EPS increase). Therefore, I will take the conclusions of Bozanic into my research model. The repurchase price per share will be estimated as $(2 \times \text{lowest value} + 1 \times \text{the highest value of current quarter})$. In section, I will test the influence of this choice with a robustness test.

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It is also important to know how the consensus analysts' forecasts are established. Following Hribar et al. (2006), I separate IBES data based on basic and fully diluted EPS by a description in the database. The variable description of the two possibilities can be found in the identifying data on IBES (Primary/Diluted Indicator (P/D)).

The results of the P/D indicator for my research samples indicate that almost all analysts provide diluted quarterly forecasts for firms. The total observations of the IBES identifiers are 20,047 P/D indicators. The distribution of fully diluted IBES consensus analysts' forecasts in the whole sample is 89% of total sample against 11% of basic EPS. Moreover, they always provide diluted quarterly EPS forecasts when firms face diluted EPS effects. When there is a dilution factor higher than 1, there are only consensus analysts' forecasts on diluted EPS. That is why I will use the diluted factor¹¹ as the indicator variable to judge whether analysts' forecast are primary or diluted based. In this way I can compute the right earnings surprises and pre-purchase forecast errors.

In my sample I will eliminate stock repurchases in their quarterly cash flow statement that are below \$10.000. The minimum amount for repurchases is adopted because all repurchases lower than \$10.000 do not have any influence on EPS in either accretive or decreative way. When these repurchases will be part of the research sample they affect accretive repurchases as a percentage of number total repurchases. In the first sample (1997-2003) there are 801 observations that are below \$10.000. The second sample (2004-2009) I found 1386 firm-quarters that have repurchases below \$10.000.

Stock repurchases that exceed 20% of the shares outstanding at the beginning of the quarter are a serious threat to my research outcomes (see subsection 2.1.2). Firms with too large repurchases ensure for outliers in the distribution of accretive/decreative repurchases. Activities like stock splits are also eliminated by the research sample. The first sample includes 242 firm-quarters that are higher than 20% of beginning shares outstanding. Sample two includes 162 firm-quarters that are higher than 20% of beginning shares outstanding. In both samples these transactions are eliminated from the sample. The relative frequency of firm-quarters where the number of repurchased shares exceed 20% of shares outstanding at the beginning of the quarter are in both sample below 1% (relatively 0,9% for sample one

¹¹ Calculate as the ratio (diluted EPS – basic EPS)/ basic EPS

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and 0,6% for sample 2. These transactions are most of times not open-market repurchases (because they prohibited by rule 10b-19 treated in section 2.9). Moreover, the incentive of these repurchases is different from meeting or beating EPS numbers.

Finally the selection process for the first sample (1997-2003) results to a sample of 96.798 firm-quarters. This sample includes 26.311 firm-quarters with stock repurchases. The second sample selection (2004-2009) the final sample incorporates 105.037 firm-quarters, and consist 23.910 firm-quarters with stock repurchases.

Table 4 Relation of total firm-quarters with firm-quarters with repurchases observations

	observations	repurchases	percentage
sample 1	96798	26311	27,18%
sample 2	105037	23910	22,76%
	201835	50221	24,88%

Thereafter, I collected the quarterly consensus analysts' EPS forecasts by the firm observations with stock repurchases from IBES. This selection results into 16.685 consensus analysts' EPS forecasts for the first sample and 18.679 consensus analysts' forecast for the second sample (see table 5). These quarterly consensus analysts' EPS forecast will lead to the distribution of repurchases divided in quarterly pre-purchase forecast error bins.

Table 5 Percentage of repurchasing firm-quarters with analysts' forecast available on IBES

repurchases	observations	consensus forecasts	percentage
sample 1	26311	16685	63,41%
sample 2	25598	18679	72,97%
	51909	35364	68,13%

5.2 Hypotheses

The sample selection becomes clear in previous section. In this section I want to describe the hypotheses of this thesis. After the hypotheses, the methods to examine the hypotheses follow. The formulas for these methods are from Hribar et al. (2006).

I devote attention to the opportunity costs of the cash outflow caused by stock repurchases. Thereafter I use the opportunity costs for as a variable in the formula to compute the effect of repurchases to EPS. Because stock repurchase are assumed to influence both the numerator and denominator.

To examine how stock repurchases influence EPS, I need some models which predict the pre-purchase EPS. Following Hribar et al. (2006), there are two methods for computing the influence of the repurchases. The first method ignores the earnings effect of repurchases. The second method assumes that firms have lower earnings when they repurchase stock. With the ASIF_EPS equations I will compute the pre-purchase EPS. The method to compute pre-purchase EPS without (with) the numerator effect (Ct) of the repurchase is described in text-box 6 (text-box 7). I also the approach of dividing the pre-purchase EPS (outcomes of the second method) to forecast error bins in this section.

Ct is estimated by excess cash level, the treasury-bill rate and the weighted average of the repurchase. The time-weighted effect of the opportunity costs is 0,5, the same as the assumptions in as-if EPS equations 1 and 2. In this perspective the subjective time estimate is important to calculate a good indicator for pre-repurchase EPS. I will describe a robustness test in section 5.4. Impleting the Ct results into the equation in text-box 8.

When I have computed the pre-repurchase EPS, I will compare the outcomes of the quarters with the quarterly actual EPS. When the actual basic (or diluted) EPS is higher (more than \$0,01) than the pre- repurchase basic or diluted EPS, the repurchase is accretive.

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Text-box 6 ASIF_EPS1

$ASIF_EPS1 = NI(t) / \text{Common Shares used to calculate Basic EPS} + 0,5 \times \text{Shares repurchased}(t)$,

Where NI is the reported earnings available to common shareholders for the fiscal quarter (IBCOMQ), and common shares used to calculate basic EPS (CSHPRQ) are the weighted shares for basic EPS. The repurchased shares are the numbers of shares that are repurchased during the quarter and conducted from the results presented in text-box 5. Finally (t) is the quarter of the repurchase.

Hribar et al. (2006)

Text-box 7 ASIF_EPS2

$ASIF_EPS2 = NI(t) / \text{Common Shares used to calculate Basic EPS} + 0,5 \times \text{Shares repurchased}(t)$,

The variables of this equation are founded the same as ASIF_EPS1 (see text-box 7). Only C_t deviates from ASIF_EPS1. This variable implies the opportunity costs of the cash outflow caused by the repurchase. The cashflow of the repurchase is conducted from the results of the estimates described in text-box 5.

Hribar et al. (2006)

Text-box 8 Opportunity costs

$C_t = 1 - STR (CF_Repurch(t) \times FBR(t) \text{ or } TBR(t) \times w)$

Where C_t is the foregone interest income, $CF_Repurch$ is cash used for the repurchase. FBR is firms borrowing rate and is computed as Treasury bill-rate + 1%. TBR is the Treasury bill-rate and is conducted from the Federal Reserves Statistical Releases (see appendix I). STR is the statutory tax rate and is presented in appendix IV. Then w is the time-weighted effect of the repurchased and is assumed to be 0,5. For firms that have a cash level higher than 2% of sales at the beginning of the quarter use the TBR as the rate for computing the C_t , and firms that are below the 2% I use the TBR plus 1%. SIC-codes between 5000 and 5999 are treated different because these are retail firms. By these firms I assume that the excess cash level is 5% of sales.

Hribar et al. (2006)

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The accretive stock repurchases calculated in hypotheses 1 do not have any purpose yet. Hribar et al. (2006) finds that these repurchases are an earnings management device to meet or beat analysts' EPS forecasts. I want to redo this test to stock repurchases. Therefore I have to compute the forecast error which can be found by pre-purchase EPS minus the consensus (first call) analysts' EPS forecasts of the firm-quarter¹². The consensus EPS forecast is the average of all EPS forecast in the quarter. The consensus forecasts calculated from forecasts during 30 days of the quarter.

I suggest that when there are negative forecast errors, which become positive when managers decide to repurchase stock (accretive repurchase), managers like repurchasing stock. On the other hand, firms that face small positive forecasts errors, which become negative when managers decide to repurchase stock, managers avoid repurchasing stock. Thereby I will state hypotheses H1A and H1B as:

Text-box 9 Hypotheses

H1A. : The level of accretive repurchases is disproportionately high for firms with small negative pre-repurchase quarterly EPS forecast errors.

H1B: The level of EPS decreasing repurchases is disproportionately low for firms with small positive pre-repurchase forecast errors.

Hribar et al. (2006)

The outcomes of testing these hypotheses have to lead to conclusions about the abnormal high proportion of accretive/decretive repurchase around negative pre-purchase earnings surprises.

Then, I will make forty-one pieces of earnings surprises range from -20 cents per share to a +20 cent for the two samples (1997-2003 and 2004-2009). In this bins I will show the accretive stock repurchases as a percentage of total ban-population. The outcomes has to explain the phenomenon of disproportionally numbers of accretive stock repurchases and when pre- stock repurchases forecast errors are negative. I will do the same tests for the phenomenon of decretive repurchases around the pre-purchase forecast errors.

¹² Hribar et al. (2006) notice that managers will use repurchases to meet or beat these EPS forecasts.

The outcomes of the two samples will be presented in Chapter 6. In chapter 7, I will explain and discuss the outcomes with the article of Hribar et al. (2006) and the trends in the two samples.

5.3 Limitations

The credit crunch stock can have influence on repurchases. When firms have liquidity problems because of the credit crunch, this affects the dollar amounts and number of shares of the repurchases.

After presenting the relative frequency of accretive repurchase in forecast error bins, Hribar et al. (2006) did additional research to investors' pricing when repurchases occur. The research to the share price response of repurchasing firms and the share price response when firms meet or beat the analysts' forecast is not included in this master's thesis. This topic can be investigated in additional research.

Another limitation is my self-constructed ASIF_EPS equations, which makes it more difficult to compare my research outcomes with the results of Hribar et al. (2006).

5.4 Descriptive statistics

First, I want to discuss the remarkable items from table 7. Table 7 reports the descriptive statistics of my repurchase samples. This data was collected from the Compustat database between 1997-2003 and 2004-2009. Repurchasing firms implies that firms repurchased less than 20% of their common shares outstanding at the beginning of the quarter during a given quarter. All transportation, utility and financial institution firms are eliminated from the sample. The descriptive statistics of sample 1 will be compared with the descriptive statistics of Hribar et al. (2006) in this section (see table 6).

Table 6 Descriptive statistics Hribar et al. (2006)

Descriptive statistics for sample of repurchase firms

	Mean	Std. Dev.	25%	Median	75%
<i>Repurchase activity variables</i>					
Dollar value of shares repurchased (\$ Mil.)	34.31	141.04	0.56	3.05	16.42
Estimated number of shares repurchased (in millions)	0.870	2.687	0.038	0.168	0.640
Shares repurchased as a percent of beginning shares outstanding (%)	1.28	1.99	0.18	0.59	1.53
<i>Other variables</i>					
Sales (\$ Mil.)	892.6	2,825.8	46.3	159.1	564.2
Sales growth (%)	14.67	172.65	0.23	5.98	17.56
<i>E/P</i>	0.0474	0.0900	0.0341	0.0557	0.0774
<i>P/E</i> ratio (positive earnings firms only)	27.41	94.36	12.30	16.80	23.72
Share price (\$)	27.64	23.34	11.81	22.13	36.88
Assets (\$ Mil.)	4,006.8	16,024.7	167.5	586.8	2,190.1
Cash (% of assets)	12.4	16.5	1.6	5.0	16.6
<i>EPS</i> (\$)	0.36	0.54	0.13	0.32	0.56

Table 7 reports that repurchasing firms from sample 1 report a mean of \$41,36 million per repurchase. Hribar et al. (2006) report an average of \$34,31million per repurchase. The mean is 20,50% higher than the mean of Hribar et al. (2006). Meanwhile, Hribar et al.'s (2006) median of the repurchase amount is higher than the median of my sample. The median of Hribar is \$3,05 million and the median of my sample is \$2,36. This mean a decrease of 22,6% compared to the median of Hribar et al. (2006).

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Thereafter, sample one's mean of shares repurchased is 1,12 million shares against a mean of 0,87 million shares find by Hribar et al. (2006). The mean of shares repurchased is increased by 28,7%. The median of the average number of shares repurchased shows a small increase (7,1%) compared to the median of Hribar et al. (2006). The median of shares repurchased of the first sample is 0,18 million shares and the sample of Hribar et al's shows a median of 0,168 million repurchased shares.

Table 7 also presents a mean of 1,45% for the repurchased shares as a percentage of shares outstanding at the beginning of current quarter and a median of 0,65% % for the repurchased shares as a percentage of shares outstanding at the beginning of current quarter. While Hribar et al. present a mean of 1,28% and a median of 0,59% % for the repurchased shares as a percentage of shares outstanding at the beginning of current quarter. Thereby, I conclude that the mean (median) of number of shares as a percentage of shares outstanding is increased by 13,3% (10,2%). Table 7 also report information of sales, E/P, end of the year price, value of assets, cash as a percentage of sales¹³ and at last basic EPS.

Table 7 Descriptive statistics samples

Descriptive statistics sample 1	Mean	Std. Dev.	1st quartile	median	3 rd quartile
Dollar value of shares repurchased (\$ Mil.)	41,36	177,66	0,35	2,36	15,55
Estimated number of shares repurchased (in millions)	1,12	2,13	0,04	0,18	0,77
Shares repurchased as a percent of beginning	1,45	2,28	0,2	0,65	1,69
Shares outstanding (%)					
Other variables					
Sales (\$ Mil.)	968,68	3641,95	26,86	122,9	487,78
E/P	0,01	0,03	0	0,01	0,02
Share price (\$)	19,18	28,28	8	17,75	32,25
Assets (\$ Mil.)	4070,15	18575,37	104,68	433,12	1895,25
Cash (% of assets)	14,34	16,98	1,99	7,01	21,3
EPS (\$)	0,26	0,72	0,03	0,23	0,48

¹³ Some firms (most inactive) have less sales and a high cash level, this harms the mean of cash as a percentage of sales. By these firms I take cash as a percentage of assets.

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	Mean	Std. Dev.	1st quartile	median	3rd quartile
Descriptive statistics sample 2					
Dollar value of shares repurchased (\$ Mil.)	110,04	463,11	0,48	5,13	48,49
Estimated number of shares repurchased (in Mil.)	3,43	14,52	0,04	0,29	1,62
Shares repurchased as a percent of beginning	1,29	2,09	0,08	0,32	0,65
Shares outstanding (%)					
Other variables					
Sales (\$ Mil.)	2127,66	6641,67	69,78	324,15	1350,93
E/P	0,03	5,34	0,0045	0,01	0,0168
Share price (\$)	17,16	23,16	12,495	24,94	40,485
Assets (\$ Mil.)	9907,51	36566,43	319,23	1475,50	5963,07
Cash (% of assets)	11,76	10,86	4,66	8,07	15,93

The dollar value of shares repurchased is taken from the statement of cash flows (Compustat item PRSTKCY, minus preferred stock repurchases (Compustat item PSTKQ) or redemptions (Compustat item PSTKRQ). The estimated number of shares repurchased for sample 1 is computed by taking CF_Repurch divided by the sum of the lowest and highest price of shares (see text-box 5). The number of shares repurchased for sample 2 is taken from total shares repurchases (Compustat item CSHOPQ). The sales of current quarter are taken in millions of dollars. E/P is the 3-months earnings divided by common shares used to calculate BASIC EPS. Price is the beginning of year share price. Assets are the book value of assets at the end of the quarter. Cash is the level of cash and marketable securities as a percentage of total sales or assets.

By table 8, I conclude that the mean of fixed items as sales and assets are in line with the outcomes of Hribar et al. (2006). The high decreases in the median could be caused by a higher proportion of relative high amounts for repurchases from large companies which have high influence on the mean but not on the median.

Table 8 Comparison other descriptive statistics Hribar et al. (2006) and sample 1

	Mean sample 1	Median sample 1	Mean Hribar et al. (2006)	Median Hribar et al. (2006)	percentage mean	percentage median
SALES	968,68	122,9	892,6	159	9%	-23%
E/P	0,01	0,01	0,04	0,0557	-75%	-82%
share price	19,18	17,75	27,64	22,13	-31%	-20%
Assets	4070	433,12	4006	586	2%	-26%
cash as a percentage of sales	14,34	0,07	12,4	5%	16%	40%
EPS	0,26	0,23	0,36	0,32	-28%	-28%

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Table 9 Yearly descriptive statistics repurchase sample 1

	Purchase amount of stock (\$Mil.)	Number of shares repurchased (Mil.)	Mean purchase of stock (\$Mil.)	Mean number of shares repurchased (Mil.)	Number of repurchases	Number of accretive repurchases	Percentage of accretive repurchases	After-tax Treasury-bill percentage
1997	116003	2884	34,09	0,85	3404	216	6,35%	3,23%
1998	157683	4241	37,04	1	4257	293	6,88%	3,63%
1999	160868	4452	36,3	1	4432	343	7,74%	3,72%
2000	162843	5302	38,74	1,26	4204	538	12,80%	1,48%
2001	152156	5261	41,48	1,43	3668	269	7,33%	0,92%
2002	160930	6296	49,23	1,93	3269	219	6,70%	0,65%
2003	177664	6553	57,74	2,13	3077	238	7,73%	1,43%
	1088148	34988	41,32	1,45	26311	2116		

In table 9, I have split sample 1 into yearly descriptive statistics. I found an increasing dollar amount of stock repurchases (equal increase number of shares), while the number of repurchases is relatively stable (decreases at the end). This explains the difference between the mean of Hribar et al. (2006) and the mean of sample 1. Over time, firms tend to repurchase a higher number of shares for higher dollar amounts. Remarkable is the fact that the median purchase amounts and the number shares repurchased of sample 1 is still far under the mean of these variables.

Moreover, the yearly descriptive statistics of table 9 report a year where more than 12,80% of the repurchases are accretive. This phenomenon also occurs in 2008 (see Table 10 10,15% in 2008). Thereby, I suggest an opportunity for firms to take advantage of higher E/P ratios, when the treasury-bill rate decreases. It seems that firms have more intention to repurchase stock, when the treasury-bill rate decreases.

Table 7 also describes the descriptive statistics of sample 2. For sample 2, the descriptive statistics report a significant increase of both repurchased dollar amount as the repurchased number of shares. The total amount of repurchases in sample 1 was more than \$1088 billion, while the total amount of repurchases in sample 2 was approximate \$2641 billion (increase of 142%). But the repurchases are made a long time ago, that is why I want to index them.

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When I index the repurchases of sample 1 with 2% per year, the repurchases will be \$1323 billion. The repurchases of sample 2 are increased by 99% from sample 1.

The following percentages are calculated as sample 2 minus sample 1 divided by sample 1. The descriptive statistics present a mean repurchase dollar amount of \$101,14 million (+146% and a median of \$5,13 (+117%). The number of shares repurchased in sample 2 is 82 billion shares (+134%) and a median of 0,29 million shares (+61%). The repurchases in sample 2 represent mean of 1,29% % for the repurchased shares as a percentage of shares outstanding at the beginning of current quarter (-12,4%) and a median of 0,32% % for the repurchased shares as a percentage of shares outstanding at the beginning of current quarter (-103%). Table 6 incorporates important information about sales and value of assets of the repurchase sample. The mean of both assets and sales are significant higher than in sample 1 (respectively 43,4% and 19,6%). Thereby, I conclude that the number repurchases with small dollar amounts increased significantly. Also find a higher number of repurchases with high amounts. The spread in the sample is higher in the second sample. This trend is also observable in the number of shares repurchased. I suggest that there are larger entities in the second repurchase sample, because the mean for the repurchased shares as a percentage of shares outstanding at the beginning of current quarter decrease despite the increasing repurchase number of shares repurchased.

