BI Norwegian Business School - campus Oslo

GRA 19502

Master Thesis

Component of continuous assessment: Thesis Master of Science

Cash flow permanence and payout policy in the Norwegian market

ID number:	0771302, 0926246

Start:	02.03.2017 09.00
Finish:	01.09.2017 12.00

Name: Henning Strandås
Eirik Aleksander Bøe

Cash flow permanence and payout policy in the Norwegian market

Hand-in date:

05.07.2017

Programme:

Master of Science in Business, Major in Finance

Contents

1 Abstract

We investigate the relationship between cash flow shocks, its permanence and its link to payout policy for publicly listed firms in Norway. We reject the "permanence hypothesis" suggested by Guay and Harford (2000) treating dividend increases and share repurchases as complimentary. We find evidence that substantial dividend increases are used to distribute cash flow shocks that contain a permanent component, whereas we find indications that special dividends are used to distribute cash flow shocks that are somewhat transient in comparison. In extension, we find that share repurchases are not used to distribute cash flow shocks in this market, but firms that execute substantial repurchases experience a significant increase in average cash flow/assets in the coming two-year period lending support to the earnings signaling hypothesis and possibly supporting the market timing hypothesis. When examining the market reaction to payout announcements, we find support that substantial dividend increases are viewed as carrying a more permanent cash flow shock also by the market. On the other hand, we find no evidence that announcement of share repurchases are viewed as a sign of a more transient cash flow shock by the market. Altogether we find evidence pointing to dividend increases and special dividends being complimentary distribution methods of cash flow shocks in this market.

2 Acknowledgement

We want to express our gratitude to Siv Staubo who acted as supervisor on this thesis. During the writing of this thesis she asked intelligent questions which have helped us focus our work. We also want to extend our thanks to Johannes Skjeltorp for providing us with data on share repurchase announcements. Lastly, we want to thank all the lecturers we have had in the MSc in Business, major in finance program at BI. Any mistakes and omissions are the result of our own doing.

3 Introduction

Dividends and repurchases are the two main methods firms use to distribute cash to shareholders. Several theories try to explain the reasons behind the choice of payout policy, but the results from research into the choice between the two has been somewhat conflicting. (Brav, Graham, Harvey, & Michaely, 2005).

There is existing academic research on repurchases (Fjell, 2015; Skjeltorp, 2004) and dividend announcements (Capstaff, Klæboe, & Marshall, 2004) on the Norwegian market. However, there has been little academic research into the choice between the two main methods of payout in Norway. In this paper, we investigate whether there is a link between cash flow shock permanence and choice of payout method for listed firms in Norway. Formulated as the cash flow permanence hypothesis, we look for evidence supporting this theory for Norwegian listed firms. The cash flow permanence hypothesis sees repurchases and dividends as complementary. Repurchases are in part used to distribute more transient cash flow shocks and dividend increases are in part used to distribute more permanent cash flow shocks.

Wayne Guay and Jarrad Harford found evidence supporting their cash-flow permanence hypothesis for US listed firms in their research, which was also backed by contemporaneous research by Jagannathan, Stephens, and Weisbach (2000). Guay and Harford found that on average, cash-flow shocks preceding substantial dividend increases are significantly more permanent than cash-flow shocks preceding a repurchase announcement. They also found that the market assesses the permanence of cash flow shocks and use the method of payout to update its assessment. (Guay & Harford, 2000)

In our study, we found that repurchase announcements is not linked to transient cash flow shocks in Norway. As we will later see, repurchase announcement are possibly considered by the market to carry little information and seems to be a no cost option in general. After adjusting the methodology to account for differences between the US and Norwegian stock market, we found no evidence that substantial actual repurchases are used to distribute transient cash flow shocks in the Norwegian market either. We found that actual repurchases are used for other purposes than to distribute cash flow shocks independent of its permanence.

However, our results point to special dividends being used to distribute transient cash flow shocks - treating dividends and special dividends as complimentary. We found that substantial dividend increases are linked to higher permanence of cash-flow shocks compared to small/routine increasers in line with the earnings signaling hypothesis. We also found that small/routine dividends are linked with lower cash flow levels in the coming period, possibly a sign of dividend smoothing. We found evidence indicating that the market updates their assessment of permanence following an announced substantial dividend increase, but found no support that the market views a repurchase announcement as a signal of a more transient cash flow shock.

4 Motivation for study

In this section, we give a brief account of existing theory regarding payout policy and recent findings on the topic. When comparing older theory and more recent studies we will see ambiguous answers in relation to the choice of payout policy. Moreover, we will elaborate why this motivates our study.

This study seeks to answer why companies choose between the two main methods used to distribute cash to investors – share repurchases and dividend increases. According to Miller & Modigliani-theory, investors should be indifferent between receiving a payout and not, and payout policies (Miller & Modigliani, 1961). More recent research suggests that there are motives behind the choice of dividend vs. share repurchases. Share repurchases have been increasingly popular relative to dividends in the US (Goedhart, Koller, & Wessels, 2015). Dividends were the preferred method among large US-firms until the early 1980s, but share repurchases have gradually become more popular – about 50-60% of total distributions have been share repurchases since 1998 (Goedhart et al., 2015). This trend is also backed by Grullon and Michaely in their 2002 study on the topic (G. Grullon & Michaely, 2002). Current consensus treats share repurchases as not value creating on its own (Goedhart et al., 2015; Penman, 2013).

Dividend streams lies at the core of investors understanding of intrinsic value of a company. The dividend discount model and the idea of intrinsic value was first suggested by John Burr Williams in his 1937 Ph.D. thesis. *"The investment value*

of a stock is the present worth of all future dividends to be paid upon it . . . discounted at the pure [risk less] interest rate demanded by the investor" (Williams, 1938). This model was further advanced by Myron J. Gordon to the Gordon Growth model (Gordon, 1959). These models may contribute to explaining why companies trading in the financial market would want to smooth dividends or increase them, as dividend reductions are punished severely by the market (Lintner, 1956). This is backed by research which finds a link between dividend increases and positive abnormal returns and dividend reductions and negative abnormal returns. (Aharony & Swary, 1980; Li & Lie, 2006). It is suggested that dividend payments therefore limit the flexibility of a company. A more recent study shows that dividend payments are considered as a less flexible option to distribute cash, compared to share repurchases by Chief financial officer's (CFO's) from the US. (Brav et al., 2005) This finding is also backed by Stephens and Weisbach (1998), who conducted a study on 450 firms from 1981 to 1990 where they found that firms on average acquire 74 to 82 percent of the shares announced as repurchase target within three years of the repurchase announcement. They interpret this as implying that managers utilize the flexibility share repurchases inhibits. Furthermore, they found that share repurchases are negatively related to prior stock price performance, suggesting that firms increase their purchasing depending on its degree of perceived undervaluation. In addition, repurchases are positively related to levels of cash flow. Moreover, Bartov, Krinsky, and Lee (1998) argues that companies are more likely to distribute cash to investors through open market repurchases rather than dividend increases when management believes its stock is undervalued, management compensation packages include stock options, and the company's stockholder base is dominated by institutional investors. The findings from Bartov, E., et al. (1998) and Stephens & Weisbach (1998) suggests that firms are not indifferent between payout policy, opposed to what Miller & Modigliani proposed. The study by Stephens and Weisbach (1998) also suggests that there is a relationship between payout policy and cash flows. The relationship between payout policy and cash flows are confirmed by the findings of Jagannathan, M., et al. (2000). The authors found that firms experiencing relatively permanent cash flows will tend to use dividends as a payout policy, while firms experiencing relatively volatile cash flows tend to use share repurchase as a payout policy (Jagannathan et al., 2000). This finding could be argued to be line with Lintner's (1956) findings. Firms who

experience volatile cash flows would not want to commit to a dividend program. If they had to reduce, or hold the dividend constant in the future, it could result in a negative reaction from the market. Thus, indicating that share repurchases is the preferred choice of payout policy if the firm has volatile cash flows, due to its flexibility. Guay and Harford also discover a similar link for US firms. The authors find that transient cash flow shocks are distributed through share repurchases, while more permanent cash flow shocks are distributed with cash dividends (Guay & Harford, 2000).

As we have seen in this section, findings suggest that share repurchases is considered more flexible, compared to dividend payments which changes also affect abnormal returns - opposing Miller & Modigliani´s original theory. Furthermore, findings also suggest that the permanence of the cash flows could explain choice of payout policy. Consequently, our motivation behind this study is to contribute to this part of payout policy theory by examining if there is a link between the permanence of cash flow shocks and choice of payout policy for publicly listed firms in Norway.