Then, the descriptive statistics present an increase in E/P. This increase could be an incentive for managers to repurchase stock. When the E/P ratio is higher than the Treasury-bill rate (r) of current quarter (t) repurchases can be accretive. The descriptive statistics show also a decrease in the cash level as a percentage of sales during the sample from sample 1.

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Table 10 Yearly descriptive statistics repurchase sample 2

	Purchase amount of stock (\$ Mil.)	Number of shares repurchased (Mil.)	Mean purchase of stock (\$Mil.)	Mean number of shares repurchased (Mil.)	Number of repurchases	number of accretive repurchases	percentage of accretive repurchases	after-tax Treasury-bill percentage
2004	256025	9230	89,86	3,24	2849	181	6,35%	2,73%
2005	414070	13915	117,10	3,94	3536	249	7,04%	2,92%
2006	561648	17950	137,73	4,4	4078	337	8,26%	3,23%
2007	732077	19877	161,61	4,39	4530	370	8,17%	3,26%
2008	487801	14956	98,05	3,01	4975	505	10,15%	1,25%
2009	180373	6087	17,89	0,51	3943	243	6,16%	0,10%
	2631994	82015	101,14	3,43	23911	1885		

The same as for sample 1, I divide the repurchases of sample 2 into yearly descriptive statistics (see table 10). I found an increasing dollar amount of stock repurchases until 2008. The number of shares repurchased follow the same trend is relative stable (decreases at the end). Over time, firms tend to repurchase a higher number of shares for higher dollar amount. The annual number of repurchases is also in sample 2 stable. Remarkable is the fact that the median purchase amounts and the number shares repurchased of sample 1 is still far under the mean of these variables.

Remarkable is the fact that the number of accretive repurchases of sample 1 and sample 2 are quite similar, despite the fact that the amounts of repurchases are significantly higher. This also suggests a higher population of huge firms in sample 2.

Then, I have to explain the huge increase in amount of repurchases between 2003 and 2004. The total dollar amount of the repurchased shares in years 2003 (178 million) and 2004 (256 million) are different (approximate 44% increase in 2004 compared to 2003).

Table 11 reports an increase of the Treasury-bill rate and a small increase of the E/P mean of the all repurchase. When the treasury-bill rate increase, repurchase are less attractive for firms because they increase EPS more difficult. That why I predict a stable amount of stock repurchases. In fact, the repurchases increased significantly.

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Table 11 Explanation increase stock repurchases between 2003 and 2004

E/P	all repurchases		
year	observations	mean	Treasury-bill rate
2003	1340	3,37%	1,43%
2004	2849	3,75%	2,73%

Thereby, I found that not all repurchases are shown under Compustat item PRSTKCY during the research. Some firms miss a number in the purchase of stock item (PRSTKCY), while the total shares repurchased (Compustat item CSHOPQ) and the average price paid for the repurchase (Compustat item CSHOPP) describe a repurchase. Then, I calculate the purchase of stock in dollar (PRSTKCY) by average price paid per share multiplied by the total shares repurchased. This suggests that the total dollar amount of repurchases increased by the new regulation.

In the future, there could be more accurate estimates of shares repurchased by the new regulation of the SEC (see section 2.9 and appendix IV). It is also possible that because of the new regulation huge firms which relatively small repurchases will notice their repurchases in their financial statements while they did not before the regulation. This might be an indication for the presence of lower repurchases in the second repurchase sample.

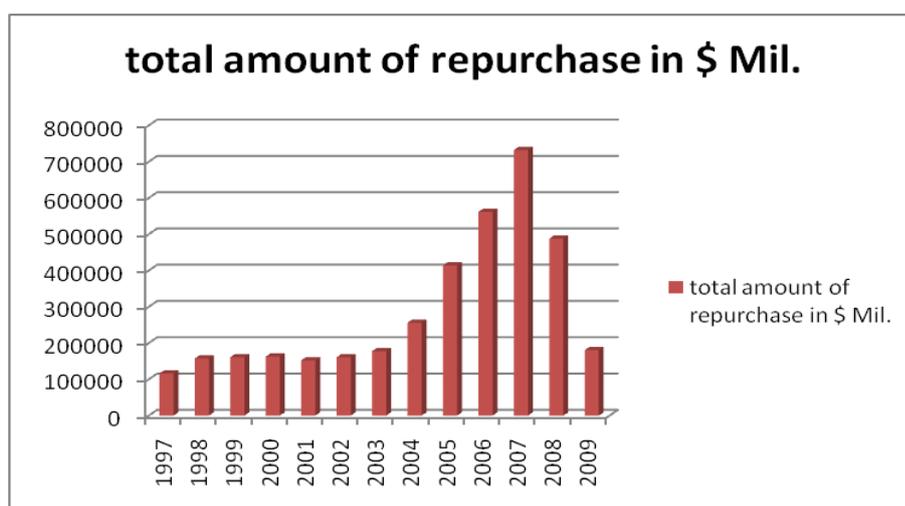
For example, when Microsoft inc. repurchases 0,001% of their shares outstanding for a total amount of \$10 million, this transaction will have less influence on firms' performance or financial position. In this way, it does not have material influence on decision making of investors. Why would they even notice the total amounts in their financial statements? When firms notify their repurchases in financial statements Compustat will integrate this data in their database. Now, firms are required to notify their average paid cash, the total amount and number of shares per month in the quarterly financial statements.

Another interesting finding is the trend of repurchases during my research period (1997-2009). In figure 2, I illustrate the trend of the stock repurchases. Here, I notice that stock repurchases grow over time and decreases when the market is pessimistic (credit crunch

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during 2008 and 2009). Meanwhile, firms that face high earnings and excess cash could easily increase EPS in these years.

Figure 2 total yearly dollar amount of repurchases during the samples



Second, from both sample there are firm-quarter that face losses (see Table 12). These firms are not able to improve EPS numbers by repurchasing stock. Sample 1 includes 5.354 firm-quarters (20,36% of repurchasing firms) that report a loss for the quarter. Sample 2 includes 4.190 firm-quarters (17,52%) with losses.

Table 12 losses/profits repurchase samples

	sample 1		sample 2	
profits	20946	79,64%	19720	82,48%
losses	5354	20,36%	4190	17,52%
total	26300	100,00%	23910	100,00%

Third, I summarized the descriptive statistics of accretive repurchases for samples 1 (sample 2) in Table 13 and (Table 18). The results differ from the result of Hribar et al. (2006) because of the different approaches used to compute the pre-purchase EPS (see text-boxes 6 and 7). The different as-if equals make the number of the accretive repurchases incomparable. The accretive repurchases are subject to the same trend as the total repurchase sample (higher firms that repurchase stock). Hribar et al. (2006) found 2.473

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accretive repurchases in 11 years (1990 to 2000), while my first sample includes only 7 years (1997-2003). When I index Hribar et al. (2006), the number of accretive repurchase will be 1.574.

Table 13 Yearly descriptive statistics accretive repurchase sample 1

year	Purchase of stock (total amount in \$ Mil.)	Total number of shares (Mil.)	Total accretive repurchases	Average purchase of stock (\$ Mil.)	Average number of share repurchased	Average Basic EPS	Average Diluted EPS	Average assets	Average sales	Average percentage of shares repurchased
1997	19537	411	216	90,45	1,9	0,86	0,87	5019,47	240,06	3,69%
1998	23353	698	293	79,7	2,38	1,03	1	4135	206,04	3,88%
1999	23420	666	343	68,28	1,94	0,91	0,88	3021,82	418,58	3,75%
2000	32205	1221	538	59,86	2,27	0,85	0,82	1842,3	535,64	3,69%
2001	24351	698	269	90,52	2,6	1,07	1,01	4748,78	992,19	3,02%
2002	33708	887	219	153,92	4,05	0,94	0,88	6167,81	575,82	4,54%
2003	30530	732	238	128,28	3,07	1,14	1,06	7687,06	1313,24	3,20%
	187104	5312	2116	111,84	3,04	1,13	1,09	4747,87	713,59	3,67%

Table 13 reports 2116 accretive repurchases (+34,5%¹⁴). But probably there are a lot of repurchases eliminated by more strict ASIF_EPS equals (see text-box 6 and 7). To illustrate the effects of the weighted average the repurchase to the accretive repurchases the results of robustness test are presented in section 6.3. The accretive repurchases of sample 1 amount \$187,104 billion and represent in total 5,3 billion repurchased shares. In sample 1 the average assets of the accretive repurchase sample (4.747 million) is comparable with the repurchase sample (4.070 million). As predicted is the mean number of shares repurchased as a percentage of shares outstanding of the accretive sample (3,67%) higher than the mean of the repurchase sample 1 (1,45%). Moreover, in 2002 and 2003 starts the trend of higher total dollar amounts used for repurchases and large companies that repurchase shares under the accretive repurchases. At last, year 2000 is an outlier for the percentage of accretive repurchases as a percentage of yearly repurchases.

¹⁴ This percentage is calculated as sample 1 minus Hribar et al.'s outcomes divided by Hribar et al.'s outcomes.

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The descriptive statistics of tables 14 to 17 and table 19 to 22 are written in this paragraph. First, the mean is the average of all observation of E/P divided by the total number of observation. E is the earnings for common shareholders 12-months moving, and P is the market value of an entity at the end of current year. By E/P lowest is the E still the earnings for common share holders divided by the lowest P. The lowest P is the lowest market value of current years and estimated as lowest share price multiplied by common shareholders used to calculate basic EPS.

Table 14 Earnings-to-Price repurchase sample 1

E/P	all repurchases		
year	Observations	mean	Treasury-bill rate
1997 ¹⁵	1436		3,23%
1998	1789	1,54%	3,63%
1999	1759	2,64%	3,72%
2000	1704	4,70%	1,48%
2001	1597	3,00%	0,92%
2002	1437	3,30%	0,65%
2003	1340	3,37%	1,43%

Table 15 Lowest Earnings-to-Price repurchase sample 1

E/P lowest	all repurchases		
year	Observations	mean	Treasury-bill rate
1997	1436	2,58%	3,23%
1998	1789	2,48%	3,63%
1999	1759	2,80%	3,72%
2000	1704	5,80%	1,48%
2001	1597	4,59%	0,92%
2002	1437	4,34%	0,65%
2003	1340	4,00%	1,43%

¹⁵ The market value at the end of 1997 is unavailable in Compustat. The database starts collecting this data from 1998.

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Table 16 Earnings-to-Price accretive repurchase sample 1

E/P	accretive repurchases		
year	Observations	mean	Treasury-bill rate
1997	216		3,23%
1998	293	10,07%	3,63%
1999	343	10,22%	3,72%
2000	538	11,21%	1,48%
2001	269	9,09%	0,92%
2002	219	9,58%	0,65%
2003	238	7,82%	1,43%

Table 17 Lowest Earnings-to-Price accretive repurchase sample 1

E/P lowest	accretive repurchases		
year	Observations	mean	Treasury-bill rate
1997	216	10,59%	3,23%
1998	293	13,52%	3,63%
1999	343	13,63%	3,72%
2000	538	17,65%	1,48%
2001	269	15,54%	0,92%
2002	219	13,93%	0,65%
2003	238	13,91%	1,43%

Tables 14 and 15 present the characteristics of the E/P for all repurchases. Table 16 and 17 present the E/P by accretive repurchases. These tables logically explain repurchase decision. For example 2000, where the treasury-bill rate (1,48%) decrease and the mean of E/P (4,70%) for all repurchasing firms is relative high. Moreover, when I divide the earnings of all repurchasing firms by lowest market value¹⁶ the E/P is 5,80%. Timing of repurchases could be an advantage for firms to improve EPS number.

The E/P of the accretive repurchases in 2000 is about 10,22% and with well managed repurchases (repurchased at the lowest share price that year) 17,65%. The E/P of 2000 is the highest of sample 1. Also the accretive stock repurchases as a percentage of total repurchases is the highest in this year (see table 9). The same counts for 2008 (table 10), looking at tables 19 and 20 (all repurchases), 21 and 22 (accretive repurchases). I suggest

¹⁶ Lowest market is estimated as common shares outstanding used to calculate basic EPS x lowest annual share price.

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the best opportunities to improve EPS number occurs when treasury-bill rate is low and the E/P is high.

Table 18 Yearly descriptive statistics accretive repurchase sample 2

year	Purchase of stock (total amount in \$ Mil.)	Total number of shares (Mil.)	total accretive repurchases	Average purchase of stock (\$ Mil.)	Average number of share repurchased	Average Basic EPS	Average Diluted EPS	Average assets	Average sales	Average percentage of shares repurchased
2004	50615	1417	181	279,64	7,83	2,26	2,14	13078,1	3879,62	4,01%
2005	78939	2005	249	317,02	8,05	2,06	1,99	15584	4849,46	3,36%
2006	162061	3461	337	480,89	10,27	3,04	2,95	23296,5	6621,53	3,33%
2007	201583	4666	370	544,82	12,61	2,11	2,07	21646,3	6135,57	3,89%
2008	190599	3932	505	377,42	7,79	2,73	2,7	20476,3	5979,46	3,42%
2009	70548	2000	243	290,32	8,23	2,12	2,09	13613,6	4041,99	3,14%
	754345	17480	1885	381,69	9,13	2,38	2,32	17949,1	5251,27	3,53%

Table 18 describes the descriptive statistics of accretive repurchase for sample 2. This sample includes in total 1885 accretive repurchases. These repurchases amount in total \$754,345 billion and represent in total 17,5 billion repurchased shares. As in sample 1, the mean number of shares repurchased as a percentage of shares outstanding at the beginning of the quarter (3,53%) is higher than the mean of the repurchase sample (1,29%). The average assets of the accretive repurchase sample (17.949 million) are different from the repurchase sample (9.907 million). The accretive repurchases of the second sample reflects the trend that already in sample 1 (from 2002). This trend includes a higher number of total dollar amounts used for repurchases by larger entities. The same as year 2000, the accretive repurchases are the highest percentage of total repurchases in 2008. In 2000, the treasury-bill rate also decreases and the E/P ratio increases.

Tables 19 to 22 also report a lot of opportunities for accretive repurchases in the year, where the Treasury-bill rate increases, while the E/P increases. The treasury-bill rate amounts 1,25%, while the mean E/P is 5,48% for all repurchasing firms during 2008. And when I divide the earnings of all repurchasing firms by lowest market value the E/P is 6,83%. Moreover, the E/P of the accretive repurchases is about 11,83% and with well managed

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repurchases (repurchased at the lowest share price that year) 16,16%. I suggest the best opportunities to improve EPS number occurs when treasury-bill rate is low and the E/P is high.

Table 19 Earnings-to-Price repurchase sample 2

E/P	all repurchases		
year	observations	mean	Treasury-bill rate
2004	2849	3,75%	2,73%
2005	3536	4,34%	2,92%
2006	4078	4,07%	3,23%
2007	4530	3,62%	3,26%
2008	4975	5,48%	1,25%
2009	3943	1,97%	0,10%

Table 20 Lowest Earnings-to-Price repurchase sample 2

E/P lowest	all repurchases		
year	observations	mean	Treasury-bill rate
2004	2849	5,08%	2,73%
2005	3536	5,53%	2,92%
2006	4078	5,23%	3,23%
2007	4530	5,53%	3,26%
2008	4975	6,83%	1,25%
2009	3943	5,90%	0,10%

Table 21 Earnings-to-Price accretive repurchase sample 2

E/P	accretive repurchases		
year	observations	mean	Treasury-bill rate
2004	181	8,75%	2,73%
2005	249	10,98%	2,92%
2006	337	6,76%	3,23%
2007	370	9,07%	3,26%
2008	505	11,83%	1,25%
2009	243	8,05%	0,10%

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Table 22 Lowest earnings-to-Price accretive repurchase sample 2

E/P lowest	accretive repurchases		
year	observations	mean	Treasury-bill rate
2004	181	14,61%	2,73%
2005	249	15,58%	2,92%
2006	337	9,38%	3,23%
2007	370	10,87%	3,26%
2008	505	16,16%	1,25%
2009	243	18,86%	0,10%

5.5 Robustness test

The most important assumption in the as-if EPS equations is the weighted timing of the stock repurchases. Repurchases that occur at the end of the quarter have small impact on the post-purchase EPS, despite the big difference of the after-tax Treasury-bill rate and E/P ratios. For repurchases that occur at the beginning of the quarter will have a relative high impact on the post-purchase EPS. This is the reason why I want to do a robustness test for the timing of the repurchase. How many repurchases increase post-purchase EPS when the weighted average of the repurchase is 0,75 or 0,25 instead of 0,5. In the empirical results, the results of the robustness test will be presented.

5.6 Summary

My master's thesis sample includes all US firms listed on the NYSE, AMEX or NASDAQ. The sample period spans from 1997 to 2009 separated into two samples. I make a distinction in two time period because of two reasons. The first reason is the possibility to compare the results of Hribar et al. (2006) with my research. Hribar et al. (2006) did research from 1990 to 2000. The second reason is to make a comparison between the descriptive statistics of repurchases before and after the amendments of rule 10b-18 (effective datum, 2004). The sample includes enough firm-quarter observations to make conclusions about 'stock repurchases as an earnings management device'.

To examine whether stock repurchases are used as an earnings management device, I replicate and extend the research of Hribar et al. (2006). Therefore I replicate the hypotheses of Hribar et al. (2006). The ASIF_EPS equations of Hribar et al. (2006) are extended in my research. Thereby I try to be more accurate in the influence of stock repurchases. To examine how stock repurchases influence EPS, I have to compute the pre-purchase EPS by the extended ASIF_EPS2. The influence of the repurchase to actual EPS is estimated as actual EPS minus pre-purchase EPS. Then, I will use the pre-purchase EPS minus the first quarterly consensus analysts' EPS forecast (is the forecast error) as an indicator to divide all accretive (decretive) repurchases. The absolute and relative number of accretive (decretive) repurchase by forecast error bin will be used to conclude about the hypotheses. This hypotheses refers to meeting or beating analyst' EPS forecasts by stock repurchases.

In this research there are two limitations; first the research of Hribar et al. (2006) also investigates the influence of stock repurchases to the stock return response, while my research this influence is not investigated. Second, the credit crunch can give wrong information about the number of repurchases because firms might have too low cash levels to accomplish intended (accretive) repurchases.

The descriptive statistics of section 5.4 present a huge change in the repurchase amounts (\$) during the sample. Moreover, there is a large increase between 2003 and 2004. This might be the result of more visible stock repurchase by the amendments of rule 10b-18. Thereafter the credit crunch had significant impact on stock repurchases in 2008 and 2009.

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Moreover, there seem to be more large entities under the repurchases, that relatively repurchase less stock. At last I construct a robustness test for the transaction-timing of repurchases. This could be an important indicator to judge about the influence of a repurchase.

6 Empirical results

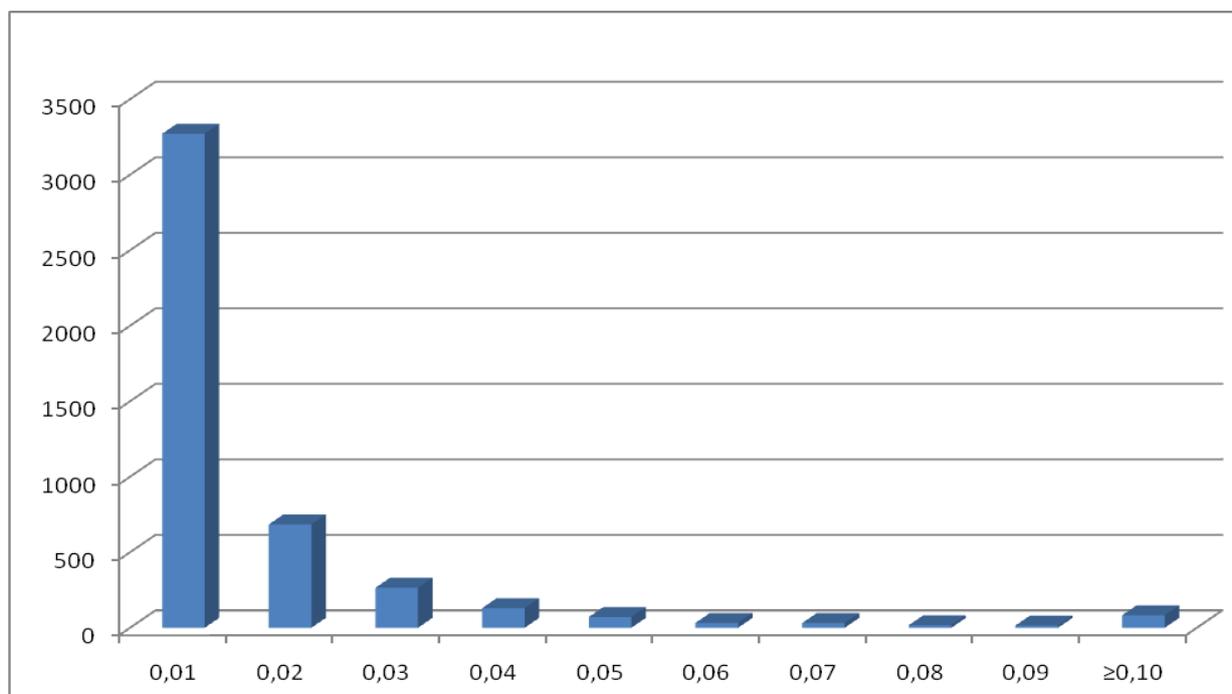
This chapter includes the outcomes of my research. First of all, I will present the results of the ASIF_EPS equals in section 6.1. Second of all, I will present the number of (accretive) repurchases divided to the forecast error bins to accept or reject H1. And at last I will present the results of the robustness test.

6.1 Proportion of accretive repurchases

This section presents the outcomes of ASIF_EPS1 and ASIF_EPS2. These equations are described in text-boxes 6 and 7. Figures 3, 4 and 5 describe the distribution of (accretive or decreative) repurchases in pre-purchase forecast error bins. All figures are made for both samples.

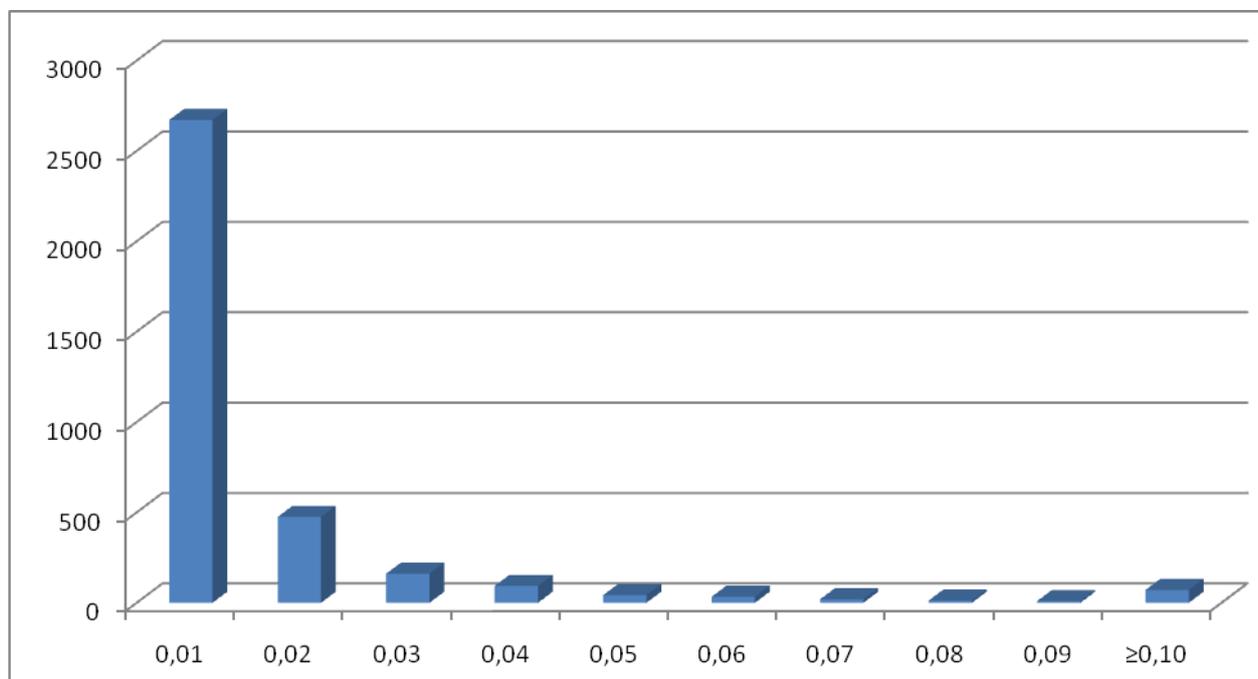
First topic of this section will be illustrated by Figure 3.1 and Figure 3.2. These figures illustrate the outcomes of the ASIF_EPS1 equation. Figure 3.1 (Figure 3.2) illustrates the outcomes of sample 1 (sample 2).

Figure 3.1 Accretive stock repurchases sample 1 according to ASIF_EPS 1



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Figure 3.2 Accretive stock repurchases sample 2 according to ASIF_EPS 1



The results of the empirical test indicates that there are more accretive repurchases of \$0,01 in sample 1 (3300) than in sample 2 (2500). The accretive repurchases of more than \$0,01 (near 1000 repurchases) in sample 1 are also higher than sample 2 (near 800 repurchases). The lower percentage of accretive repurchases is not explained by the average Treasury-bill rate during the period. In sample 1 (sample 2) the average treasury-bill rate is 3,3% (3,4%). Another possible explanation is the difficulty to improve EPS numbers of huge entities in the first sample. Microsoft for example has to repurchase for billions of dollars to obtain approximate 3% of their shares outstanding at the beginning of current quarter. I assume that these companies have not so much excess cash available to accomplish such repurchase.

The accretive repurchases of sample 1 (sample 2) are 17,49% (13,63%) of the total repurchase sample. Hribar et al. (2006) find 17,6% accretive repurchases under their repurchase sample, when they implement their ASIF_EPS1 equation.

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For the ASIF_EPS2 equation, I compute the influence of repurchases with implementing the Ct (opportunity costs) in the pre-purchase earnings. The number of accretive (decretive) repurchases for sample 1 is described in Figure 4.1 (Figure 4.2).

Figure 4.1 Accretive stock repurchases sample 1 according to ASIF_EPS 2

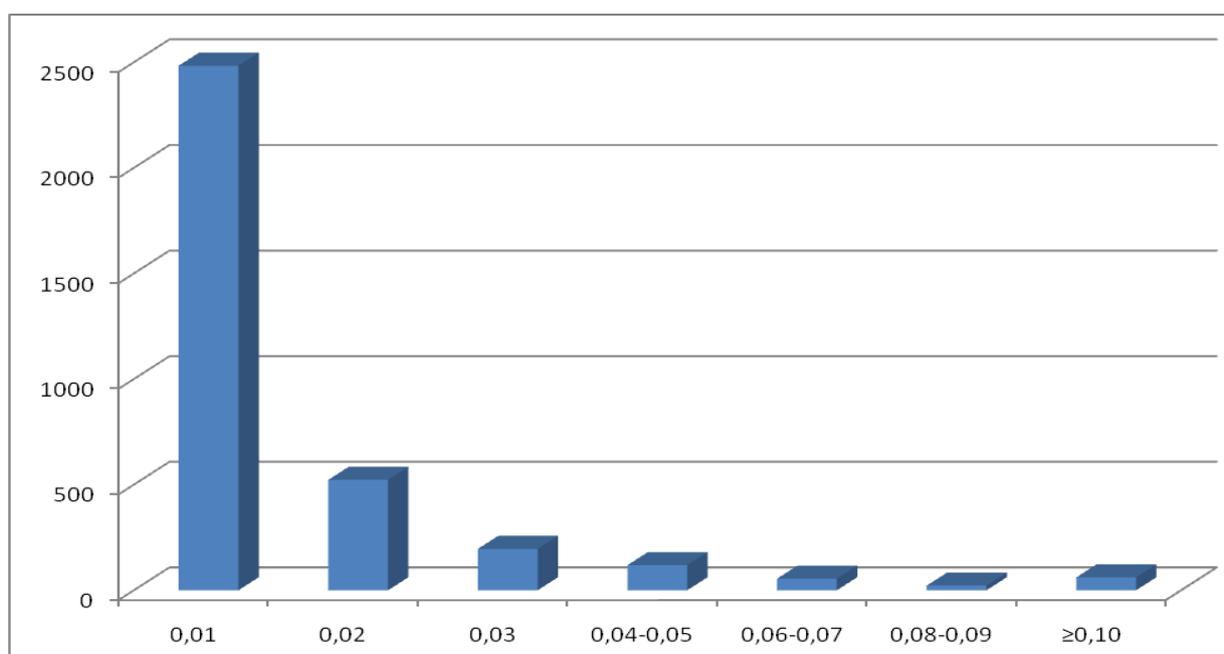
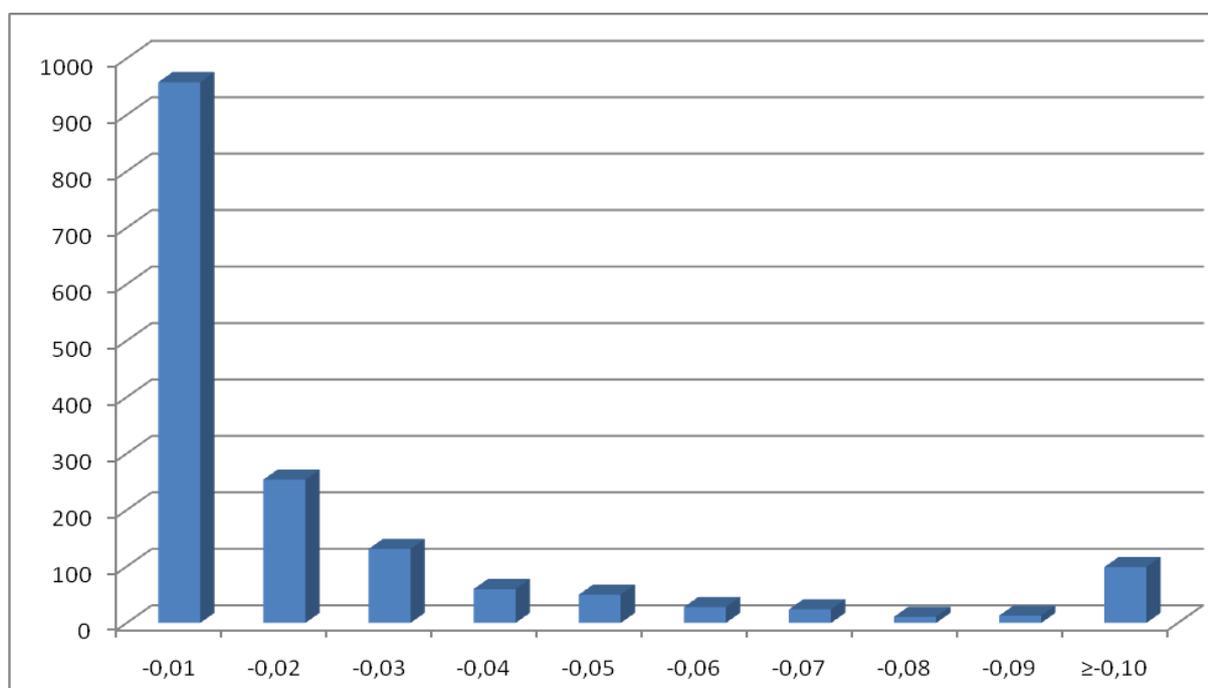


Figure 4.2 Decretive stock repurchases sample 1 according to ASIF_EPS 2



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The accretive repurchases in the \$0,01- \$0,02 bins (Figure 4.1) takes over 87,73% of all accretive repurchases. Hribar et al. (2006) find 84,7% of the accretive repurchases in the \$0,01-\$0,02 bins. These results are quite similar.

Then, I find that the accretive repurchases (2671) amount 14,47% of the first repurchase sample. Hribar et al. (2006) found 9,31% of accretive repurchases in their repurchase sample. The differences (57,6%) are not explained by the (low) Treasury-bill rates (2000-2003) and increase of repurchase amounts during the sample. Hribar et al. (2006) do not take the timing effect into the opportunity costs. Moreover, the difference in E/P (or P/E) ratio between the two samples can also have influences.

In contrast which Hribar et al. (2006), my results indicate a low magnitude of decreative stock repurchases (958). The distribution of 6,19% decreative repurchases in the first repurchase sample is very low compared to Hribar et al. (2006). The decreative repurchases in sample 2 are decreased by 70,6% compared to Hribar et al. (2006). The decreative repurchase are for 74,45% explained by the decreative bins of \$- 0,01 and -\$0,02. Hribar et al. (2006) find 21,1% decreative repurchases under their repurchase sample. Maybe managers know the impact of repurchases to EPS numbers, when firms have an E/P ratio beneath current Treasury-bill rate. Perhaps managers also stop repurchasing stock when it leads to a decrease in EPS. This can be a reason for the high magnitude of low stock repurchase amounts in the first and second sample.

The results of my ASIF_EPS2 equation for the second repurchase sample are presented in figures 5.1 and 5.2. Figure 5.1 (figure 5.2) shows the distribution of accretive (decreative) repurchase.

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Figure 5.1 Accretive stock repurchases sample 2 according to ASIF_EPS 2

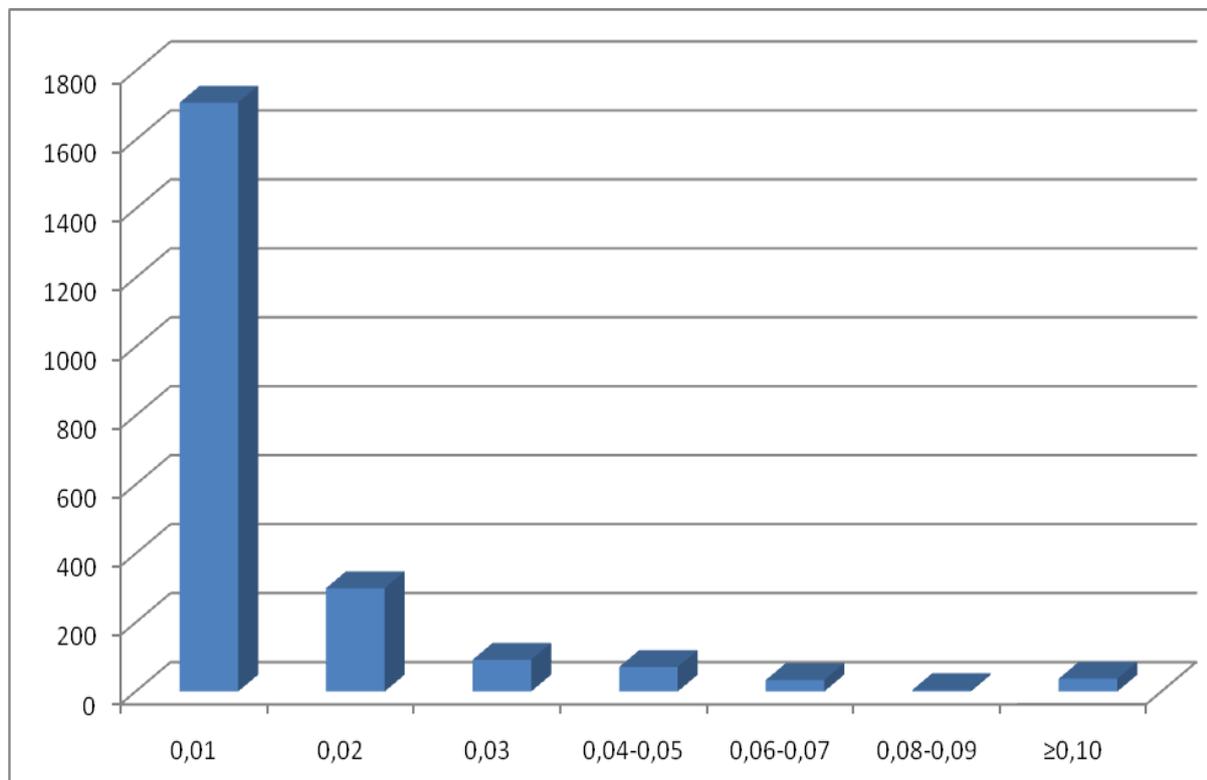
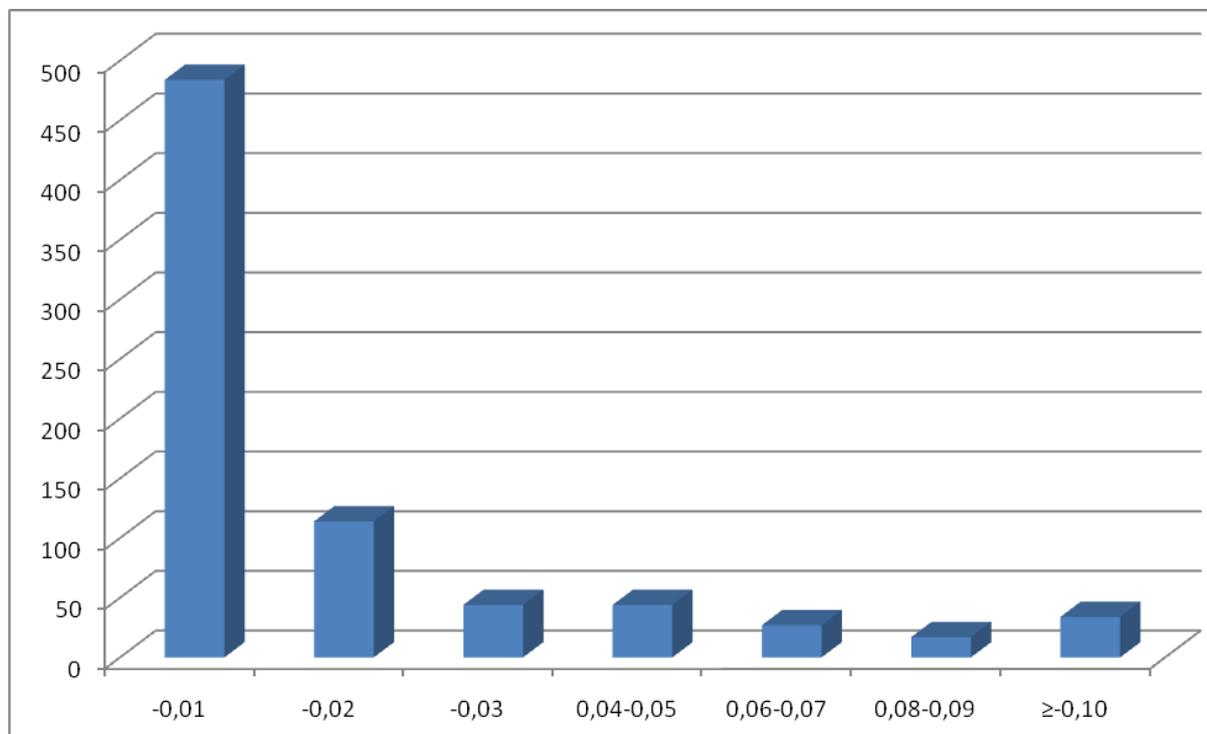


Figure 5.2 Destructive stock repurchases sample 1 according to ASIF_EPS 2



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Figure 5.1 shows that distribution of accretive repurchases is in line with Figure 4.1. The accretive repurchase of \$0,01- \$0,02 takes over 89,44% (87,73%) of all accretive repurchases of sample 2 (sample 1). This means that the \$0,01 and \$0,02 accretive bins increases by 2% from sample 1.