5 Theory on payout policy

According to Miller and Modigliani (1961), investors should view dividends and share repurchases as perfect substitutes given perfect financial markets. Given an investment policy, arbitrage arguments render the choice of payout policy irrelevant to firm value, therefore shareholders should not have any payout preferences. In extension, shareholders should be indifferent between a payout and no payout given perfect financial markets as defined by Miller & Modigliani.

1. Equal and costless access to all information

2.No fees, taxes and other transactions costs

3.No differential between distributed and undistributed profits and dividends and capital gains

4. Rational behavior

5. Perfect certainty, complete assurance of future investment and profits

There is high probability that the financial markets are in violation of the above definitions. However, the purpose of this paper is not to prove these violations but rather explore if there exist determinants of choice of payout policy. We will therefore present different hypotheses regarding choice of payout policy, but we underpin the fact that we will only test for one of them.

5.1 Cash flow permanence hypothesis

The hypothesis we are going to test in this thesis is the cash flow permanence hypothesis. The hypothesis states that firms use dividends and share repurchases to distribute capital to investors dependent of the permanence of the future cash flows, hence treating the two methods as complimentary. Regular dividends are expected to be a fixed commitment to distribute capital to shareholders, which is linked with more permanent cash flows. Whereas share repurchases, are used to distribute more transitory cash flow shocks. (Guay & Harford, 2000; Jagannathan et al., 2000)

We are only going to test for the cash flow permanence hypothesis on the Norwegian market, but we will in the next sections present other theories that might also explain choice of payout policy.

5.2 Excess cash hypothesis

A hypothesis that explains why firms choose to pay out cash rather than retaining it, is the excess cash hypothesis. A firm with positive free cash flow can either retain it and/or invest in growth opportunities, or distribute it to shareholders through dividends or share repurchases. According to Jensen's study from 1986, managers will have incentives to retain free cash flow and invest it in negative net present value (NPV) projects to build empires for themselves - known as agency issues (Jensen, 1986). Paying out excess cash through share repurchases (or dividends) could mitigate the risk of firms destroying shareholder value by investing in negative NPV projects.

5.3 Information signaling hypotheses

5.3.1 Earnings signaling

Goedhart et al. (2015) suggest the market interprets the information signal of a payout announcement as managers showing confidence that future cash flows are

healthy enough to cover future investments and debt obligations. Furthermore, Carrol (1995) provides evidence that dividend changes cause analysts to change their earnings forecasts. A substantial dividend increase could therefore be a signal of strong future earnings. It has also been shown that reactions to share repurchases are positive, possibly as a result of earnings signaling (Dann, 1981). This is also supported by Vermealen in his 2005 review of share repurchases (Vermaelen, 2005). However, another study shows conflicting findings: The study finds evidence that open market share repurchases is not followed by improved operating performance (Gustavo Grullon & Michaely, 2004).

5.3.2 Market timing

According to this theory, a share repurchase announcement signals that management believes that shares are below intrinsic value. This is reinforced if management also purchases shares. Timing the repurchase has however been found to be more difficult than possibly anticipated by initiating companies. After controlling for smaller companies making one-time repurchases, there is little evidence that companies on average are able to correctly execute when the market value is below intrinsic value, leading to possible value destruction (Jiang & Koller, 2011). Another study found that smaller firms on average are able to correctly time the market, but larger firms do not, which could stem from less information asymmetry for bigger firms (Ben-Rephael, Oded, & Wohl, 2013). Undervaluation has been referenced extensively as reason for share repurchases (Dittmar, 2000; Ikenberry, Lakonishok, & Vermaelen, 1995). In a management survey from 2005 - 86.4% of respondents say they repurchase own stock when considering the stock underpriced (Brav et al., 2005).

5.4 Catering

Catering theory suggests that managers act to cater to investors preferences and to the current operating environment. For payout policies, it involves managers taking advantage of a low interest environment, in combination with undervaluation. By borrowing “cheap” to invest in own stock, this could be considered as a financial arbitrage by investors. If the firm is under leveraged and expect to be able to utilize its tax shield fully going forward, this could be a reason for executing share repurchases (Penman, 2013; Vermaelen, 2005).

In addition catering theory suggests firms are more likely to pay dividends when the market rewards dividend paying firms relatively higher (M. Baker & Wurgler, 2004; Li & Lie, 2006). Similarly it has been suggested that the increased use of share repurchases in the US stems from managements increased expectation from institutional investors to maintain and increase share price and to avoid takeovers rather than as a substitute to special dividends (DeAngelo, DeAngelo, & Skinner, 2000).

Investor preferences could also cause companies to choose one payout method over the other. H. K. Baker, Mukherjee, and Paskelian (2006) found that Norwegian CFO´s believes that cash in hand are more valued by investors contrary to capital gains, also known as the bird-in-hand preference. Therefore, cash dividends could be favored compared to share repurchases among Norwegian firms

5.5 Earnings Per Share management (EPS) hypothesis

The EPS management hypothesis states that share repurchases are used by the company to increase its EPS. This is a completely cosmetic result of share repurchase, however EPS can be a driver of firm valuation in some cases which could possibly lead to bubble-like tendencies (Penman, 2013). In the management survey by Brav et al. (2005) the authors find that 76% of respondents said that increasing EPS was a factor when deciding on using share repurchases.

5.6 Counter dilution effect of employee stock options

Another explanation for use of share repurchases could be to counter the dilution effect of employee stock options. Sometimes this is done when a firm is flush with cash, which increase the chance of being overpriced. This can then result in a bubble for EPS driven stocks as mentioned above. There is however risk of value destruction as the current market price of shares is higher than for exercised options, as they would likely not have been exercised if this was not the case. If the company is currently overvalued there is an increased value destroying effect (Penman, 2013). Even so, in the study by Brav et al. 68% of respondents say they repurchase stock to prevent dilution from employee stock option (Brav et al., 2005).

5.7 Optimal capital structure hypothesis

According to Frank and Goyal (2009), evidence has been found for companies seeking an optimal capital structure where the tax benefits of debt is offset by the financial distress costs, known as the trade-off theory. Bagwell and Shoven (1988) hypothesized that firms can use share repurchases to attain such an optimal capital structure by increasing its leverage. The authors argued that firms are more likely to repurchase its own shares if its leverage ratio is below its target. Although Bagwell & Shoven did not find evidence for the optimal capital structure hypothesis, Dittmar did in his study from 2000. Dittmar discovered that repurchasing firms have significantly different leverage variable compared to non-repurchasing firms, thus providing evidence for the optimal capital structure hypothesis (Dittmar, 2000).

5.8 Tax preference hypothesis

There could be differences in taxation that causes companies to treat share repurchases and cash dividends as substitutes. Tax advantages for investors when there is a difference between taxation of capital gains and dividend payments could cause companies to favor one payout method over the other. In **Appendix 1** there is a brief account of how changes in tax-rules affected the Norwegian market during our sample period, however little evidence have been found supporting the tax preferences hypothesis in Norway (H. K. Baker et al., 2006; Skjeltorp, 2004)

5.9 Maturity hypothesis

The maturity hypothesis, states that firms go through different phases of growth through its life cycle and age could therefore be a determinant of payout policy (Gustavo Grullon, Michaely, & Swaminathan, 2002). Lintner (1956) also underlines this argument, by stating that dividends are often paid out by mature companies. The reason is argued to stem from the fact that mature companies with low growth opportunities (negative NPV projects) wants to mitigate Jensen free cash flow hypothesis (Brav et al., 2005). Young companies, on the other hand, might have more growth opportunities (positive NPV projects) and consequently chooses to invest in those rather than paying out excess cash. The average firm age on the S&P 500 is 18 years, compared to 9 years on Oslo Stock Exchange (OSE) which might influence our results. Still, we note that S&P 500 is an index containing

the largest corporations in the US, and hence the average age is likely to be higher than for the OSE due to this fact. (OSE, 2016; Perkins, 2015)

6 Methodology

When investigating the first prediction of the permanence hypothesis;

"... the cash-flow shock preceding a dividend increase will have a larger permanent component than a cash-flow shock preceding a repurchase..."(Guay & Harford, 2000, p. 391),

we extract data on the firms on the Oslo stock exchange to create our sample. We divide the sample into firms announcing repurchases, and firms that increase or initiate dividend payments. Similar to Guay and Harford (2000) we work from the announcement date of dividend increase or repurchase authorization during a fiscal year *t* and then extract pre-shock cash flows over years *t-4* through *t-2*. We then find the cash flow shock in years *t-1* and t and the future cash flows from years *t+1* through *t+3*. Cash flow from operations (CFO) and total assets are extracted using Compustat Global and reflects CFO on the cash flow statement and total assets in the company annual report.