Next, I find that the accretive repurchases (2245) amounts 10,74% (14,47%) of the total repurchase second (first) sample. The decrease of 34,74% from sample 1 is explained by the high magnitude of low purchase amount in sample 2, see descriptive statistics table 7. Here the median is very low compared with sample 1 and the mean of sample 2. Moreover, the increase of huge entities can have negative influence on accretive repurchases. These entities have to spend enormous amounts to repurchases to increase EPS by more than a penny.

I also mention the credit crunch as a reason for the decrease in accretive repurchases. The decrease in the total dollar amount of stock repurchase in 2008 and 2009 (figure 2) can be caused by liquidity problems of the credit crunch. This can have influence on managers' decision to avoid strategic repurchases to improve EPS number.

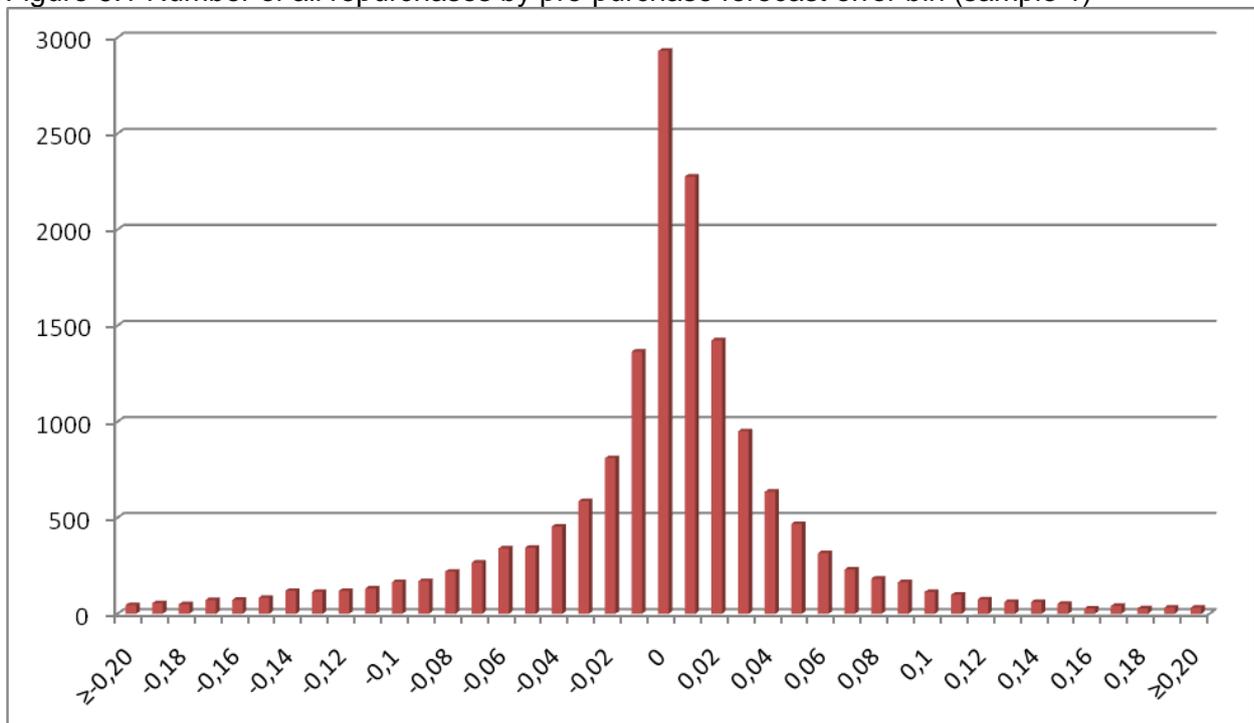
At last, the decreitive repurchases (764) amounts 3,66% of the repurchase sample. That is a decrease of 69,13% compared with sample 1. This concludes that the repurchase are better managed. This trend is already be seen in sample 1 compared with Hribar et al. (2006).

6.2 Stock repurchases around the forecast error

This section describes the stock repurchases around the forecast error bins. I divide all firm observations into repurchase and non-repurchase firms. Then, repurchases will be divided into the pre-purchase forecast error bins. These bins are made by the pre-purchase quarterly EPS minus the quarterly consensus analysts' EPS forecasts. Following Hribar et al. (2006), I use the beginning of quarter EPS forecasts to approximate the market's expectation before firms' repurchase decisions are made. Then, I divide the repurchasing firm-quarters into these bins. Thereafter, I also divide the absolute number of accretive and decreative repurchases in these bins. And at last I divide the relative frequency of accretive and decreative repurchases under the pre-purchase forecast errors.

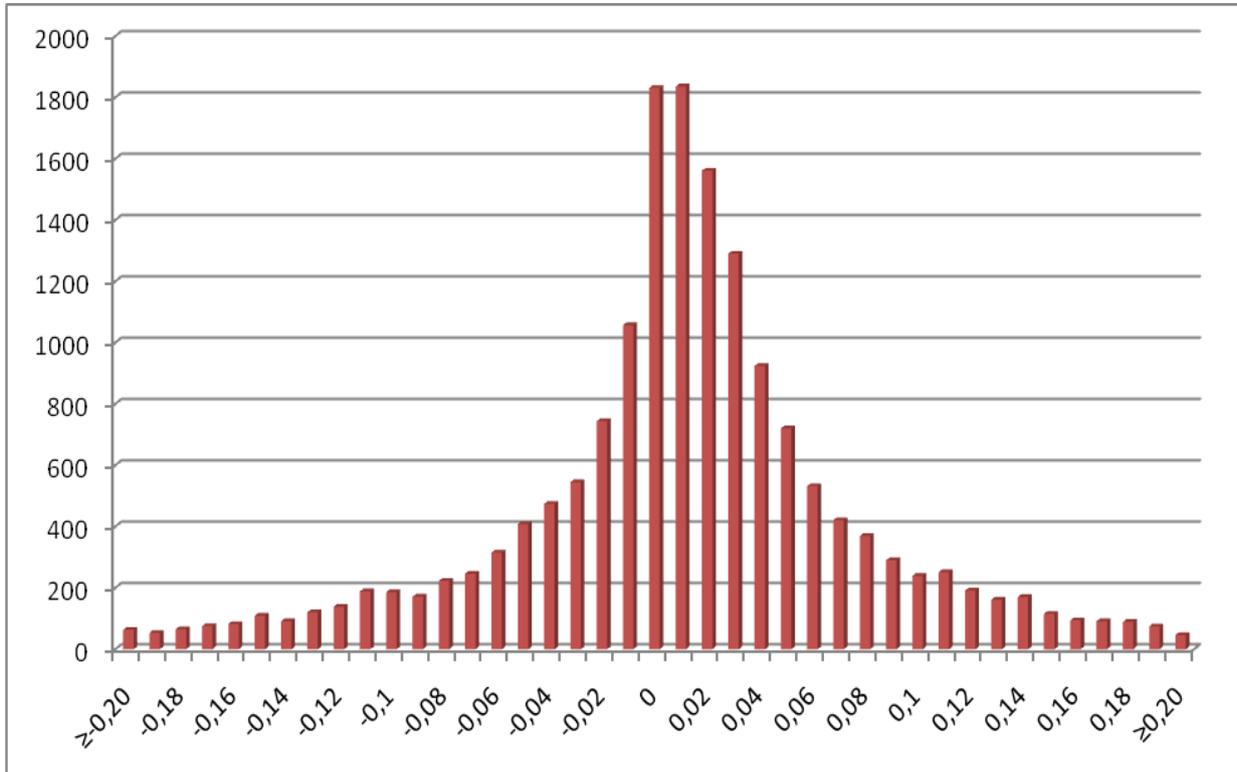
When I divide the firm-quarter observation into pre-purchase forecast errors bin, the results show a normal distribution. The same is observable in the results of the divided repurchases sample (figures 6.1 and 6.2). Figure 6.1 (figure 6.2) represents the distribution of repurchases around the pre-purchase forecast errors for sample 1 (sample 2).

Figure 6.1 Number of all repurchases by pre-purchase forecast error bin (sample 1)



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Figure 6.2 Number of all repurchases by pre-purchase forecast error (sample 2)



Figures 6.1 and 6.2 have both a normal distribution. However, Figure 6.1 has a steeper normal distribution than figure 6.2. This can be a result of volatile earnings caused by the credit crunch or other circumstances in the market. This can be a reason for different outcomes in figure 8.1 and 8.2.

Figure 7.1 (figure 7.2) represent the absolute number of accretive/decretive repurchases divided over the 41 pre-purchase forecast error bins of sample 1 (sample 2).

Stock repurchases as an earnings management device

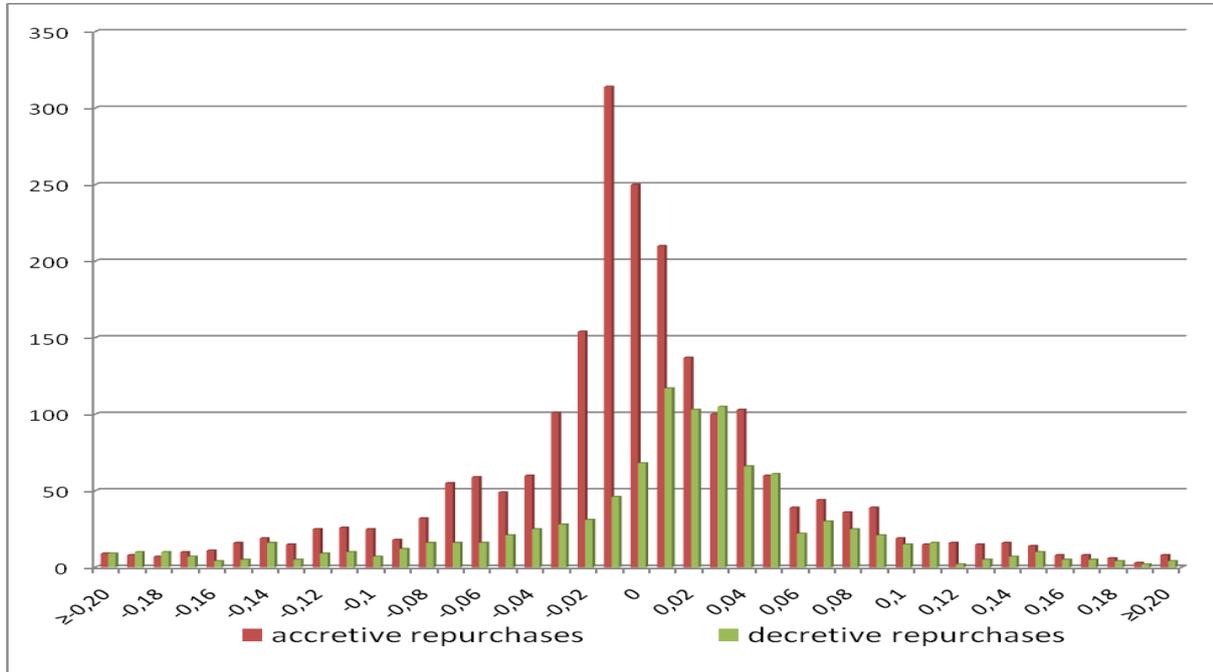
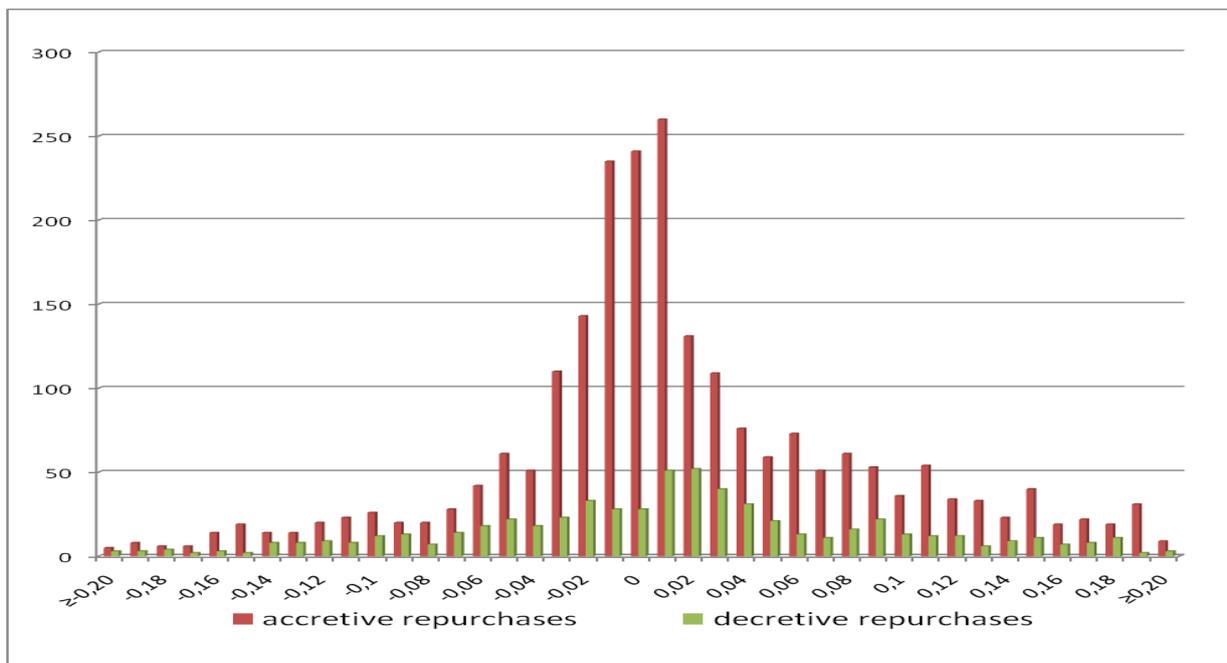


Figure 7.1 Number of accretive and decreative repurchases by pre-purchase forecast error bin (sample 1)

Figure 7.2 Number of accretive and decreative repurchases by pre-purchase forecast error bin (sample 2)



Stock repurchases as an earnings management device

There is a normal distribution observable for the accretive repurchases in both figures (7.1 and 7.2). The normal distribution is also observable for the decreitive repurchase. Only this normal distribution is weaker than the normal distribution of accretive repurchases. Remarkable is the shift of the normal distribution of accretive repurchases to the right in figure 7.2. The shift of the normal distribution is also observable in all repurchases in figure 6.2. This might conclude that when the actual earnings are much higher than the earnings forecast, firms repurchase relatively more stock. This can be explained by a positive E/P (or P/E) or undervaluation in share price in the second repurchase sample.

The total amount of decreitive repurchases in the samples can be affected by the enormous decrease of decreitive repurchases in sample 1 and 2 compared to the research of Hribar et al. (2006). Remarkable is the presence of the highest number of decreitive repurchases between the +0,02 and +0,04 forecast error bins, while the mean of the normal distribution of the repurchases samples lies in the 0,00 forecast bin.

After the normal distributions of repurchases and accretive/decreitive repurchases I will illustrate the accretive (decreitive) repurchases of the first sample (second sample) as a percentage of total firm-observations of pre-purchase forecast error in figure 8.1 (figure 8.2).

Stock repurchases as an earnings management device

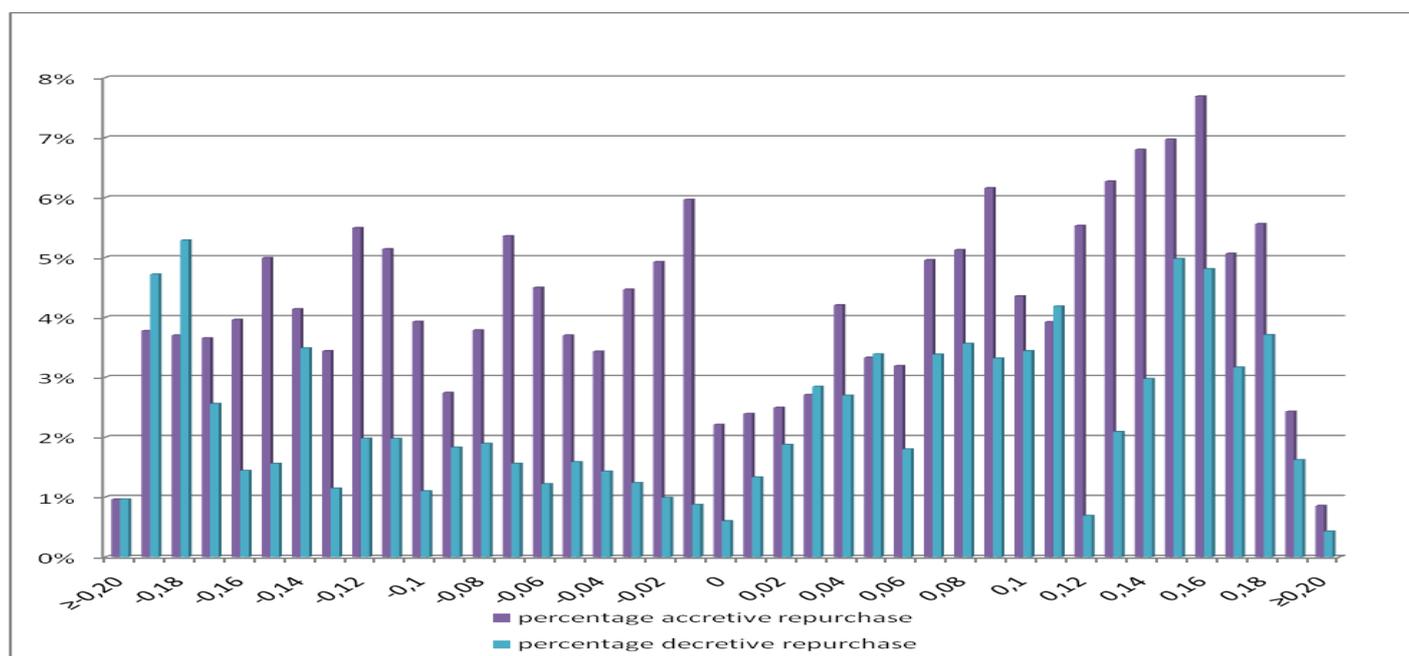


Figure 8.1 relative frequency of accretive/decreative repurchase by forecast error bin Sample1

The results in figures 8.1 and 8.2 are comparable with Hribar et al. (2006). The different percentages can be explained by the higher total sample of Hribar et al. (133,149 firm-quarter). My samples counts in 96.798 and 105.037 firm-quarters. Moreover, the quality of forecasting can also have a huge impact the pre-purchase forecast errors.