We scale cash flow from operations by beginning of period assets to reduce heteroscedasticity and spurious correlation stemming from firm size. Like Guay and Harford (2000) we measure the cash flow shock by comparing average cash flow in years *t-4* through *t-2*, with the average cash flow in years *t-1* and *t*. The raw cash flow shock, reversion and permanence are defined as follows

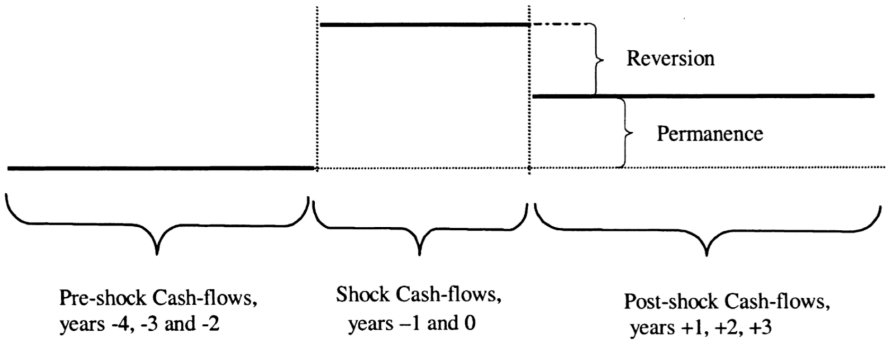
$$Cash\ flow\ shock = Avg\left(\frac{Cash\ flow}{Total\ Assets}\right)_{t-1\ and\ t} - Avg\left(\frac{Cash\ flow}{Total\ Assets}\right)_{t-4\ to\ t-2}$$

$$Reversion = Avg\left(\frac{Cash\ flow}{Total\ Assets}\right)_{t+1\ to\ t+3} - Avg\left(\frac{Cash\ flow}{Total\ Assets}\right)_{t-1\ and\ t}$$

$$Permanence = Avg\left(\frac{Cash\ flow}{Total\ Assets}\right)_{t+1\ to\ t+3} - Avg\left(\frac{Cash\ flow}{Total\ Assets}\right)_{t-4\ to\ t-2}$$

The cash flow shock measure captures the increase (or decrease) in cash flows around the event (t-1 and t) compared to past cash flows (t-4, t-3 and t-2). Reversion can be thought of as a measure capturing the extent to which future cash flows remain at the level of the cash flow shock around the event. The cash flow permanence hypothesis states that mangers who react to a cash flow shock by increasing its dividend substantially expect some portion of the shock to be permanent. The permanence measure captures the degree of which future cash flow (t+1, t+2 and t+3) will be below or above the pre-shock levels (t-4, t-3 and t-2) and should, according to the hypothesis, settle above prior cash flows to a greater extent for substantial dividend increasers compared to repurchasing firms.

The variables can be visually represented as below in the case of a positive cash flow shock, negative reversion and positive permanence.



Source: Guay and Harford (2000)

Our proxies for cash flow shock, reversion and permanence fail Jarque-Bera test for normality both before and after trimming the 1% maximum and minimum observations for most samples **(Appendix 2).** To be able to statistically test for differences between payout methods we will only report medians for each sample. For distributions sufficiently far from normal, a Mann-Whitney U test is far more efficient than a t-test (Conover & Conover, 1980), and hence we employ Wilcoxon signed-rank tests of sample medians to deduce significance from zero and use Mann-Whitney U tests to compare medians between payout methods. Please refer to **Appendix 3**, **4** and **5** for elaboration on Jarque-Bera test, Wilcoxon Signed rank test and Mann-Whitney U test, respectively.

To test the second prediction of the permanence hypothesis,

"... the market will use management's choice of payout method to update its belief about the permanent component of the cash-flow shock" (Guay & Harford, 2000, p. 391),

we continue using the same method as (Guay & Harford, 2000). We test whether the market reacts to the suggested inherent signal of the permanence of cash flows in payout method. To illustrate the idea of the investor reaction, conditional on the markets assessment of permanence, please consider Guay and Harfords example:

Conditional market assessment illustration

We assume that a company cash flow shock either dissipate or is completely permanent. Furthermore, if we assume that companies distribute all of the positive cash flow shock experienced (Nothing is retained in the company), then, if a company receives a positive cash flow shock in period 1 the CF in period 1 will be $CF_1 = CF_0 + Shock$. In the next period the $CF_2 = CF_0 + P \times Shock$, where P is the permanence parameter - a dummy variable taking value 0 or 1. The price of the stock will be contingent on the markets expectation of the permanence of the cash flow shock. The price of the firm in period 1 when the shock is observed will be P_1, where $P_1 = CF_0 + Shock + (CF_0 + \gamma(P = 1)\, Shock)$. The managers observe the permanence parameter, P, but the market does not. Therefore, the market must assess the probability that the permanence parameter equals one based on its information at the time of the shock, represented by γ. The managers then make a distribution announcement. If the shock is permanent, they choose a dividend; if the shock is temporary, they choose a repurchase. The market observes the choice of distribution method and updates its belief about the permanence of the shock.

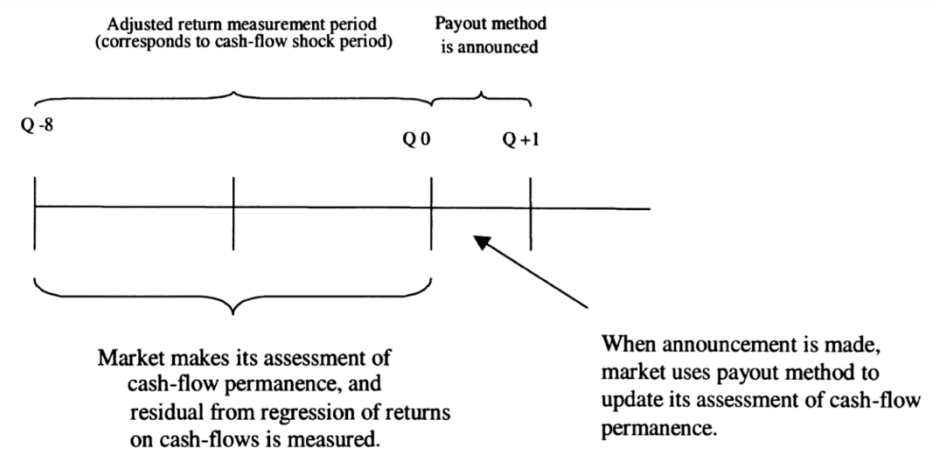
To investigate we need an estimate analogous to γ for each firm. We find this estimate for each company by regressing the market adjusted buy and hold return on the eight preceding quarters to the payout announcement on its cash flows for the same period. The regression used can be formally seen in **Regression 1**.

Regression 1

$$eight\ quarter\ return_i = \alpha + \beta(eight\ quarter\ cash\ flows)_i + \varepsilon$$

We then deduce whether the adjusted return is high or low by examining whether the regression residuals are positive or negative for each observation. A positive residual is a proxy of the market expecting the cash flow shock to be more permanent and a negative residual that the cash flow shock is more transient.

The timeline is illustrated below to clarify the regression.



Source: Guay and Harford (2000)

We assume that the market updates its prediction of cash flow permanence when payout form is announced. According to the theory we expected an underreaction from the market for a repurchase announcement if the adjusted return in the period preceding the announcement is high (positive residuals). Similarly, a low (negative residuals) adjusted return in the period preceding announcing increased dividend payments should result in an above average market reaction as the expectation of permanence is adjusted up. The permanence hypothesis predicts a negative relation between the adjusted return and the stock price reaction to the payout decision.

We compare the market reaction as cumulative abnormal return (CAR), around announcement date and the following trading day, between the two categories and payout methods. We do this to see whether we can reject the hypothesis that the market does not react to the choice of payout method in relation to our proxy for market assessment of cash flow shock permanence prior to announcement. Calculation of abnormal return and cumulative abnormal return is elaborated on in **Appendix 6** and when discussing the results in **Section 8**

7 Cash flow permanence and choice of payout policy

In this section, we explain how our samples were constructed and their sources. We also test the first prediction of the permanence hypothesis using the same methodology as described in the previous section and elaborated on here.

7.1 Data collection

7.1.1 Defining repurchase announcements and dividend increasing events

In the US, repurchase programs are often announced directly to the market, whereas in Norway the announcement is required by law to be approved at a general assembly and is therefore revealed through a general meeting protocol (Skjeltorp, 2004). Please refer to **Appendix 7** for details regarding share repurchase programs in Norway. The share repurchase announcement event date in our data set is the date when a NewsWeb message reveals that it has been authorized during general assembly. We were generously given repurchase announcement data between 1998-2013 stemming from previous research from Johannes A. Skjeltorp. In addition, we extended the acquired sample period with data until 2015 by using the same method, examining annual general meeting protocols in NewsWeb messages available from the Oslo Stock Exchange.

Dividend increases are defined in our dataset when the total cash dividends reported in the cash flow statement in a year is higher than the preceding year. We decided on this metric for several reasons. The dividend per share data for Norwegian companies was less complete in Datastream than financials from Compustat Global. In Norway, the dividend payments are usually done once or twice per year during our sample period, but usually announced once, in comparison to the US, where paying and announcing regular quarterly dividends is more common. Changes in quarterly dividend per share could stem from the firms' payout policy for dividends for example paying 60% of total year dividend and then 40% later on, which would have to be accounted for as not being a dividend decrease for the second payment. As we are investigating the link between a cash flow shock, payout policy and the permanence of said cash flow shock, the total yearly payout increase could be argued to be of more interest to investigate and hence we used this method of identifying dividend increases. The raw distribution can be seen in **Table 1.**

Table 1: Raw distribution over the sample period without accounting for company specific use of both methods within a year. Dividend increase is defined as the current year's total cash dividend exceeding the previous year total. Whereas each company repurchase announcement is limited to one per year as subsequent announcements could be considered extensions of current repurchase program.

Year	Repurchase announcements	Dividend increases
1996	0	21
1997	0	55
1998	17	57
1999	52	39
2000	57	43
2001	70	40
2002	58	33
2003	65	46
2004	62	49
2005	76	69
2006	104	44
2007	106	65
2008	97	64
2009	108	31
2010	89	56
2011	92	55
2012	87	46
2013	75	62
2014	45	61
2015	39	52
Total	1299	988

7.1.2 Data extraction

We extract financial data from 1995-2015 for Norwegian listed companies using a combination of Bernt Ove Ødegårds database on Oslo Børs, Compustat Global through WRDS and Datastream. From the Oslo Børs database provided by Bernt Ove Ødegaard (Ødegaard, 2017), we extract the "company – security" list, used to identify the link between available accounting data for companies and available equity data. From this list, we extract ISIN numbers for all the "Oslo Børs" listed firms with data available. We employed these ISIN numbers in a search of the Compustat Global database for publicly traded companies, also adding companies not included on the OBI list that has a Norwegian company code available in the database. This to ensure we get a sample that is as complete as possible for publicly traded firms in Norway, given available accounting data in Compustat Global. We use the Compustat Global database to extract cash dividends, total assets, cash flow

from operating activities and purchase of treasury shares, but exclude data from companies grouped as financial institutions in Compustat. Financial institutions, such as banks and insurance companies, are not included because of the nature of their business. For instance, debt will be large relative to equity, so leverage ratios will be skewed. In addition, cash flow from operations is not necessarily a good measure of operational performance. We also extract book value of equity, total liabilities, common shares outstanding and market value of equity from Datastream. Furthermore, we obtain announcement data for special dividends from Datastream. Since special dividends will lead to an increase in cash dividends they will be shown as a dividend increase in our sample. We want to test for the difference between share repurchases and regular dividend increases and the exclusion of special dividends is therefore necessary to capture this relationship.

7.1.3 Cleaning the dataset for testing

In order to test our hypothesis, we excluded events when the firms both announced repurchase and increased dividend within the same year as according to theory we should expect the cash flow shock in this instance to contain both a transient and a permanent component.

91 events were excluded for firms that exhibit negative average cash flow/assets for our event period (t-1 and t). The median cash flow shock for the removed firms is significantly more negative at the 1% level compared to the median cash flow shock of the remaining firm events using Mann-Whitney U test **(Appendix 9)**. These differences suggest that observing negative cash flow during the event reflects other substantial economic events than that of the treatment firms.

In the original study, Guay and Harford excluded the 1% most extreme events. As we have fewer observations in our sample we ran the tests twice. Before and after removing the 1% most extreme observations at max and min as a robustness check. For the samples which contained less than 100 observations we trimmed the maximum and minimum observation. As could be expected from our testing methodology, our results remained largely the same. We observed some tests for differences between medians becoming significant at a higher threshold, but not changing the overall interpretation of the results. Hence, we focus on the non-trimmed sample in the next section as we employ a non-parametric test that is robust

to outliers and does not require assuming normal distribution. The results after trimming is presented in **Appendix 8** for completion.

After ensuring that financial data is available to calculate the cash-flow shock, reversion and permanence for testing, we are left with 352 repurchase announcement events and 121 dividend increases.

7.1.4 Descriptive statistics:

As can be seen in **Table 2**, our complete dataset when adjusting for concurring events exhibit the following characteristics per firm year when categorizing on whether the firm has experienced a repurchase announcement, a substantial dividend increase or a small/routine dividend increase. A substantial dividend increase is defined as an increase in cash dividends that is larger than the previous year's percentage increase in cash dividends or a dividend initiation. A small/routine increase is a year on year dividend increase that is not substantial.

We found 87 substantial dividend increases, and 34 small/routine increases.

Table 2: Characteristics of firms around event. Market value of equity (MVE) is ending share price multiplied by number of shares outstanding. Book assets is Total Assets as reported on the balance sheet. Market-to-book (assets) is (book liabilities + market value of equity)/book assets. Leverage ratio is calculated as book liabilities/market value of equity. %-of shares sought is based on statements made by the company in their announcements of share repurchases.

Characteristics of sample firms	Mean and Median	Repurchase announcers	Substantial dividend increasers	Small/routine dividend increasers
Market value of equity	Mean	9925.78	17057.00	17507.71
	Median	1224.16	2132.99	4749.70
Book assets	Mean	13295.00	25586.83	23279.14
	Median	1518.90	2578.64	1882.11
Market -to- book (assets)	Mean	2.309	2.184	3.728
	Median	1.317	1.294	1.805
Leverage ratio	Mean	1.495	1.368	0.550
	Median	0.716	0.694	0.343
% shares sought	Mean	9.28%		
	Median	10%		
# of obs included*		349	66	27

*For 31 of the observations we are testing for, one or more of the characteristics was not available in Datastream or Compustat Global and hence are left out from descriptive but included in the test.

In our sample for testing we see that small/routine dividend increasers exhibit lower leverage ratios than the others and higher market to book values. This could possibly indicate that more growth companies are represented in this category.

Repurchase announcers seem to be somewhat smaller companies than the other categories both in market value and book assets. However, this could be expected from the *maturity hypothesis*, as we are excluding firms that increase dividend and announce repurchase within the same year. We shall later see that we include mostly firms that has a very low payout level or does not return cash to investors in the event-year for this category.

7.2 Testing the cash-flow permanence hypothesis

In this part of our thesis, we test whether dividend increasing firms are subject to more permanent cash flow shock compared to share repurchasing firms. Overall, our findings do not find support for the cash flow permanence hypothesis. Our findings suggest that the permanence of the cash flow shock is not a determinant of choice between a dividend increase and a repurchase in the Norwegian market when using the methodology elaborated on in **Section 6.**

For the cash flow permanence hypothesis to hold we expect to find significance, both from zero and from each other, for a positive cash flow shock, negative reversion and positive permanence for the substantial dividend increase events and repurchase announcement events. In addition, the permanence component should be positive and relatively larger for substantial dividend increasers compared to share repurchases and small/routine increasers, reflecting the company experiencing a more permanent cash flow shock following the payout. The results from testing the raw differences in cash flow ratios, and percentage change in cash flow to assets are presented in **Table 3.**

Table 3 Medians of the cash flow shock, reversion of the cash flow shock and permanence of the cash flow shock for 352 repurchases announcers and 87 substantial dividend increasers and 34 small/routine dividend increasers. Panel A presents the raw differences in the ratio of cash flow to assets and Panel B presents the percentage changes in the ratio of cash flow to assets. Here, observations where average cash flow over assets are negative for t-4 to t-2, are removed since percentage change cannot be calculated with negative denominators.