In figure 8.1 the relative frequency of accretive repurchase varies from higher than 6,5% (the bins between + 0,12 and +0,15) to less than 1% (bin -0,20 and +0,20)¹⁷. The same as Hribar et al. (2006) there are two forecast error regions with disproportionately large number of accretive stock repurchases: “(1) firms with small negative pre-purchase forecast errors and (2) firms with high positive pre-purchase forecast forecast errors” (Hribar et al., 2006). The trend is not as obvious as in the sample of Hribar et al. (2006). In Hribar et al. (2006) the number of accretive repurchases is relatively higher in the - 0,01 bin. But the disproportional high accretive repurchases in small negative pre-purchase bin forecast errors is still observable.

¹⁷ These scores were higher in the research but following Hribar et al. (2006) outliers (above +0,20 or less than - 0,20) are eliminated from the sample). This counts for all figures in section 6.2.

Stock repurchases as an earnings management device

The peak of the number of accretive repurchases in small negative pre-purchase forecast errors indicates repurchases intended to meet or beat analysts EPS forecasts. The relative high number of accretive repurchases around high positive earnings surprises indicates to undervaluation, cash flow signaling or employee stock option dilution motivation. These motives are also driven by high E/P ratios and is economically attractive for firms (low share price/high earnings). Motives other than meeting or beating EPS forecast seems to be more relevant to managers to repurchase stock, because disproportional high number of accretive repurchases increases around high negative pre-purchase forecast errors. It might be that these opportunities increases or that managers prefer to repurchase stock when the share price is undervalued.

In figure 8.1 the relative frequency of decreitive repurchase varies from higher than 4,5% (the between - 0,18 and -0,19 and +0,14 and +0,15 bin) to less than 1% (bin -0,20 and +0,20). The same as Hribar et al. (2006) the decreitive repurchases increase after the small positive pre-purchase forecast errors right for the 0,00 bin of Figure 8.1. The decreitive repurchases seem to have the opposite trend as accretive repurchases for small positive or small negative earnings surprises. Here decreitive repurchases are absent by small negative or small postitive earnings surprises.

Stock repurchases as an earnings management device

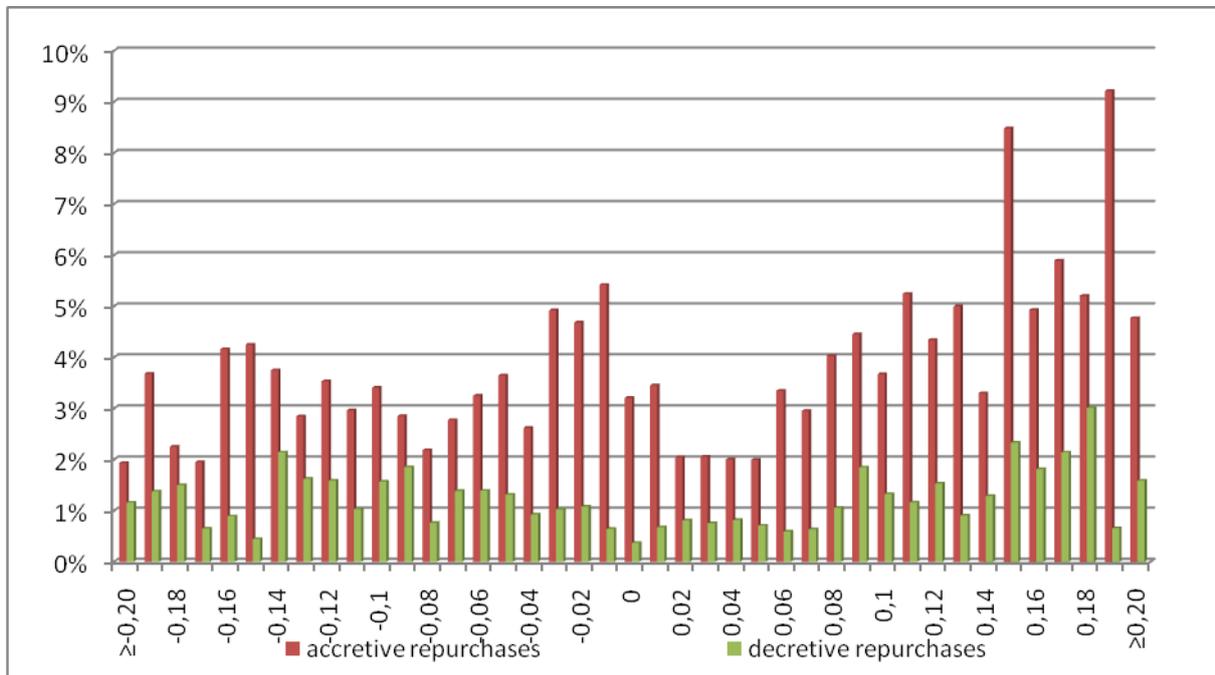


Figure 8.2 relative frequency of accretive/decreative repurchase by forecast error bin Sample2

In figure 8.2 the relative frequency of accretive repurchase varies from higher than 8,0% (the bins + 0,15 and +0,19) to around 2,0% (bin -0,20 and +0,03 to +0,06). The same as my first sample, there are two forecast error regions with disproportionately large number of accretive stock repurchases: (1) firms with small negative pre-purchase forecast errors and (2) firms with high positive pre-purchase forecast errors. The trend is weaker as in sample 1, but the peak still exist. One of the reasons for this difference is the lower number of accretive repurchases than in sample 1. But the high relative number of accretive repurchases in small negative pre-purchase forecast errors bins is still visible. This strengthened the suggestion that firms apply earnings management in small negative pre-purchase forecast errors bin to meet or beat analysts EPS forecasts.

In figure 8.2 the relative frequency of decreative repurchase varies from 3,0% (+0,18 bin) to less than 1% (-0,17; -0,15; -0,08, -0,04 and +0,20 bin). The explanations for this is the high decrease of decreative repurchases in the second sample (less than 4% of the repurchase sample). The same as sample 1, the decreative repurchases increases after the small positive pre-purchase forecast errors right for the 0,00 bin of Figure 8.2. The decreative repurchases

Stock repurchases as an earnings management device

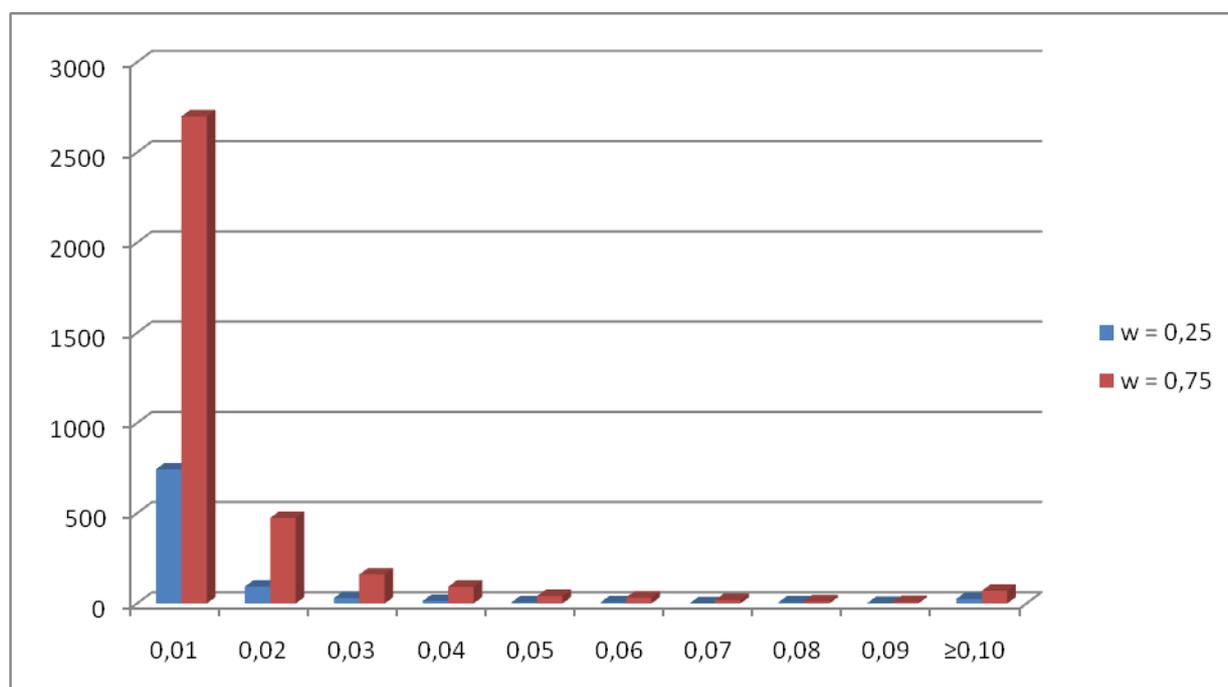
seems to have such low value that they cannot be compared with Hribar et al. (2006) and my second sample.

6.3 Robustness test

This section includes a robustness test for influence of timing to the number of accretive and decreitive repurchases. The robustness tests are done for the ASIF_EPS2 equation. The distribution of accretive or decreitive repurchases presented in section 6.1 are based on repurchases with a weighted average (w) of 0,5. Thereby I assume that the weighted repurchase lays on day 45 of the quarter. In reality this depends on firm decisions, thereby the question arises ‘what is the influence of the purchase when the weighted effect of repurchase is at the 23th day ($w = 0,75$) of current quarter or the 68th day ($w = 0,25$) of the quarter?’.

Figure 9.1 (Figure 9.2) shows the distribution of accretive (decreitive) repurchases for sample1.

Figure 9.1 robustness test transaction timing of accretive repurchases for sample 1



Stock repurchases as an earnings management device

Figure 9.1 shows that there are 3625 accretive repurchase when the time weighted effect of the repurchases amount 0,75, while there were 2671 accretive repurchases by a weighted effect of 0,5. This means that there are 954 (35,7% increase) new accretive repurchases that absent when (w) is 0,5. The spread of accretive repurchases will be different. In the \$0,02 and \$0,03 there is a huge increase.

By the weighted average of 0,25, the accretive repurchases (935) decrease by 61,8%. This means that a lot of accretive repurchases which are repurchased at the end of the quarter will not increase EPS by even a penny.

Figure 9.2 robustness test transaction timing of decretive repurchases for sample 1

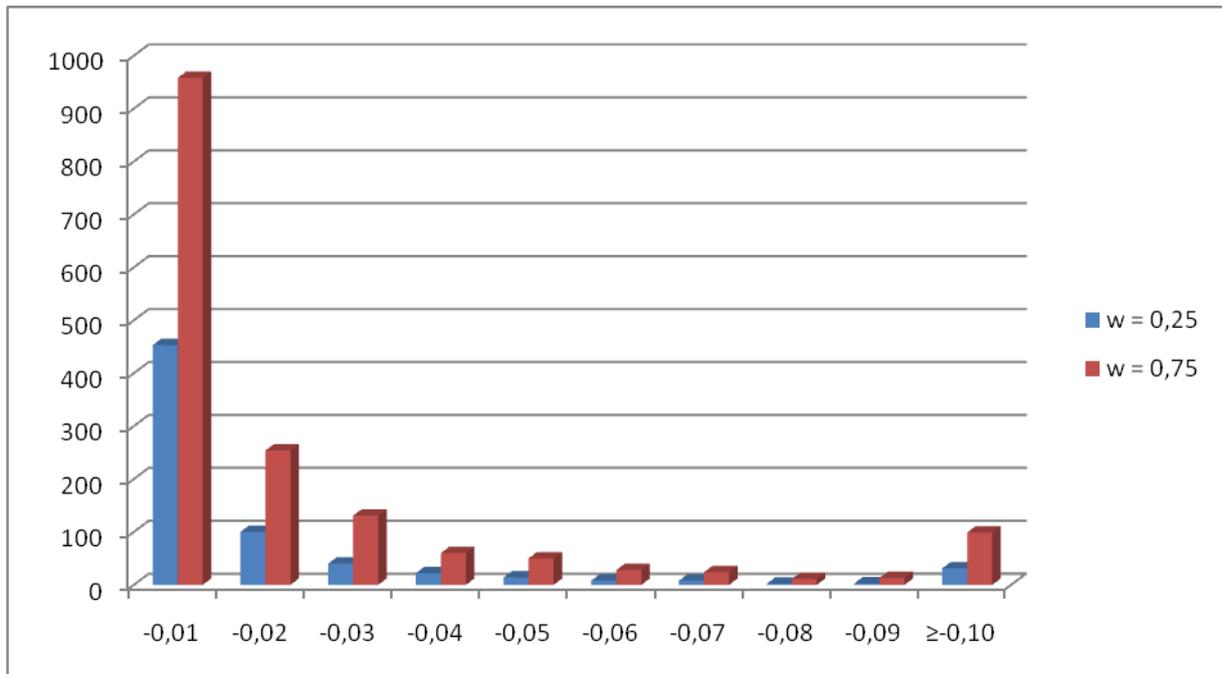


Figure 9.2 shows that there are 1755 decretive repurchase when the time weighted effect of the repurchases amount 0,75, while there were 1628 decretive repurchases by a weighted effect of 0,5. This means that there are 127 (7,8 % increase) new decretive repurchases that absent when (w) is 0,5. The spread of accretive repurchases will be different. In the \$-0,02 and \$-0,03 there is a huge increase.

Stock repurchases as an earnings management device

By the weighted average 0,25 decreitive repurchases (681) decrease by 73%. This means that a lot of decreitive repurchases which are repurchased at the end of the quarter will not decrease EPS by even a penny.

Figure 10.1 (Figure 10.2) presents the distribution of accretive (decreitive) repurchases for sample 2.

Figure 10.1 robustness test transaction timing of accretive repurchases for sample 2

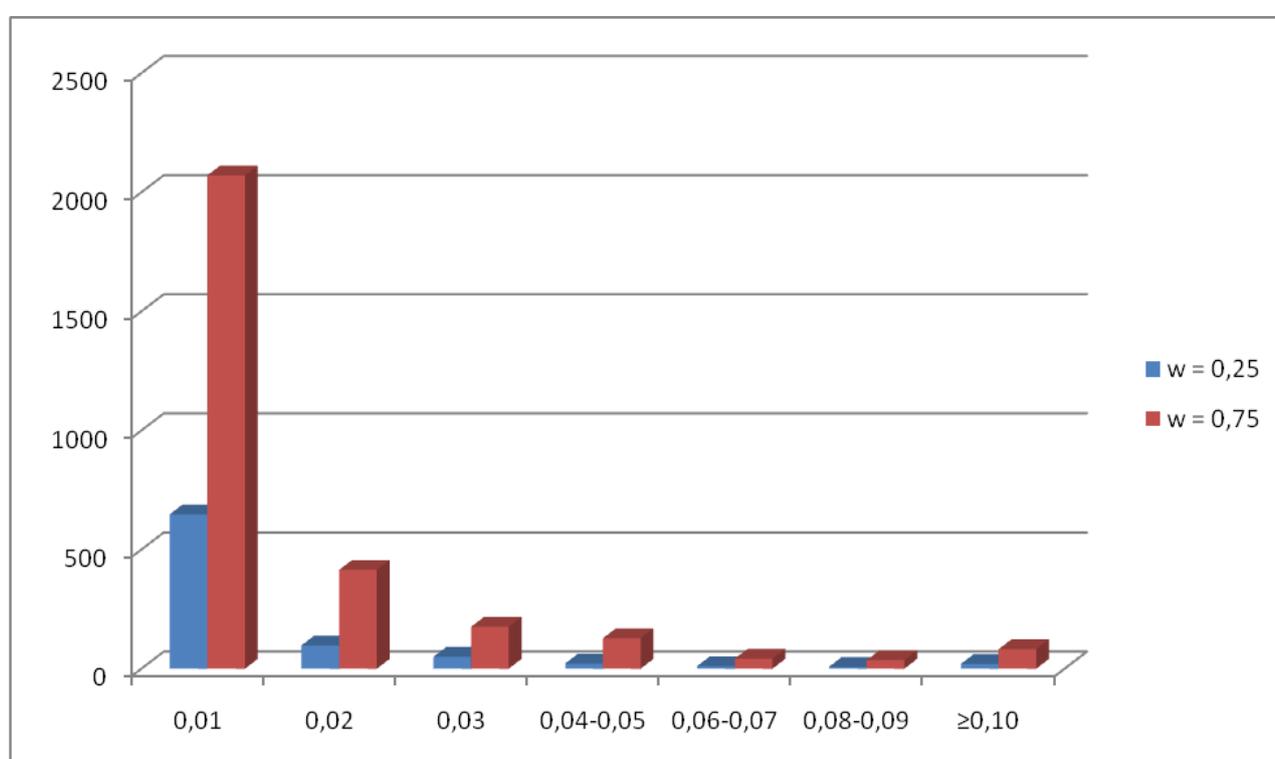


Figure 10.1 shows that there are 2950 accretive repurchase when the time weighted effect of the repurchases amount 0,75, while there were 2245 accretive repurchases by a weighted effect of 0,5. This means that there are 705 (31,4% increase) new accretive repurchases that absent when (w) is 0,5. The spread of accretive repurchases will be different. In the \$0,02 and \$0,03 there is a huge increase.

Stock repurchases as an earnings management device

By the weighted average of 0,25 accretive repurchases (857) decrease by 73%. This give more reason to suggest that a lot of accretive repurchases which are repurchased at the end of the quarter will not increase EPS by even a penny.