Panel A: Raw difference in cash-flow to assets **Firms**	Cash Flow Shock (Median)	Reversion (Median)	Permanence (Median)	# of Obs
Repurchasers (Announcers)	-0.005	-0.005	-0.009	352
Substantial Dividend Increasers	0.000	-0.009	-0.007	87
Mann-Whitney test for Substantial Dividend Increasers versus Repurchasers (Announcers)	0.603	0.293	0.394	
Small/Routine Dividend Increasers	0.024*	-0.028***	-0.006	34
Mann-Whitney test for Small/Routine Dividend Increasers versus Repurchasers (Announcers)	1.515	2.637***	0.410	
Cross Testing				
Mann-Whitney test for Small/Routine Dividend Increasers versus Substantial Dividend Increasers	1.214	2.396**	0.516	

* significant at 10% ** significant at 5% *** signinficant at 1%

Panel B: % change in cash-flow to assets**** **Firms**	Cash Flow Shock (Median)	Reversion (Median)	Permanence (Median)	# of Obs
Repurchasers (Announcers)	-15,22%*	-4,02%	-19,52%**	304
Substantial Dividend Increasers	-3.76%	-9,29%	-11.18%	81
Mann-Whitney test for Substantial Dividend Increasers versus Repurchasers (Announcers)	1.625	0.442	1.087	
Small/Routine Dividend Increasers	14.81%*	-22.24%***	-6.88%	32
Mann-Whitney test for Small/Routine Dividend Increasers versus Repurchasers (Announcers)	2.707***	2.061**	0.609	
Cross Testing				
Mann-Whitney test for Small/Routine Dividend Increasers versus Substantial Dividend Increasers	1.053	1.775*	0.213	

* significant at 10% ** significant at 5% *** signinficant at 1%

**** % change removes negative valued denominators, eg obs w negative avg CF in t-4 to t-2

Because firms differ in their normal cash-flow-to assets ratios, we also look at percentage change in the ratios as an alternative measure of the changes in cash flow to assets.

7.2.1 Interpretation of results

For the substantial dividend increasing subgroup sample we find the cash flow shock to be zero, exhibit negative reversion and negative permanence which is not consistent with our initial hypothesis. Further, none of the ratios are statistically different from zero. In addition, the substantial dividend increasers and repurchase announcers cash flow shock, reversion and permanence are not statistically different from each other, leaving us unable to confirm that we are observing differences in cash-flow shock and its permanence linked to payout choice. When looking at percentage changes the cash flow shock is negative, but still insignificant, and does not change the interpretation.

The small/routine dividend increase subgroup sample have positive cash flow shock, negative reversion and negative permanence. Although cash flow shock and reversion is found significant, we can only conclude that small/routine increasers have more negative reversion compared to repurchases and dividend increasers and that experiencing a cash-flow shock seem to be a weak link to small/routine dividend increases given the significance levels. For the small/routine dividend increasing subgroup percentage changes we find a significant median cash flow shock of 14,81% of average baseline cash flow which is also significantly different at the 1% level from the repurchasing cash flow shock sample. The small/routine dividend increasers cash flow to assets is also found to reverse -22,24% and thus reverse below pre-event average cash flows following the cash flow shock as can be seen on the negative permanence which is insignificant. Like the findings in Panel A, these results might indicate that small/routine increasers keep their dividend at same amount as last year, or increase it incrementally after a cash flow shock even though the cash flow shock will dissipate the following years.

For the repurchasing subgroup sample, we find insignificant results for all components. We observe a negative cash flow shock, negative reversion and negative permanence component, but significance levels render interpretation less solid. For percentage change, we see that repurchase announcers now exhibit a significant negative cash flow shock at the 10% level. However, this does not change our overall interpretation much that there is little evidence of a link between cash flow shock permanence and choice between a dividend increase and a repurchase. We can only conclude that repurchase announcements does not seem to be linked to experiencing a cash-flow shock.

Altogether, we find little evidence supporting the cash flow permanence hypothesis for publicly listed firms in Norway using the methodology described in **section 6**.

In the next section, we will see that many firms do not conduct actual repurchases even though they announce it to the market. As a result, a lot of firms that does not follow through on repurchase announcements with actual repurchase of own stock, is included. At the same time, companies that announce repurchases, but choose to increase dividend instead, could be excluded. Therefore, we might experience endogeneity in our sample causing a bias in our test results. Consequently, we don't

put much emphasis on these findings, but rather explore whether we could use other approaches to test for the cash flow permanence hypothesis more tailored to the Norwegian market.

7.3 Motivation behind adjusting the methodology used for testing the cash-flow permanence hypothesis

Since we did not find significant evidence for the cash flow permanence hypothesis using Guay and Harfords methodology, we wanted to explore whether it could be differences between the US and the Norwegian stock market that influenced our results.

When comparing the Total payout on the OSE **(Figure 1)** compared with the S&P 500 **(Figure 2)** for the period between 1999-2015 we see different patterns emerge. We note that the S&P 500 is an index containing 500 of the largest companies in the US, while the OSE represents all the stocks on Oslo stock exchange. Even though the OBX might be a better comparison to the S&P 500, there is only 25 companies in that index which is not representative for the sample we are testing.

Figure 1: Total Payout OSE (Source: Bernt Ødegaard, OSE)

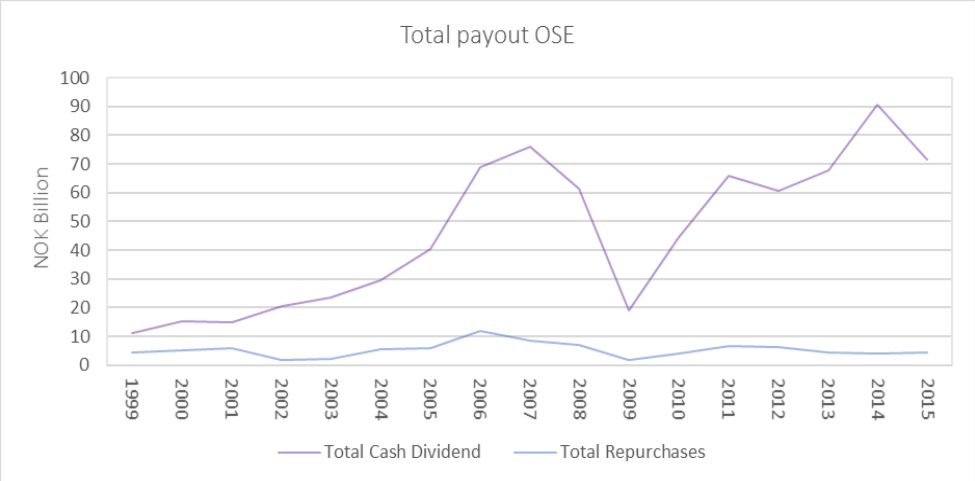
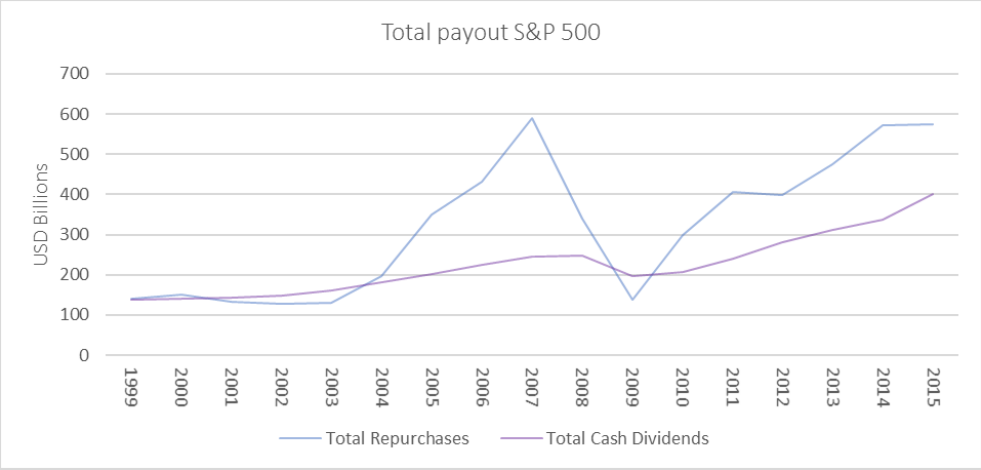


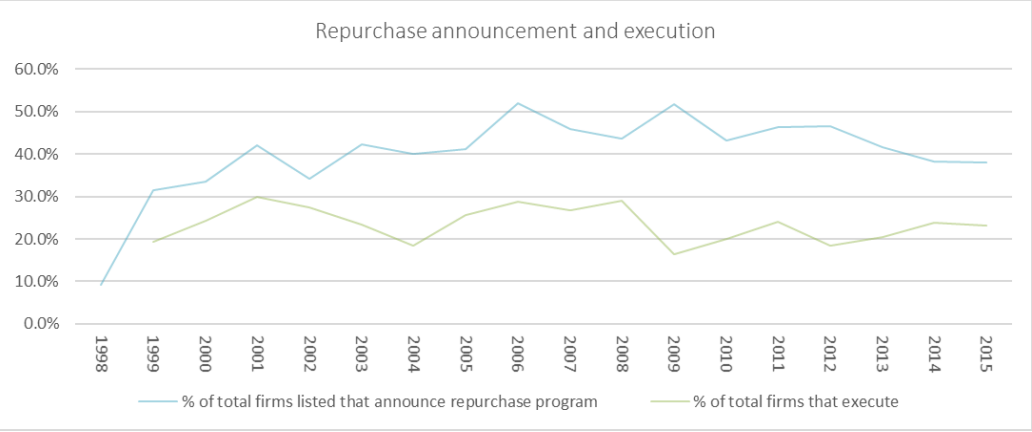
Figure 2: Total payout S&P 500 (Factset, 2015)



The S&P 500 seem to exhibit a steadier total value of dividend payments over time, whereas the OSE seems more volatile. We can also see that share repurchases, have over time become more dominant on the S&P 500, while its use is relatively muted and possibly declining in comparison on the OSE.

In terms of execution, announcement of repurchase agreements only results an actual purchase of shares on the OSE in the range 40-50% for any given year since 2008 in our data **(Figure 3)**.

Figure 3: A comparison of ratio of firms announcing and ratio of actual repurchasing firms per year compared to total number of listed firms



In the United states only about 11% of total firms on the S&P 500 did not execute any repurchases between 2004 and 2006 (Ben-Rephael et al., 2013). In our dataset,

72.76% of total listed companies did not execute any repurchases in the same period. As mentioned studies found that on average, US firms complete between 74 and 82% of their repurchase program within three years (Stephens & Weisbach, 1998). Research on the Oslo stock exchange found that the average Norwegian repurchase announcement program size hovers around 9% each year since 1999, but average actual repurchase execution amounts to under 0.5% with a median of 0 for each announcement. (Fjell, 2015)

In our dataset, the distribution of payout ratio exhibits high positive skewness and high kurtosis, failing Jarque-Bera test for normality at 1% level (**Appendix 13**). We define payout ratio as payout amount scaled on cash flow from operations (CFO) from the previous year. Hence, to create a proxy for a substantial repurchase event, we examine the medians for dividend paying firms which can be seen in **Table 4**.

Table 4: Median payout in % of CFO

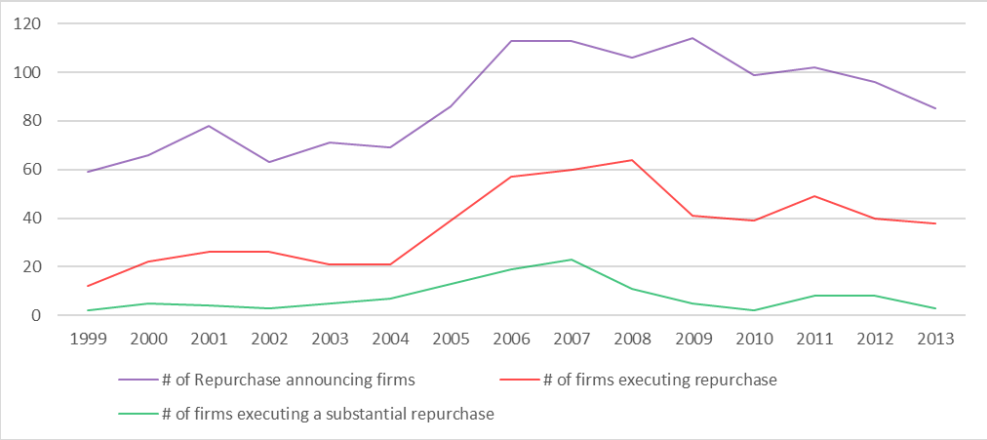
Payout amount adjusted for CFO in previous year*				
	Mean	**Median**	Min	Max
Repurchasing firms	55.98%	**7.33%**	0.00%	5566.32%
Dividend paying firms	96.62%	**27.60%**	0.02%	12989.81%

*Payout amount(t)/CFO(t-1)

From **Table 4,** we see dividend paying firms' payout ratio median is 27.60%, we therefore define a substantial repurchase to be when the repurchase amount was more than 25% of previous years CFO. This in order to be comparable payouts and to ensure we keep the number of events substantial.

When investigating the number of firms executing a substantial repurchase, it seems as if not only does an announcement not lead to a repurchases in about half the instances, but the payout size seems to be dwarfed compared to payout of dividends when adjusting for cash flow. We therefore believe this could be an indication that repurchase announcements does not signal intent of repurchase of own shares of the magnitude announced. A comparison between firms announcing repurchase, executing repurchase and executing substantial repurchase within a year can be seen in **Figure 4**.

Figure 4: Comparison of number of firms announcing, executing a repurchase and executing a substantial repurchase for each year in our sample period



Another explanation of the differences could be that the strict government regulation and ownership reduce the role of dividend policy as a signaling mechanism in Norway. Thus, as the information asymmetry lessens, the need to use dividends as signaling device decline. Since 2001 the ownership structure of firms listed on OSE has consisted of over 30% governmental ownership (Aksjonærstruktur, 2016).

When investigating regional and cultural differences in payout policies for the period between 1999 and 2011, Javakhadze, Ferris, and Sen (2014) found that firms located in Scandinavia smooth their dividends less than their common-law peers. In addition, they found that companies which operate under strong investor protection engage less in dividend smoothing, which could be argued to be the case for Norwegian listed companies.

In a survey in 2004, Managers in firms listed on the OSE, said that current-, expected future- and stability of earnings are the most important determinants of dividend policy decisions. Also, Norwegian managers put less emphasis on past dividends compared to their US peers. The authors also find evidence of the bird-in-hand explanation for paying dividends and that Norwegian managers believe investors prefer cash to stock dividends. This is in contrast to US firms where no empirical support is found for this explanation. (H. K. Baker et al., 2006) This may help explain the difference in payout pattern described in **Figure 1 & 2** where

dividend levels seem more volatile in Norway compared to the S&P 500 and where the opposite pattern emerges for share repurchases.

A study done by Goergen, Renneboog, and Da Silva (2005), "Why do German firms change their dividends?" provides insight in relation to differences between payout policy for German and US firms. The study discovers that dividend decision for German firms is mainly dependent on current cash flows. Compared to US firms who are very reluctant to cut their dividend, German firms view dividends as more flexible and cut, or raise, their dividend according to their current performance. This finding opposes Lintner´s view on dividends that is anchored for US firms. In addition, the authors only found evidence of a link to cash flows up to two years before the payout events for German firms.

Given the above points, it seems as if the firms on the OSE in general only executes on their repurchase agreement a fraction of the time and at a very low completion rate. Hence, we could interpret this as agreeing on a repurchase program during the general assembly as more of a routine proceeding. In extension, announcing a share repurchase on the OSE could merely be viewed as a no cost option. Hence, we do not expect the repurchase announcement in the Norwegian market to carry much information and would like to investigate whether actual repurchases is linked to transient cash flows. We also chose to shorten the cash flow averages as we hypothesize that more current financial data for Norwegian firms carry more information about the payout decision, like for German firms. In part due to Norwegian managers' lower emphasis on past dividends compared to US firms' managers when deciding on payout. As an added bonus, by shortening the cash flow averages we can test more observations as the amount of data that is necessary to calculate the components is not that exhaustive which could yield more robust results.

7.4 Collecting adjusted data

As shown, few of the firms that announce share repurchases go through and end up executing market repurchases. Thus, we hypothesize that the signaling effect from the market announcement is weak and we choose to investigate the cases where the firms complete actual share repurchases instead of repurchasing announcements.

We exclude annual actual repurchases that accumulate to under 25% of last year's cash flow from operations, because relatively small monetary buybacks (e.g. employee stock option related buybacks, possibly optimizing capital structure or other reasons) we hypothesize carry little, or no information regarding cash flows. We define the remaining observations as substantial repurchases. There are several repurchase methods which are elaborated on in **Appendix 12**. Our data on actual share repurchases does not discriminate between methods. However, other types of repurchase methods than open market share repurchases are very seldom used in Norway (Fjell, 2015). We are investigating links between share repurchase as payout method and cash flow from operations. Hence, share repurchase method should not affect our results.

Since a special dividend is not as likely to be repeated as a regular dividend according to theory (Brickley, 1983), we want to test whether special dividends are used to distribute more transitory cash flow shocks. We therefore use the special dividends data for Norwegian listed firms from Datastream used to exclude events earlier, and incorporate these events into our dataset. Special dividends are defined as a firm having a dividend increase and announcing a special or extraordinary dividend within the same fiscal year. Possibly these events could carry both a permanent or transient component depending on whether regular dividends are increased year over year which we do not account for. However, we include them as a category to see whether they are indeed the distribution of a cash-flow shocks and if the permanence of same is different than from a regular dividend increase.