Figure 10.2 robustness test transaction timing of decretive repurchases for sample 2

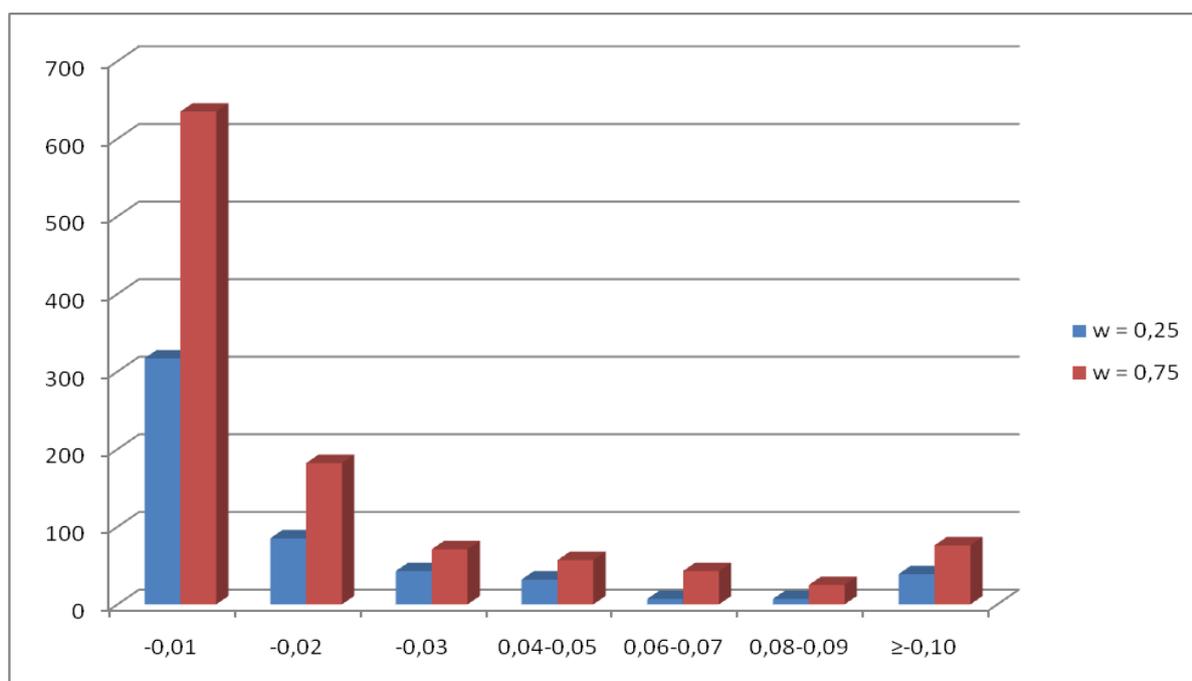


Figure 10.2 presents that there are 1089 decretive repurchase when the time weighted effect of the repurchases amount 0,75, while there were 764 decretive repurchases by a weighted effect of 0,5. This means that there are 325 (43,5% increase) new decretive repurchases that absent when (w) is 0,5. The spread of accretive repurchases will be different. In the \$-0,02 and \$-0,03 there is a huge increase.

By the weighted average 0,25 decretive repurchases (530) decrease by 30,6%. This means that a lot of accretive repurchases which are repurchased at the end of the quarter will not decrease EPS by even a penny.

7 Data analyses

The obtained data of sample 1 is assumed to be comparable with Hribar et al. (2006). The most important differences between my first sample and Hribar et al. (2006) are the mean (median) of repurchased dollar amount, number of shares repurchases and number of shares as a percentage of the shares outstanding at the beginning of the quarter. The mean (median) of the repurchased dollar amount has increased by 20,50% (decreased by 22,6%). The mean (median) of the number of shares repurchases is increased by 28,7% (+ 7,1%). And at last, the mean (median) of the number of shares as a percentage of the beginning shares outstanding has increased by 13,3% (+10,2%). These changes are attributable to the trend of repurchases. In this trend there are higher amounts used for repurchases by large entities. There are also a higher number of repurchases with very small dollar value of repurchases. The number of repurchases is on the other hand stable. The increase of the dollar value of repurchase programs can also be seen in figure 1 of section 2.1.

The other variables like assets and sales are quite similar to Hribar et al. (2006) in sample 1. Important fact is that these variables are generally less changeable than EPS, share price, E/P. The mean of EPS, share price, E/P ratio of Hribar et al. (2006) are significant different from my first sample.

Remarkable is the huge decrease of decreative repurchases in sample 1 compared with Hribar et al. (2006). The explanation can be that firms avoid repurchases that decrease firms' EPS numbers.

Then, I compare the results of sample 2 with sample 1. The data of my second sample represent an increase of the mean (median) repurchase amount of 99%¹⁸ (+77%). The mean (median) of the number of shares repurchased increased by 134% (+61%). The mean percentage repurchased shares to the beginning shares outstanding decreased by 12,4% (-103%). Thereby the descriptive statistics represent a significant increase in sales and assets amounts. The mean of assets (sales) is increased by 43,4% (19,6%).

¹⁸ Both median and mean are indexed by $1 + 0,02\% \wedge$ per year.

Stock repurchases as an earnings management device

The samples indicate for a trend of increasing larger firms under the research population. I also find higher number of small repurchases in my research sample. For large entities it is more difficult to increase EPS by a penny or more. But these entities can take advantage of high E/P ratios for other purposes. This might conclude that when the actual earnings are much higher than the earnings forecast, firms repurchase relatively more stock. To provide evidence on whether these firms repurchase stock and what the incentives are for these large firms, additional research is necessary.

Then, the descriptive statistics of my two repurchases samples present an increase of E/P ratio during the years. This increase could be an incentive for managers to repurchase stock. Thereby accretive repurchases have the highest percentage of total repurchases when the Treasury-bill rate (r) decreases from previous quarter (t). This will be the best moment (high E/P) to repurchase stock, because firms can take advantage of undervaluation or to meet or beat analysts EPS forecasts.

Remarkable is the decrease of percentage of shares repurchased to shares outstanding at the beginning of the quarter in sample 2. This can also be a result of low percentages of repurchases to the beginning of shares outstanding of huge entities, which repurchase higher dollar amounts compared to smaller companies.

Figure 2 illustrates the annual gradual increase of the total dollar amounts of repurchases until the credit crunch began (2008). This suggests that repurchases are only useful when firms have excess cash.

Despite the fact that the results of section 6.1 indicate that the sample of Hribar et al. (2006) has less accretive repurchases, there is evidence (figure 9.1 in section 6.3) that when I had used another weighted average such as $w=0,75$ in the ASIF_EPS equations, the magnitude of accretive repurchases of my first had been higher. My as-if equations underestimate the accretive and decreitive repurchases.

The results of the equation ASIF_EPS1 to all repurchases is quite obvious. The accretive repurchases (by ASIF_EPS1) of sample 1 (sample 2) are 17,49% (13,63%) of the total repurchase sample. The results of my first sample are comparable with Hribar et al. (2006)

Stock repurchases as an earnings management device

(17,6%). Hereby, I conclude that the level of accretive repurchases is at least increased in both samples, because the influence of repurchases are underestimated by my as-if equations.

Nevertheless the underestimation, the number of accretive repurchases (by ASIF_EPS2) in sample 1 increased by 57,6% from Hribar et al. (2006). This increase can be a result of the increased amounts used for repurchases and the lower Treasury-bill rate in last three year of sample 1. Thereby, I suggest that accretive repurchases become more relevant for repurchasing firms during 1997 to 2003.

In contrast to the accretive repurchases, the magnitude of decreitive stock repurchases in sample 1 decreased by 70.7% compared with Hribar et al. (2006). Maybe managers avoid EPS decreases by stop or postpone repurchases. When this happens, this explains the high magnitude of low repurchase amounts in the first and second repurchase sample.

Second, I will compare the outcomes of sample 2 with sample 1. Here, I find that the accretive repurchases decreased by 34,74%. The explanation is found in the high magnitude of low purchase amounts (descriptive statistics table 1.11) and the persistence of the credit crunch in the last two years of the sample (figure 2 section 5.4). Here the median is very low compared with sample 1 and the mean of sample 2. Moreover, the increase of huge entities can have negative influence on accretive repurchases. These entities need enormous amounts to increase EPS by even a penny.

At last, the decreitive repurchases of sample 2 decrease by 69,13% compared with sample 1. This trend is already been seen in my first sample. This might conclude that decreitive repurchases are better managed. Also the low Treasury-bill rates in 2000-2003 and 2008-2009 and the weighted effect of the repurchase will decrease the presence of decreitive stock repurchases.

The third topic of the data analyses are the outcomes described in section 6.2. First, I illustrate the normal distribution of repurchases around the pre-purchase forecast error bin. This is quite logical because analysts' forecast are made by professionals who know the business well. High proportions of earnings surprise are not usual in the U.S. market. But

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however figures 6.1 and 6.2 have both a normal distribution, it is remarkable that 6.2 has higher numbers of small negative and small positive forecast errors. This indicates to large numbers of undervalued shares and lower EPS number than expected. Firms are earlier intended to repurchase stock to meet or beat analysts forecasts or to take advantage of the undervaluation.

Second, I divided the number of repurchases into the 41 forecast error bins in figures 7.1 and 7.2. Both results present a normal distribution for the accretive and decreitive repurchases. These normal distributions are weaker than the normal distribution of all repurchases (figure 1 and 2). Moreover, it is remarkable that the normal distribution of both accretive and decreitive repurchases turn to the right of the symetric forecast error distribution. While the normal distribution of the accretive repurchases starts to steep around small negative pre-purchase forecast errors in figure 7.1 and 7.2. This indicates stock repurchases that are used to meet or beat quarterly analysts' EPS forecast.

The higher number of accretive and decreitive repurchases around the high positive forecast error bins indicates that stock repurchases are also intended by undervaluation or other motivations. Remarkable is the increase of these repurchase in sample 2. This can be explained by uncertain market conditions beause of the credit crunch (pessimitic share prices in 2008 and 2009).

The total amount of decreitive repurchases in the samples can be harmed by the enormous decrease of decreitive repurchases in sample 1 and 2 comparable to the research of Hribar et al. (2006). It is obvious that decreitive repurchases are remarkable low around small positive or small negative earnings surprises. This strengthens the suggestion that these repurchases are intended by earnings management.

The last figures of section 6.2 describe the relative frequency of accretive and decreitive repurchases of the 41 pre-purchase forecast error bins. The results of figures 8.1 and 8.2 are comparable with Hribar et al. (2006). The difference in percentages can be explained by the higher total sample of Hribar et al. (133,149 firm-quarter).

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The first sample counts 96.798 and the second sample 105.037 firm-quarters. Moreover, the quality of forecasting can also have a huge impact the pre-purchase forecast errors. The results of Hribar is comparable to both figure 8.1 as 8.2. The accretive repurchases are disproportional high for firms with small negative pre-purchase quarterly EPS forecasts and firms with high positive pre-purchase quarterly EPS forecasts. Despite, the distribution of figure 8.2 indicates that the credit crunch change the proportion of accretive and decretion repurchases around high negative earnings surprises. It might be that firms repurchase their stock to stablize share price or because of undervaluation of future earnings.

As already concluded by Hribar et al. (2006), “disproportional high accretive repurchases of firms by small negative pre-purchase quarterly EPS forecasts indicates to repurchases to meet or beat analysts EPS forecasts”. And the high proportion of accretive repurchases around high positive pre-purchase forecast errors indicates to undervaluation, cash flow signaling or employee stock option dilution motivations. These motives are also driven by high E/P ratios and is economicly attractive for firms (low share price/high earnings). Important is that motives to repurchase stock other than meeting or beating EPS forecast seems to be more relevant to managers.

The statistical significance in the relative frequency of both accretive stock repurchases samples is based on a bootstrapping procedure. Hereby I try to assess the likelihood that the results can be obtained by chance. The chance of wrong results is $p < 0,01$, because the 6.000 observations in the research. And because of the consistency of the high proportion of accretive repurchases in the small negative pre-purchase quarterly EPS forecasts bins compared with Hribar et al. (2006) (see Chapter ‘other figures Hribar et al. (2006)’ p.128), I accept the hypotheses “The level of accretive repurchases is disproportionately high for firms with small negative pre-repurchase quarterly EPS forecast errors”.

Despite the fact that repurchases probably face an increasing number of accretive repurchases in high positive pre-purchase forecast errors. H1 also counts for decretive repurchases in the small positive pre-purchase quarterly EPS forecasts, here I find a disproportional low magnitude of decretive repurchases in small positive earnings surprises. These observations also suggest earnings management by repurchases to meet or beat

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consensus analysts EPS forecast around small negative (or positive) pre-purchase quarterly EPS forecasts.

At last, the results of the robustness test suggest that repurchases of sample 1 with a weighted effect will increase the number of accretive repurchases significantly (35,7%). This also counts for sample 2 (31,4%). Meanwhile, when I take a weighted average of 0,25 for the repurchases, the number of accretive repurchases of sample 1 (sample 2) decreases with 61,8% (73%).

8 Conclusions

This research gives insight in the phenomenon of stock repurchases in the U.S. for a long time period. I observe a constant grow of annual repurchase amount (\$) from year 1997 to 2007. Then, the credit crunch has a huge influence on the annual amounts (\$) of repurchases in 2008 and 2009. Nevertheless, 2008 was the year with the percentage of accretive repurchases (annual accretive repurchases divided by annual repurchases). These repurchases seem to be better managed. This trend is also observable in sample 1 (year 2000). Remarkable is the fact that in both years the Treasury-bill rate falls and the E/P grow. This might indicates undervalued share prices, which is an opportunity for firms to improve EPS numbers. The number of accretive repurchases of both sample also increased compared to Hribar et al. (2006), while the decreitive repurchases decrease significantly. The descriptive statistics suggests that the amendments of rule 10b-18 (appendix IV regulation) increase the number of registered stock repurchases.

In total NYSE, AMEX and NASDAQ firms repurchase stock for an amount of \$1088 billion in the sample period from 1997 to 2003. This amount is increased by 99%¹⁹ to \$2641 billion in the sample period from 2004 to 2009, while the number of repurchase is constant. This indicates that stock repurchases become more important in firms' finance decisions. The increase is explained by observation of much large entities in the repurchase sample. The spread of the repurchases amounts seem to increase in the second research sample.

In both samples there is also a disproportional high number of accretive repurchases observable in small negative pre-purchase forecast error bins. The high number of observations of accretive repurchases in small positive pre-purchase forecast errors have statistical significance by the bootstrap method (Hribar et al., 2006). More than 6.000 observations conclude that the outcomes can not be obtained by chance ($p > 0,01$). Thereby the hypotheses H1 accepted, which means that "The level of accretive repurchases is disproportionately high for firms with small negative pre-repurchase quarterly EPS forecast errors". The conclusion of this master's thesis is that stock repurchases in small negative

¹⁹ Indexed see data analyses

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pre-purchase forecast errors bins are used as a earnings management device to meet or beat analysts' EPS forecast.

In both samples I also obtain a disproportional high number of accretive repurchase in high positive pre-purchase forecast error bins. This hypotheses is not been tested in this master's thesis. The high number accretive repurchase in high positive pre-purchase forecast error bin can be explained by the increased E/P ratios. It suggests structural undervaluation in these samples. Moreover, it seems that the disproportional high number of accretive repurchase in high positive pre-purchase forecast error bins increases from 2004-2009. The credit crunch can be the source for the undervaluation (huge stock price decreases).

At last, I found that timing of the repurchases is significant for the results of this research. When firms repurchase at the end of the period, the repurchase will not increase by a penny in most cases. Contrast, the accretive repurchases will be much higher when the transaction timing is at the beginning of current quarter. This means that the conclusions of EPS management to meet or beat consensus analysts' EPS forecasts by repurchases depends on the timing of these repurchases. When the repurchases are well managed the number of EPS increases in the small negative pre-purchase forecast error bins will be much higher, and otherwise.

9 Recommendations for additional research

This research was extensive and time consuming, so I chose not to investigate the impact of repurchases on stock prices. In the future this impact can be investigated following Hribar et al. (2006). The dollar amounts spent on repurchases declined in the last years of sample 2. This is due to the credit crunch that begins in 2008. I predict an increase of repurchases in 2010 because of the low share-prices in many indexes and the low Treasury-bill rate. Excess cash is not profitable when you deposit it into a Treasury-bill. Maybe excess cash will be earlier an expenditure to stock repurchases in 2010.

Another topic for additional research can be 'What are the reasons for increasing magnitude of huge entities under the repurchasing firms?'. Thereafter it is possible to do a field study to the relation E/P ratio and the Treasury-bill rate to repurchases. In this way it is possible to discover the relation between these market items. At last, it is possible to investigate the magnitude of accretive repurchases around the high positive pre-purchase forecast errors. Here, you can make a selection of high positive forecast errors from the IBES database and do a field study to managerial motives of the purchases.

Appendix I Treasury bill-rates

In this appendix I present the quarterly Treasury-bill rate for my research. “Treasury bills are short-term government securities with maturities ranging from a few days to 52 weeks. Bills are sold at a discount from their face value” (Treasury direct, 2010). This data is collected from the Federal Reserve Statistical Releases (FEB) website (see links in the Chapter References’). The FED describes the rates as “U.S. Treasury-bill rates for non-inflation indexed Treasury securities”. I provide the collected data in table 23. The rates are calculated from composites of quotations obtained by the Federal Reserve Bank of New York. The data is based on yearly interest, using a 360-day year and transformed into the yearly interest for particular quarters. To use it as tool to compute the opportunity costs I have to transform it to a weighted average of the quarter. These rates are the yearly Treasury bill-rates per quarter:

Table 23 Treasury-bill rates from the third quarter of 1996 to the 4th quarter of 2009

1996	Q3	5,52%	2003	Q2	1,95%
1996	Q4	5,50%	2003	Q3	2,47%
1997	Q1	5,53%	2003	Q4	2,94%
1997	Q2	4,86%	2004	Q1	3,46%
1997	Q3	4,73%	2004	Q2	3,98%
1997	Q4	4,75%	2004	Q3	4,46%
1998	Q1	5,09%	2004	Q4	4,91%
1998	Q2	5,31%	2005	Q1	5,25%
1998	Q3	5,68%	2005	Q2	5,25%
1998	Q4	6,27%	2005	Q3	3,46%
1999	Q1	6,52%	2005	Q4	3,98%
1999	Q2	6,47%	2006	Q1	4,46%
1999	Q3	5,59%	2006	Q2	4,91%
1999	Q4	4,33%	2006	Q3	5,25%
2000	Q1	3,50%	2006	Q4	5,25%
2000	Q4	2,13%	2007	Q1	5,26%
2000	Q1	1,73%	2007	Q2	5,25%
2000	Q4	1,75%	2007	Q3	5,07%
2001	Q1	1,74%	2007	Q4	4,49%
2001	Q2	1,44%	2008	Q1	3,18%
2001	Q3	1,25%	2008	Q2	2,09%
2001	Q4	1,25%	2008	Q3	1,94%
2002	Q1	1,02%	2008	Q4	0,51%
2002	Q2	1,00%	2009	Q1	0,18%
2002	Q3	1,00%	2009	Q2	0,18%
2002	Q4	1,01%	2009	Q3	0,16%
2003	Q1	1,43%	2009	Q4	0,12%

Appendix II Industry codes

The general industry codes (GIC) are an important variable to eliminate firms. In section 5.1 “sample selection” I state that utilities, financial institutions, and transportation firms will be eliminated from the samples. This results in the elimination of firms with the underlying GIC codes. I implement the description of the classification of GIC codes.

<u>Name sector</u>	<u>GIC</u>
Utilities	40
Transportation firms	2030
Financial institutional firms	55

The residually firms belong to the samples. The sectors GIC equal the underlying specific industry codes (SIC) codes. Some SIC are globally summarized and so double counted.