As argued in the previous section, we also shorten the cash flow averages. By shortening the average baseline cash flow around the events to t-3 to t-2 and the average future cash flows to t+1 to t+2 (average cash flow shock period from t-1 to t remains the same) we obtain 270 substantial dividend increasing events 38 substantial share repurchase events, 81 Special Dividend events and 132 small/routine increasing events which we subsequently run through the same testing process to see whether we find any links with cash flow permanence hypothesis. Like in the original data collection section, we exclude observations where substantial actual share repurchase and dividend increase are observed in the same year. Summary descriptive of these firms can be seen in **Table 5**.

Table 5: Descriptive of sample to be tested after amending assumptions

Characteristics of sample firms	Mean and Median	Substantial repurchase execution	Special dividend	Substantial dividend increase	Small/Routine dividend increase
Market value of equity	Mean	4705.55	31486.87	13787.30	27370.31
	Median	1824.19	4240.82	1835.46	4749.70
Book assets	Mean	2340.20	36724.61	19440.00	39641.20
	Median	1019.53	3410.00	2909.25	5371.00
Market -to- book (assets)	Mean	4.147	2.380	1.809	2.234
	Median	2.255	1.349	1.233	1.365
Leverage ratio	Mean	0.457	1.031	1.323	1.003
	Median	0.211	0.615	0.851	0.776
% shares sought	Mean	9.43%			
	Median	10%			
# of obs included*		32	79	239	121

We see that our amended sample the small/routine dividend increasers have higher book assets value and lower market to book than in the initial sample. Their leverage ratio has also increased somewhat. Substantial dividend increasers are smaller in terms of MVE, Book assets and market to book than the small/routine sample. Special dividend category has the largest MVE and book assets and a lower leverage ratio than dividend increasers. The Substantial repurchase event companies have the lowest MVE, Book assets and leverage combined with the highest Market-to-book possibly being signs of growth companies.

7.5 Testing the cash flow permanence hypothesis on actual repurchases

In this section, we will test whether using shorter averages and looking at actual share repurchases instead of share repurchase announcements could find support for the cash flow permanence hypothesis.

We find no link between actual repurchases being a distribution of a cash flow shock, and consequently no evidence for the cash flow permanence hypothesis, given our methodology on Norwegian listed firms. However, we find that there is indication that special dividends are used to distribute more transitory cash flow shocks. Furthermore, we find that substantial dividends are used to distribute more permanent cash flow shocks compared to small/routine increases in line with the *earnings signaling hypothesis* and possible signs of dividend smoothing as per Lintners predictions in the small/routine dividend increases. The findings from our test can be seen in **Table 6**.

Table 6: Medians of cash flow shock, reversion and permanence for 38 substantial share repurchasers, 81 special dividends, 270 substantial dividend increasers and 132 small/routine increasers. Panel A shows the raw differences in cash flow to assets. Panel B presents the percentage change in cash flow to asset ratios. There is fewer observations in Panel B as we have to remove negative average cash flows for t-3 and t-2 in order to avoid negative valued denominators when calculating percentages Repurchasers (substantial actual) is the actual repurchasers that repurchase for an amount that exceeds 25% of their last year's cash flow from operations. Observations with special dividend, regular dividend increase, and or share repurchases in the same year, are excluded. However, firms that make unsubstantial repurchases and dividend increases or use special dividends within the same year are treated as dividend increasers or special dividend as we hypothesize that there is no link to cash flow from operation in small actual repurchases.

Panel A: Raw difference in cash-flow to assets **Firms**	Cash Flow Shock (Median)	Reversion (Median)	Permanence (Median)	# of Obs
Repurchasers (Substantial Actual)	-0.003	0.015*	0.036**	38
Special dividend	0.011*	-0.007	-0.002	81
Substantial Dividend Increasers	0.017***	-0.011***	0.006	270
Mann-Whitney test for Substantial Dividend Increasers versus Repurchasers (Substantial actual)	1.304	2.985***	1.808*	
Mann-Whitney test for Substantial Dividend Increasers versus Special dividend	0.876	0.621	0.653	
Small/Routine Dividend Increasers	0.004	-0.023***	-0.014**	132
Mann-Whitney test for Small/Routine Dividend Increasers versus Repurchasers (Substantial Actual)	0.552	3.583***	2.934***	
Mann-Whitney test for Small/Routine Dividend Increasers versus Special dividend	0.472	2.393**	1.618	
Cross Testing				
Mann-Whitney test for Small/Routine Dividend Increasers versus Substantial Dividend Increasers	1.517	2.094**	2.859***	
Mann-Whitney test for Repurchasers (Substantial Actual) versus Special dividend	0.636	2.305**	1.850*	

* significant at 10% ** significant at 5% *** signinficant at 1%

Panel B: % change in cash-flow to assets**** **Firms**	Cash Flow Shock (Median)	Reversion (Median)	Permanence (Median)	# of Obs****
Repurchasers (Substantial Actual)	-30.61%	26.06%**	4.78%	31
Special dividend	6.63%**	-3.09%	-1.85%	78
Substantial Dividend Increasers	10.51%***	-9.88%**	1.68%**	248
Mann-Whitney test for Substantial Dividend Increasers versus Repurchasers (Substantial actual)	2.282**	2.624***	0.393	
Mann-Whitney test for Substantial Dividend Increasers versus Special dividend	0.546	1.058	0.180	
Small/Routine Dividend Increasers	-1.85%**	-20.47%***	-14.08%**	126
Mann-Whitney test for Small/Routine Dividend Increasers versus Repurchasers (Substantial Actual)	1.969**	3.583***	1.590	
Mann-Whitney test for Small/Routine Dividend Increasers versus Special dividend	0.344	2.710***	1.851*	
Cross Testing				
Mann-Whitney test for Small/Routine Dividend Increasers versus Substantial Dividend Increasers	0.966	2.028**	2.706***	
Mann-Whitney test for Repurchasers (Substantial Actual) versus Special dividend	1.810*	1.945*	0.467	

* significant at 10% ** significant at 5% *** signinficant at 1%

**** % change we removed negative valued denominators, removing obs w negative avg CF in t-3 to t-2

In both Panel A and B, we see evidence that substantial dividend increasing events are linked to a significant positive cash flow shock. Moreover, parts of that shock is persistent in the future – reflected by the positive permanence component as seen in Panel A & B. This finding coincides with the *earnings signaling hypothesis*; if managers are to substantially increase their dividend, they asses that the outlook of

their firm is positive in terms of operating performance. It also points to cash flow shocks being distributed through use of dividends. There is also support in H. K. Baker et al. (2006)'s survey that managers of Norwegian companies put most emphasis on the current and stability/size of expected future earnings, but that they do not put weight on previous dividends when making dividend payout decisions. If so, when making a substantial increase, we see evidence in our data supporting that the management is assessing probable stability and future size of cash flows relatively well.

In our sample, we observe no link between a positive cash flow shock and distribution through small/routine dividend increase with insignificant cash flow shock in panel A and significantly negative cash flow shock in panel B. We find that both reversion and permanence is significantly negative different from zero in both Panel A and B. Thus, firms who maintain their dividend, or increase it slightly, are subject to reversion and relatively lower cash flows in the following period. In the cross-test we see that the permanence is significantly lower for small/routine increase events compared to the substantial dividend increase events. Thereby providing further supporting evidence for the *earnings signaling hypothesis* for substantial dividend increasers. According to our findings, managers would choose to substantially increase their dividends if their current perception of operating outlook is promising. Likewise, a small increase in dividends might therefore be interpreted as a signal that managers are not that confident in future operating performance, but possibly reluctant to cut dividends given the negative reaction from the market (Capstaff et al., 2004; Strøm, 2013) as suggested by Lintner (1956). As the cash-flow's must be seen in relation to each other, we may be observing sustainable dividends over time that are robust to lower cash flow in the coming period, but would again need further research to support or reject this claim.

We observe that special dividends could be used to distribute more transitory cash flow shocks in the data. From Panel A & B we see that there is a positive cash flow shock linked to special dividend events and that the shock seems transitory given the negative permanence. However, we only find significance for a positive cash flow shock and the permanence is not significantly different from zero, or from the hypothesized more positive permanence ratio in the substantial dividend sample. We therefore cannot conclude with statistical significance whether special

dividends are used to distribute more transitory cash flow shocks but underline the fact that our findings point in that direction.