<u>Name sector</u>	<u>SIC</u>
Agriculture	0100-0299, 0700-0799, 0910-0919 and 2048-2048
Food Products	2000-2099
Soda Candy & Soda	2064-2097
Beer & Liquor	2080-2085
Tobacco Products	2100-2199
Toys Recreation	0920-0999
Fishing, hunting & trapping	3650-3652, 3732, 3930-3931 and 3940-3949
Entertainment	7800-7999
Books, Printing and Publishing	2700-2799
Consumer Goods	2047, 2391, 2392, 2510-2599, 2840-3995
Apparel	2300-2390, 3020-3965
Healthcare	8000-8099
Medical Equipment	3693-3851
Pharmaceutical Products	2830-2836
Chemicals	2800-2899
Rubber and Plastic Products	3031-3099
Textiles	2200-2399
Construction Materials	0800-0899, 2400-2952, 3200-3996
Construction	1500-1799
Steel Works Etc	3300-3399

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Fabricated Products	3400-3479
Machinery	3510-3599
Electrical Equipment	3600-3699
Automobiles and Trucks	2296-3799
Aircraft	3720-3729
Shipbuilding, Railroad Equipment	3730-3743
Defence	3760-3769, 3795, and 3480-3489
Precious Metals	1040-1049
Non-Metallic and Industrial Metal Mining	1000-1499
Coal	1200-1299
Oil, Petroleum and Natural Gas	1300-1389, 2900-2912, 2990-2999
Personal Services	7020-7641, 7690-7699, 8100-8899, and 7510-7515
Business Services	2750-2759, 3993, 7218, 7300-7399, 7519, 8700-8748, 8900-8999, and 4220-4229
Computers	3570-3579, 3680-3695, 7373
Chips and Electronic Equipment	3622, 3661-3679, 3810-3839
Paper and Business Supplies	2520-2549, 2600-2639, 2670-2699, 2760-2761, and 3950-3955
Boxes Shipping Containers	2440-2449, 2640-2659, 3220-3221, and 3410-3412
Restaurants, Hotels, and Motels	7000 - 7213
Others	4950- 4961, 4970-4971, and 4990-4991

The underlying SIC-codes get a special treatment because they have a different level of excess cash.

Wholesale	5000-5199
Retail	5000-5999

Appendix III Literature overview

Author(s)	Topic(s)	Method(s)	Population	Outcomes
Section 4.1 Stock repurchases to meet or beat EPS purposes				
Hribar, R., N. T. Jenkins and W.B. Johnson (2006)	"Stock repurchases as an Earnings Management device"	Hribar et al. describe the conditions for accretive/ decreative stock repurchases. These estimates will be used for the research to the phenomenon of abnormal numbers of accretive stock repurchases around small negative earnings surprise bin (pre-purchase). Later, they explore the CAR3 regression to discover the reaction of investors when stock repurchases will affect EPS.	The sample includes U.S. firms listed on the NYSE, AMEX and NASDAQ. The samples yield 133,149 firm-quarters observations and 26,480 firm-quarters observations with stock repurchases.	The result of their research was a higher than expected proportion of firms that use accretive stock repurchases when they would otherwise fall just short of the EPS forecast benchmark. The opposite effect was shown for accretive repurchases. This could be a form of earnings management. Many of these stock repurchases are likely to be unrelated to EPS management. Their results also show that investors value the repurchase-induced EPS surprises separate from the total earnings surprise. And there is a difference in valuation of the repurchase-induced earnings surprise when stock repurchases are likely to be used to meet or beat analysts' forecasts.
Daniel A. Bens, Venky Nagar and M.H. Franco Wong (2003).	Employee stock options, EPS dilution and stock repurchases	The same as Hribar et al., they describe the conditions under which stock repurchases are accretive/ decreative. The desired level of EPS growth is an important incentive for managers. The question is whether repurchase will increase the EPS and what the motives are for the repurchase. Stock repurchases are also related to firms' P/E ratio and how the repurchase is financed.	They focus on Standard & Poor 500 Industrial firms for the years 1996-1999. In this sample they eliminate utilities, financial and transportation firms, yearly and hand-collected information.	They "find that managers increase stock repurchases when firm face dilutive effects of ESOs. They also manage their stock repurchases when earnings are below firms' desired rate of EPS growth"
David Lacker (2003)	Discussion paper on article of Bens et al. (2003)	Not applicable	Not applicable	Model of Bens only focus on the long-term decisions, while meeting or beating EPS targets are more short-term decisions. Moreover, short-term effects of analysts' forecasts are more important for managers than historical EPS growth. Thereafter he argued that the influence of high P/E ratios is important for managerial decisions.
Wayne Guay (2002)	Discussion paper on article of Bens et al. (2003)	Not applicable	Not applicable	Guay states that Bens et al. hypothesize tenuous or incorrect because it is not clear that stock option plans dilute EPS or that stock repurchases effectively increase EPS. Guay also pay attention to opportunity costs of cash. Moreover, stock repurchases also face potential economic hypotheses that support a relation between stock option plans and payout choice, which is underexposed in the research of Bens et al. (2003).

Author(s)	Topic(s)	Method(s)	Population	Outcomes
Section 4.2 Managerial behaviour and stock repurchases				
John R. Graham, Campbell R. Harvey, and Shiva Rajgopal (2005)	Name: "The economic implications of corporate financial reporting" Their objective is to "determine the factors that drive reported earnings and disclosure decisions"	Survey and interviews	More than 400 managers, from firms listed on NASDAQ, AMEX, NYSE and some private firms	Managers often took decisions that have negative long-term consequences to EPS, only to boost their short term earnings. Near 78% of the managers admit to sacrifice long-term value to smooth EPS in the survey.
Alon Brav, John R. Graham, Campbell R. Harvey and Roni Michaely (2005)	Name: Payout policy in the 21st century Their objective is to replicate and extend prior research to dividend policies for the 21th century. They try to find how dividend and repurchase policies are currently determined".	Survey and in-depth interviews	384 financial executives and conduct in-depth interviews with an additional 23 executives.	Near 76% of survey respondents response "to improve EPS" numbers as reason for stock repurchases. This indicates that they are likely to increasing earnings per share (EPS) with stock repurchases. This factor is thus probably affecting their share repurchase decisions. They also express their great concerns about the effects of repurchases on EPS.

Stock repurchases as an earnings management device

Author(s)	Topic(s)	Method(s)	Population	Outcomes
Section 4.3 Earnings and analysts' forecasts				
Athanasakou, Strong and Walker (2009)	Earnings management or forecast guidance to meet analyst expectations.	They test UK firms for accrual management, classification shifting or earnings forecast guidance to meet analyst expectations. They use accrual models and make their own proxy.	All UK listed firms excl. financial firms from DataStream for the period 1994-2002	Their results suggest that UK firms choose for applying earnings management by earnings forecast guidance or in classification shifting rather instead of accruals management. This earnings management is applied to avoid negative earnings surprises.
Hribar, R., N. T. Jenkins and W.B. Johnson (2006)	EPS management when firms would have missed their analysts' forecasts.	ASIF_EPS2, estimate to compute pre-purchase EPS, pre-purchase minus consensus (quarterly) EPS (= earnings surprise or forecast error).	U.S. firms listed on the NYSE, AMEX and NASDAQ.	Abnormal high presence of accretive stock repurchases at small negative earnings surprises bins and abnormal high absence of decreative stock repurchase at small positive earnings surprises bins.
Scott Richardson, Siew Hong Teoh, Peter D. Wysocki (2004)	The walk down to beatable analyst forecasts: The roles of equity issuance and insider trading incentives	They investigate allegations by security regulators and the business press that firms and analysts are involved in an "earnings-guidance game". They distinguish forecasts in twelve subsections(months) and analyze if the vision of analysts is changed during the year(s)	IB/E/S individual analysts forecasts of annual earnings from 1983-1998	The rarest finding is that, during the 1990's, analysts issue "systematically optimistic forecasts early in the fiscal year followed by systematically pessimistic forecasts as the earnings announcement approaches". They also find evidence that suggests "that managers opportunistically guide analysts' expectations around earnings announcements to facilitate favorable insider trades after earnings announcements".

Author(s)	Topic(s)	Method(s)	Population	Outcomes
Section 4.3 Earnings and analysts' forecasts				
Skinner and Sloan (2002)	Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio.	Capital market research with indicator variables for missing or meeting analysts forecast, linked with stock price respond. With an event study they try to find the stock response for specific earnings announcement date.	Firms that have data available on IBES and CRSP from 1984 till 1996. Total sample of 103,274 realized quarterly earnings	Firms are likely to manage "small negative earnings surprise to small positive earnings surprise, because the large negative price response of shares when firms face negative earnings surprises".
Kaszniak and McNichols (2002)	Does Meeting Earnings Expectations Matter? Evidence from Analyst Forecast Revisions and Share Prices.	The method they used is comparing all actual EPS (yearly) with the analysts forecast. Then, they give all firms' that meet the forecast an indicator variable (called MEET). This done for three years. Then the stock response is matched with these firm samples. For firms that meet none of the years to firms those consistently meet the forecast.	All firms from 1986-1993 in the 1996 Compustat Merged Database with data of forecast one year and two years ahead on IBES.	The results provide evidence that "abnormal annual returns are significantly higher for firms that meet their earnings expectations (constantly)". Thereby they find "that firms which meet their expectations have significantly higher future earnings forecasts".
Bartov, E., D. Givoly and C. Hayn. 2002.	The rewards to meeting or beating earnings expectations, Relation between earnings management and unexpected earnings and the market response on the unexpected earnings	Capital market information, actual EPS minus consensus forecasts ranked in different ranges. These ranks are compared with the MBA (market premium)	The final sample includes 130,000 quarterly earnings forecasts made between 1983 and 1997 and incorporates approximately 65,000 firm-quarters. The info is from Thomas/First Call (I/B/E/S) database of analysts' forecasts, and the database of CRSP	The results of this research indicates that "firms which meet or beat current analysts' earnings expectations have higher returns over their quarters than firms with similar quarterly earnings forecast errors that fail to meet these expectations". They also found that stock price return of a firm is significantly lower, when a firm uses earnings management (accrual management in this research) to meet or beat these forecasts. But they also find that the most negative stock price return occurs, when firms do not use earnings management and miss their forecasts.

Stock repurchases as an earnings management device

Author(s)	Topic(s)	Method(s)	Population	Outcomes
Section 4.4 The phenomenon stock repurchases				
Gustavo Grullon and David L Ikenberry (2000)	What do we know about stock repurchases	Literature review	Period that spans 1980-1999, collected literature on stock repurchases	Information about regulatory issues that face stock repurchases, absolute amounts of stock repurchases, motives to repurchase stock, trend in repurchase announcements, capital market and stock repurchases, and stock repurchases caused by firms' undervaluation.
Theo Vermaelen (2005)	Stock repurchases	Literature review, informative approach	Five ways to repurchase stock, explanation of different ways to repurchase stock. They also give examples of the five ways to repurchase stock. I do not found a population or sample.	
Gustavo Grullon and Roni Michaely (2004)	The Information Content of Share Repurchase Programs	They define the CAR3, and then make a multiple regression of systematic risk and future profitability. Define saturated markets and compare the two samples. At least the try to find explanations for stock repurchases, by making a model with the capital expenditures, R&D expenses and cash reserves.	Open-market share repurchase programs from two sources. These selection criteria create a sample of 4,443 open-market share repurchase announcements for the period 1980 to 1997.	The conclusions of this research are: that "repurchasing firms experience a significant reduction in systematic risk and cost of capital relative to non-repurchasing firms". -"the market reaction to share repurchase announcements is more positive among those firms that are more likely to overinvest (saturated markets, opportunistic markets etc.)" -"evidence to indicate that investors under react to repurchase announcements because they initially underestimate the decline in cost of capital".
Theo Bettenhausen (2008)	Managing Earnings per share through stock repurchases	The replicate the approach of Bens et al. (2003) to a European sample. They identify the accretive/ decreative repurchase conditions. They also try to find the relation between stock repurchases and the increase the EPS (historical) and to mitigate the diluted effect of ESOs. Also the relation between firms' P/E ratio and how the repurchase is financed are investigated.	Firms listed on the AEX, CAC-40 and FTSE-100. Initially all 161 firms listed on those indices on January 1st 2008 were selected.	He finds "that firms use stock repurchases to achieve a certain diluted EPS growth rate. And when firms falling behind their EPS target, they decide to repurchase stock. He concludes that firms use stock repurchases to increase diluted EPS, in an attempt to reach EPS targets".

Author(s)	Topic(s)	Method(s)	Population	Outcomes
Section 4.5 Timing of the repurchase				
Zahn Bozanic (2009)	Managerial motivation and timing of open market share repurchases	two regressions for the motivation of stock repurchases and one regression for the transaction timing of stock repurchases	This research includes publicly-traded firms conducting open-market stock repurchases during the period 2004–2006, this sample result to 1,047 firms with in total 7,188 monthly repurchase events.	The paper provides evidence about the fact that firms which make repurchases time their repurchases to perceived undervaluation. These firms also face discretionary cash flows. Another outcome is that firms in competitive industries repurchase less stock. Stock repurchases can also be a substitute for anti-takeover provisions, and at last that firms attempt to manage earnings upward through the use of repurchases.
Edith Ginglinger, Jacques Hamon (2003)	Shares repurchase regulations: Do firms play by the rules?	the maximum percentage capital allowed for repurchases, and the maximum repurchase price compared with the dataset (transaction prices, volumes, and the best limits of the order book)	This research incorporates 36,848 repurchases made by 352 French firms over the period 2000–2002 dataset contains a time-stamped record of every transaction and order submitted to the market from January 2000 to December 2002.	They find "that very few firms fully comply with the regulations for all their stock repurchases". And that "illegal repurchases before earnings announcements are the most detrimental to selling shareholders".

Stock repurchases as an earnings management device

Author(s)	Topic(s)	Method(s)	Population	Outcomes
Section 4.6 Investors' response on stock repurchases				
DeFond and Park (2001)	Abnormal Accruals and Valuation of Earnings Surprises	Accrual measures and a proxy that includes for the difference of realized working capital and expected working capital in the price response models to measure the valuation of the earnings surprise.	14,389 firm quarter's earnings announcements in the time period 1992 through 1995 from the First Call Historical Data	"The reported magnitude of earnings surprises that contains abnormal accruals will differ from the underlying magnitude that is priced by the market"
Bartov, E., D. Givoly and C. Hayn. 2002.	The rewards to meeting or beating earnings expectations, Relation between earnings management and unexpected earnings and the market response on the unexpected earnings	Capital market information, actual EPS minus consensus forecasts ranked in different ranges. These ranks compared with MBA (market premium)	January 1983 to December 1997, Thomas/ First Call (I/B/E/S) database of analysts' forecasts. And data of earliest forecast and latest forecast available. The total number of firm-quarters in the final sample is 64,872.	The results of this research indicates that "firms which meet or beat current analysts' earnings expectations have higher returns over their quarters than firms with similar quarterly earnings forecast errors that fail to meet these expectations". They also found that stock price return of a firm is significantly lower, when a firm uses earnings management (accrual management in this research) to meet or beat these forecasts. But they also find that the most negative stock price return occurs, when firms do not use earnings management and miss their forecasts.
Hribar, R., N. T. Jenkins and W.B. Johnson (2006)	Stock repurchases as an earnings management device	Multiple-regression to discover the stock return response on different variables. Many variables are dummy and related to stock repurchases by prior researches.	U.S. firms listed on the NYSE, AMEX and NASDAQ. Their selection process yields an overall sample of 133,149 firm-quarters	They find that investors "devalue the earnings surprise caused by stock repurchases related to earnings management".

Author(s)	Topic(s)	Population	Method(s)	Outcomes
Section 4.7 Other relevant literature				
Tim Koller, Marcus Henricus Goedhart, and David Wessels	Valuation; measuring and managing the value of companies Topic: Excess cash as a percentage of assets (cash ratio)	S&P500 non-financial companies in the time period of 1993 to 2000.	Statistical research to the behaviour of the cash holding and make a proxy for excess cash.	All other firms with a cash-to-sales ratio above 2% will be counted as excess cash. For firms with volatile cashflows and cash paid revenues will face higher excess cashflow levels.
Chan, Ikenberry, Lee and Wang (2007)	Share Repurchases as a Tool to Mislead Investors: Evidence from Earnings Quality and Stock Performance	They form a sample of open-market repurchase announcements from two sources. The first is from the Wall Street Journal Index for the period 1980-1990; the second is from Securities Data Corporation which begins comprehensive coverage in 1985. This sample includes all firms listed on the NYSE/AMEX/NASDAQ stock.	They follow convention in the EM literature and decompose accruals using the Jones model. This to discover EM when the repurchase announcement is made.	Their main findings are that "the market react positively to the announcement of open market share repurchases and that these assumptions afford the possibility that some programs may be designed to manipulate investor opinion".
Balachandran, Chalmers and Haman (2007)	On-market share buybacks, exercisable share options and earnings management	445 ASX on-market buybacks during the period 1996-2003 (not financial services, energy or utility industries)	They analyze EM from 2 years prior to 1 year post the buyback announcement year using a variation of the cross-sectional modified Jones model. They use discretionary current accruals as their measure of EM. They also "examine the association between EM and exercisable option holdings for buyback firms to investigate if EM in the pre-buyback period is greater for firms with equity incentives to increase share price".	"Their findings suggest that EM patterns in the pre-buyback period differ for firms whether the firm has options that are exercisable in the buyback period. They also find some evidence for managers using EM and announcement of buybacks to maximize their option payoff for firms with out-of-the-money options prior to buyback announcements."

Appendix IV Regulation

Rule 10b-18

Amendment of Rule 10b-18 includes disclosure of table 24 for firm quarterly financial statements.

(a) In the following tabular format, provide the information specified in paragraph (b) of this Item with respect to any purchase made by or on behalf of the issuer or any “affiliated purchaser,” as defined in §240.10b-18(a)(3) of this chapter, of shares or other units of any class of the issuer's equity securities that is registered by the issuer pursuant to section 12 of the Exchange Act (15 U.S.C. 78 1).

Table 24

Period	(a) Total number of shares (or units) purchased	(b) Average price paid per share (or unit)	(c) Total number of shares (or units) purchased as part of publicly announced plans or programs	(d) Maximum number (or approximate dollar value) of shares (or units) that may yet be purchased under the plans or programs
Month #1 (identify beginning and ending dates)				
Month #2 (identify beginning and ending dates)				
Month #3 (identify beginning and ending dates)				
Total				

(b) The table shall include the following information for each class or series of securities for each month included in the period covered by the report:

(1) The total number of shares (or units) purchased (column (a));

Instruction to paragraph (b)(1) of Item 703: Include in this column all issuer repurchases, including those made pursuant to publicly announced plans or programs and those not made pursuant to publicly announced plans or programs. Briefly disclose, by footnote to the table, the number of shares purchased other than through a publicly announced plan or program and the nature of the transaction (e.g., whether the purchases were made in open-market transactions, tender offers, in satisfaction of the company's obligations upon exercise of outstanding put options issued by the company, or other transactions).

(2) The average price paid per share (or unit) (column (b));

(3) The total number of shares (or units) purchased as part of publicly announced repurchase plans or programs (column (c)); and

(4) The maximum number (or approximate dollar value) of shares (or units) that may yet be purchased under the plans or programs (column (d)).

Stock repurchases as an earnings management device

Instructions to paragraphs (b)(3) and (b)(4) of Item 703: 1. In the table, disclose this information in the aggregate for all plans or programs publicly announced.

2. By footnote to the table, indicate:

- a. The date each plan or program was announced;
- b. The dollar amount (or share or unit amount) approved;
- c. The expiration date (if any) of each plan or program;
- d. Each plan or program that has expired during the period covered by the table; and
- e. Each plan or program the issuer has determined to terminate prior to expiration, or under which the issuer does not intend to make further purchases.

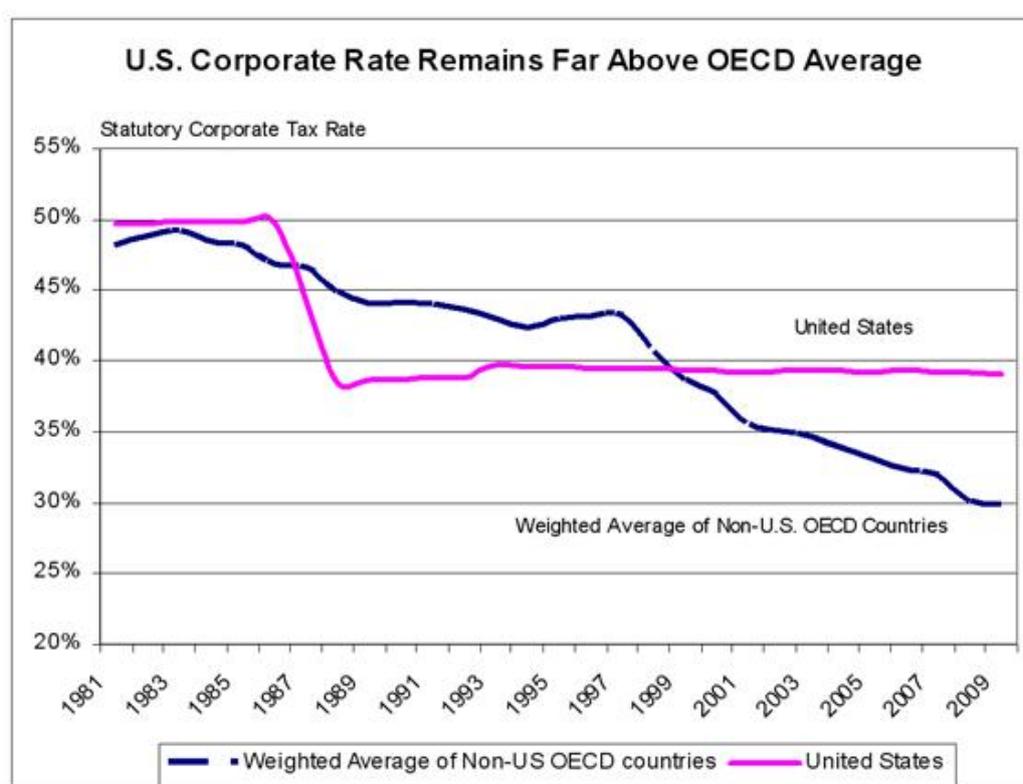
Instruction to Item 703: Disclose all purchases covered by this Item, including purchases that do not satisfy the conditions of the safe harbor of §240.10b-18 of this chapter.

[68 FR 64969, Nov. 17, 2003]

Appendix V Statutory tax rate

I take this figure for the estimate of firms' statutory tax rate. The statutory tax rate from 1997 to 2009 is approximate 38%. This is the estimate used to compute the after-tax opportunity costs.

Figure 12 U.S. Statutory Tax rate



Andre Dammert and Scott A. Hodge, U.S. Lags while Competitors Accelerate Corporate Income Tax Reform, 2009.

Appendix VI Purchase of Stock (PRSTCY)

PRSTKY Cash Flow Year-to-Date Number Millions

This item represents any use of funds which decreases common and/or preferred stock.

This item includes:

1. Conversion of Class A, Class B, special stock, and others, into Common/Ordinary Stock (Capital)
2. Conversion of preferred stock into Common/Ordinary Stock (Capital)
3. Purchase of treasury stock
4. Retirement or redemption of common/ordinary stock
5. Retirement or redemption of preferred stock
6. Retirement or redemption of redeemable preferred stock

This item excludes:

1. Purchase of warrants
2. Reduction in stocks of a subsidiary

This item contains a Combined Figure data code when:

1. Sale of Common and Preferred Stock is reported net of purchase
2. Purchase of Common and Preferred Stock is combined with another item on a Working Capital Statement (Format Code = 1), a Cash by Source and Use of Funds Statement (Format Code = 2), or a Cash Statement by Activity (Format Code = 3)

(Computat, 2010)

Reference list

Literature

- Athanasakou, V.E., N. C. Strong, M. Walker. 2009. Earnings management or forecast guidance to meet analyst expectations? *Accounting and Business Research*, Vol. 39, pp. 3-35.
- Badrinath, S.G., N.P. Varaiya and R.L. Ferling. 2001. To buy or not to buy. *Financial Executive*, Vol. 21, pp. 43-48.
- Bagwell, L.S. (1991). Share repurchase and takeover deterrence. *The RAND Journal of economics*, Vol. 22, pp. 72-88.
- Balachandran, B., K. Chalmers and J. Haman. 2007. On-market share buybacks, exercisable share options and earnings management. *Accounting & Finance*, Vol. 48, pp. 25-49.
- Barth, M.E. and R. Kaznik. 1999. Stock repurchases and intangible assets. *Journal of Accounting and Economics*, Vol. 28, pp. 211-241.
- Bartov, E., D. Givoly and C. Hayn. 2002. The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics*. Vol. 33, pp. 173-204.
- Bens, D.A., V. Nagar and M.H. Franco Wong. 2001. Real investment implications of employee stock option exercises. *Journal of Accounting Research*, Vol. 40, pp. 359-393.
- Bens, D.A., V. Nagar, D.J. Skinner and M.H. Franco Wong. 2003. Employee stock options, EPS dilution and stock repurchases. *Journal of Accounting and Economics*, Vol. 36, pp. 51-90.
- Bettenhausen, T. 2008. Managing Earnings per share through stock repurchases. Master's thesis, Erasmus University.
- Bozanic, Z. (2009). Managerial motivation and timing of open market share Repurchases. *RQFA (2010)*, Vol. 34, pp. 517-531.
- Burgstahler, D and M. Eames. 1998. Management of earnings and analyst forecasts. *Journal of Business Finance & Accounting*, Vol. 33, 633-652.
- Burgstahler, D. and I. Dichev. 1997. Earnings management to avoid earnings decreases and losses. *Journal of accounting and economics*, Vol. 24, pp. 99-126.
- Chan, K., D. L. Ikenberry, I. Lee, Y. Wang. 2007. Stock repurchases as a Tool to Mislead Investors: Evidence from Earnings Quality and Stock Performance. *Journal of Financial and Quantitative analyses*, Vol. 39, pp. 461-479.
- Koller, T., M. H. Goedhart; D. Wessels (2005). *Valuation : measuring and managing the value of companies*. McKinsey & Company, pp. 171-199.

Stock repurchases as an earnings management device

- DeFond, M.L., and Park C.W. 2001, The reversal of abnormal accruals and the market valuation of earnings surprises. *The Accounting Review*, Vol. 76, pp. 375.
- Dittmar, A.K. 2000, Why do firms repurchase stock? *The Journal of Business*, Vol. 73, pp. 331-355.
- Fenn, G.W. and N. Liang. 2001. Corporate payout policy and managerial stock incentives. *Journal of Financial Economics*, Vol. 60, pp. 45-72.
- Ginglinger, E. and Hamon, J. 2009. Share repurchase regulations: Do firms play by the rules? *International Review of Law and Economics*, Vol. 29 (2009) pp. 81–96
- Grullon, G. and R. Michaely 2004. The information content of share repurchase programs. *The journal of finance*, Vol. 59, pp. 651-680.
- Guay, W. 2002. Discussion of real investment implications of employee stock option exercises. *Journal of Accounting Research*, Vol. 40, pp. 395-406.
- Healy, P. M. and K. G. Palepu. 1990. Earnings and Risk Changes Surrounding Primary Stock Offers. *Journal of Accounting Research*, Vol. 28, pp. 25-55.
- Healy, P.M. and J.M. Wahlen. 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, Vol. 13, pp. 365-383.
- Hribar, P. N.T. Jenkins and W.B. Johnson (2004), Stock repurchases as an earnings management device, working paper.
- Hribar, P. N.T. Jenkins and W.B. Johnson (2006), Stock repurchases as an earnings management device, *Journal of Accounting and Economics*, Vol. 41, pp. 1017-1053.
- Ikenberry, D., J. Lakonishok and T. Vermaelen. 1995. Market underreaction to open market share repurchases. *Journal of Financial Economics* 39, 181-208.
- Ikenberry, D., J. Lakonishok and T. Vermaelen. 2000. Stock repurchases in Canada: Performance and Strategic Trading. *Journal of Finance* Volume 5, 2373-2397.
- Jagannathan, M. and C.P. Stephens. 2003, Motives for multiple open-market repurchase programs, *Financial Management*, Vol. 32, pp. 71-91.
- Jennings, R., M.J. LeClere and R.B. Thompson (1997), Evidence on the usefulness of Alternative Earnings per share measures, *Financial Analysts Journal*, Vol. Nov, pp. 24-33.
- Jensen, M. (2005) Agency costs of overvalued equity. *Financial Management*, Vol. 34, pp. 5-19.
- Jensen, M.C. and W.H. Meckling (1976), Theory of the firm: managerial behaviour, agency costs and ownership structure, *Journal of financial economics*, Vol. 3, pp. 306-360.

Stock repurchases as an earnings management device

- Kahle, K.M. 2002. When a repurchase isn't a buyback: open market repurchases and employee options. *Journal of Financial Economics*, Vol. 63, 235-261.
- Kaszniak, R. and M.F. McNichols. 2002. Does meeting Earnings Expectations Matter? Evidence from Analysts Forecast Revisions and Share Prices. *Journal of Accounting Research*, Vol. 40, pp. 727-759.
- Larcker, D. F. (2003), Discussion of employee stock options, EPS dilution, and stock repurchases, *Journal of Accounting and Economics*, Vol. 36, pp. 45-49.
- Leahey, A.L. and R.A. Zimmerman (2007), A road map for share-based compensation, *Journal of Accountancy*, vol. 203, pp. 50-54.
- Lee, C-H and P. Alam. 2004. Stock Option Measures and the Stock Repurchase Decision. *Review of Quantitative Finance and Accounting*, pp. 329-352.
- Martani, D, K. Mulyono, R. Khairurizka, 2009. The effect of financial ratios, firm size and cash flow from operating activities in the interim report to the stock return, *Chinese Business Review*, Vol. 8 pp. 44-55
- McIntyre, R. and T.D. Co Nguyen *Multinational Monitor*, Vol. 25, No. 11
- Myers J.N., L.A. Myers. And D. J. Skinner. 2002. Earnings momentum and earnings management. Working Paper. University of Illinois and University of Michigan.
- Nohel, T. and V. Tarhan. 1998. Stock repurchases and firm performance: new evidence on the agency costs of free cash flow. *Journal of Financial Economics*, Vol. 49, pp. 187-222.
- Opler, T. and S. Sheridan (1998), The debt-equity choice: An analysis of issuing firms. Working paper, Columbus Ohio State University.
- Palepu, Healy, Bernard, Peek, *Business Analyses and Valuation IFRS Edition Thompson*, 2007
- Peasnell, K.V., P.F. Pope and S. Young (2000), Detecting earnings management using cross-sectional abnormal accruals models. *Accounting and Business Review*, Vol. 30, pp. 313-326.
- Rajan, Madhav V. and Richard E. Saouma, 2006. Optimal Information Asymmetry. *The Accounting Review*, Vol. 81, pp. 677
- Richardson, S.A., S. H. Teoh, and P. D. Wysocki. 2001. The walkdown to beatable analyst forecasts: the roles of equity issuance and insider trading incentives. *Contemporary Accounting Research*, Vol. 21, pp. 885-924
- Santen, G.M. van (2004), Winst per aandeel, in: *Externe Verslaggeving in theorie en praktijk*, edited by M.N. Hoogendoorn, J. Klaassen and F. Krens, pp. 48-72.
- Schipper, K. 1989. Commentary on earnings management. *Accounting Horizons*, Vol. 3, pp. 91-102.

Stock repurchases as an earnings management device

Skinner, D.J. and R.G. Sloan. 2002. Earnings Surprises, Growth Expectations, and Stock Returns or Don't Let an Earnings Torpedo Sink Your Portfolio *Review of Accounting Studies*, Vol. 7, pp. 289-312

Stephens, C.P. and M.J. Weisbach 1998. Actual share reacquisitions in open-market repurchase programs. *Journal of Finance*, Vol. 53, pp. 313-334.

Vafeas, N., A.Vlittis, P. Katranis and K.Ockree 2003. Earnings management around share repurchases. *ABACUS*, Vol. 39, pp. 262-272.

Vermaelen, T. (1981), Common stock repurchases and market signalling: An empirical study. *Journal of Financial Economics*, Vol. 9, pp. 139-283.

Vermaelen, T. 1984. Repurchase Tender Offers, Signaling, and Managerial incentives. *Journal of Financial and Quantitative Analyses*, Vol. 19, pp. 153-178.

Vermaelen, T. 2005. Stock Repurchases. *Foundations and Trends in Finance*, Vol. 1, pp. 171–268.

Websites

Federal Reserve Statistical Release website:

<http://www.federalreserve.gov/releases/h15/update/>

U.S. Department of the Treasury

<http://www.treas.gov/>

SEC website:

www.sec.gov/

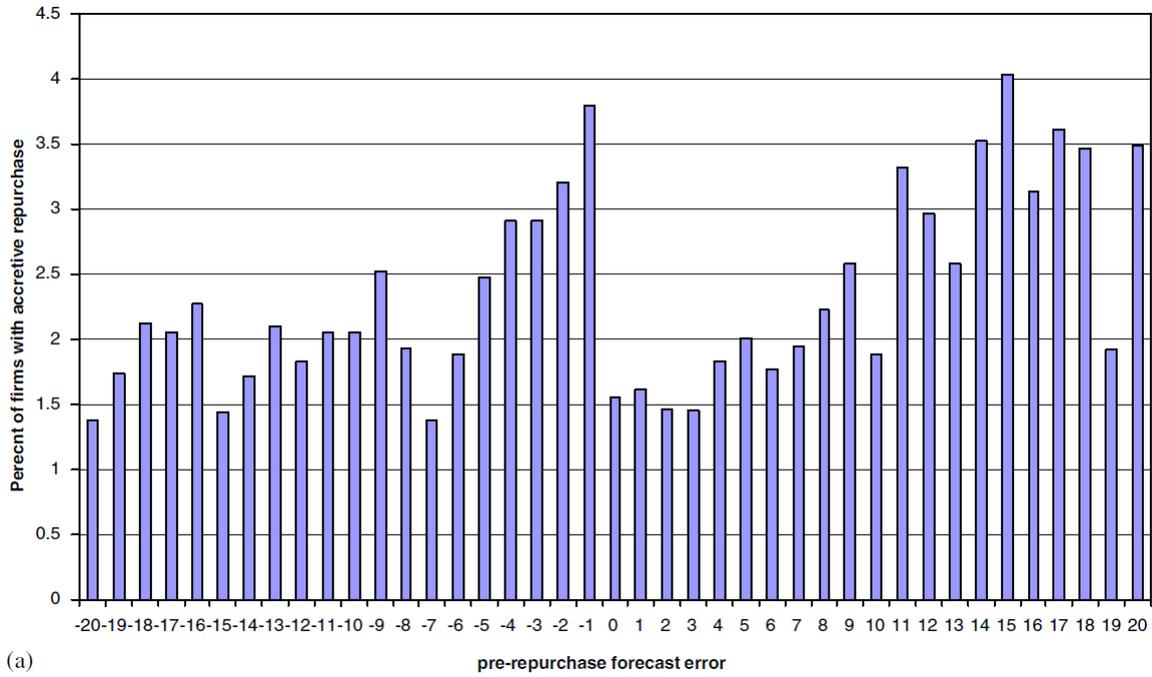
Marginal tax rate:

<http://www.taxfoundation.org/research/show/24973.html>

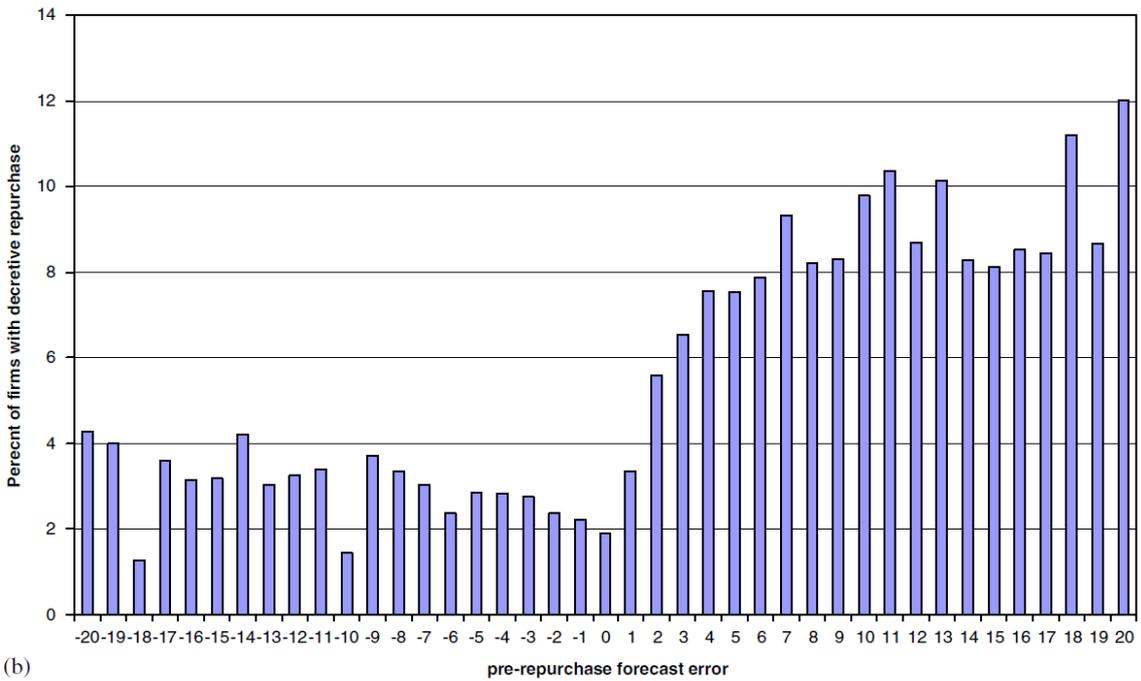
Website EPS calculation:

<http://cpaclass.com/gaap/sfas/gaap-sfas-128.htm>

Other figures Hribar et al. (2006)



(a)



(b)