We see no positive significant cash flow shock for firms deciding to engage in substantial repurchases of own shares. Hence, we do not see evidence of substantial repurchases being used to distribute more transient cash-flow shocks as per the permanence hypothesis. We find however that substantial share repurchases have positive reversion and permanence, which is significantly larger than substantial dividend increasers, in both Panel A & B. This could be further evidence of these companies being growth firms as per our observation in the descriptive statistics. We observe that for the substantial repurchase events, firms experience an increase in cash flow the following period. Our findings might therefore also lend support to *Information signaling hypothesis*, and more specifically, *earnings signaling* by payout through repurchase and possibly the *market timing hypothesis*. We note that in the descriptive of substantial dividend increasers we seem to be observing relatively smaller firms which could be in line with Ben-Rephael et al. (2013) research finding that smaller firms are more successful in timing repurchases. As a simple assessment, when looking at the 2-year holding period return (HPR) from announcement of repurchase program for the firms in the sample of substantial repurchasing events, we find that these firms have an average HPR of 41.45% with a median of 32.82%. However, when adjusting for the OBX index return in the corresponding period, the adjusted HPR has negative mean and median, but not significantly different from zero for either **(Appendix 10)**. The OBX index return does not take into account any cost related to rebalancing. We have also not looked at HPR from execution, and can therefore not conclude whether these companies are actually able to time the market, but believe this area could be the focus of further research in light of our findings.

Altogether we find little support for the cash flow permanence hypothesis as an explanation of distribution of cash flow shocks on the Norwegian market. We see some evidence of special dividends being used to distribute more transient cash flow shocks, and that share repurchases are used for other purposes. We find comparable results for substantial dividend increasing events to those of Guay and Harford, being linked to more permanent cash flow shocks.

8 The information content in the method of payout

Since we found little support for "cash-flow permanence hypothesis" by examining financial data, we wanted to explore whether the information the market infers from company's choice of payout method aligns with our findings in the previous sections. We do this to increase the robustness of our findings for the Norwegian market, rejecting the cash flow permanence hypothesis.

8.1 Data collection

To test the hypothesis, we decided to backpedal and focus again on repurchase announcements and substantial dividend increases, as specified earlier. We want to test whether the market views a repurchase announcement event as an event containing no signal of distribution. We also want to see whether substantial dividend increases are viewed as a signal of future earnings in line with the information signaling hypothesis consistent with our findings. We use the methodology as described in **Section 6**. As per the previous section, we use 2-year average definitions for cash flow shock, permanence and reversion to identify repurchase events and substantial dividend increases rather than the 3 year definitions used by Guay and Harford. This was done since we found that 2 year averages better reflected cash flow shock events in **Section 7** and we want to investigate the relationship between cash-flow shocks and how they are distributed and ensure relatability to our previous findings. In addition, this increased the test sample, as less data points are needed per event. We excluded events where companies both announced a repurchase program and increased dividends within the same fiscal year as before, as one after the other could impact the market perception. This resulted in 587 repurchase announcement events and 123 substantial dividend increasing events. For these events, we used Compustat Global to extract quarterly cash flows for the 8 quarters preceding the events for each company. We used daily returns adjusted for dividends and other corporate events, like stock dividends, stock splits etc from the OBI database. We used Datastream to identify announcement dates for dividend increases by extracting announcement dates of dividends (reported quarterly) and pairing the date with corresponding ISIN in our original dataset. After ensuring data was available for the event study, we were left with 586 repurchase announcement events and 76 substantial dividend

increasing events where most of the excluded events were due to the correct announcement date not being available in Datastream.

8.2 Testing for the information content of method of payout

We first ran a cross sectional regression on the two-year marked adjusted holding period return up to the event, regressed on the eight quarterly cash flows preceding the event as described in **Section 6**. We used the value weighted portfolio available to us at OBI database (Ødegaard, 2017) provided by BI to market adjust Holding Period Return (HPR). We then saved the residuals for each event and used this to categorize each event as the market expecting the cash flow shock to be transitory (negative residual) or more permanent (positive residual).

We then proceeded to find abnormal returns (AR) around the event window. We used daily risk-free rate and Carhart and Fama-French factors from the OBI database to construct abnormal returns for each event. The calculation of AR, CAR and the use of Carhart four factor model is elaborated on in **Appendix 6**. The Cumulative abnormal return (CAR) from day 0 (event date) and day 1 (the following trading day) was collected for each event in line with recent similar studies of market reaction where we expect information to be absorbed relatively quickly.

Results of the event study can be seen in **Table 7**.

Table 7: Mean and median CAR for Substantial Dividend Increases & Share Repurchase Announcements

CAR t-test on means / Wilcoxon sign rank test on medians				
	Substantial Dividend Increases		Share Repurchase Announcements	
	Mean	Median	Mean	Median
Value	0.54%	-0.01%	-0.22%	-0.27%
t-stat / z-Value	0.73	0.97	-0.82	2.02**

** significant at 5% level

Our result show that the CAR for substantial dividend increasers are not significantly different from zero. The median CAR for share repurchase announcement events is significantly negative at the 5% level, whereas the mean is negative but not significant. The distribution fails the Jarque-Bera test and hence we focus on the median (**Appendix 14**). This indicates that share repurchase

announcers that does not increase their dividend in the same year experience an average negative reaction to the announcement. The economic implication of substantial dividend increasers suggests that there are some gains on average, but the distribution also fails the Jarque-Bera test for normality (**Appendix 14**). Hence examining the median being marginally negative and not significantly different from zero, suggests there are no positive or negative CAR for Norwegian public firms that substantially increase dividends while not announcing a repurchase program within the same year.

This is in line with a 2007 to 2013 event study on dividend changes on the Oslo stock exchange. Using the market model to estimate expected returns, it found no CAR for dividend increases but significant negative return for dividend decreases (Strøm, 2013).

For repurchase announcers we found significant negative CAR around announcement date focusing on the median as the distribution fail the Jarque-Bera test for normality. This is in contrast to Johannes A. Skjeltorps research which found positive CAR of 2.5% surrounding repurchase announcements for the period 1999-2001 (Skjeltorp, 2004).

8.3 Discussion of results

The Abnormal returns are presented according to classification as follows; The market expectation of permanence of cash flow shock combined with announcement of payout method. The expectation of permanence of cash flow is given by the residual in **Regression 1** and combined with the choice of payout method yields 4 categories. The mean and median CAR is presented for each group. The results are presented in **Table 8**.

Table 8: Interaction between stock price reaction to cash flow shock

	Stock price reaction to cash flows	Substantial Dividend is announced	Repurchase is announced
Market believes cash-flow shock to be permanent	High [Residual from Eq.(1) is positive]	Effect of occurrence of payout on stock price: positive	Effect of occurrence of payout on stock price: positive
		Effect of method of payout on stock price: 0 / small negative	Effect of method of payout on stock price: negative and more negative the stronger the belief that the shock was permanent (i.e., the greater the Eq. (1) residual)
mean CAR median CAR		**[0.02%]** **[-0.05%]**	**[0.21%]** **[-0.31%]**
Market believes cash-flow shock to be transitory	Low [Residuals from Eq.(1) is negative]	Effect of occurrence of payout on stock price: positive	Effect of occurrence of payout on stock price: positive
		Effect of method of payout on stock price: positive and more positive the stronger the belief that the shock was transitory [i.e., the more negative the Eq. (1) residual]	Effect of method of payout on stock price: 0 / small negative
mean CAR median CAR		**[1.18%]** **[0.33%]**	**[-0.47%]*** **[-0.24%]****

* significant at 10% level **significant at 5% level *** significant at 1% level

The distribution for all samples fail the Jarque-Bera test for normality before and after winsorizing (as we wanted to maintain the number of events given the sample size) the 1% most extreme maximum and minimum values **(Appendix 11)**. For statistical evidence, we investigate the non-trimmed sample and focus on the medians, but have included means for completion.

At face value, we find economic support for the cash flow permanence hypothesis for substantial dividend increasing events. CAR for Substantial dividend increasing events are higher when the proxy for market expectation of cash flow permanence suggests the shock to be transient for both mean and medians. However, none of the CAR medians are significantly different from zero using a Wilcoxon signed rank test and the medians are not significantly different from each other using a Mann-Whitney U test. When comparing choice of payout method, we find that there is significant difference at 10% level between median CAR for substantial dividend increasers which lends support to the market updating its perception of permanence

when a substantial dividend increase is announced. No other differences between medians are significant.

For repurchase announcing events, the theory predicts that the announcement signals a more transient cash flow shock. When the market anticipates higher permanence of the cash flow shock, we expect the CAR to be less than when the market expects the cash flow shock to be more transient. We find some support when looking at the medians, but note that only CAR when the market believes the Cash flow shock to be transitory is significantly negative which lends support to the opposite conclusion. According to theory we should observe significant negative CAR for a repurchase announcement when the market believes the cash flow shock to be permanent and closer to zero when the market believes it to be transient. There is also no significant difference between medians of repurchase announcing events. In total, our results for repurchase announcement events is not in line with the predictions according to the permanence hypothesis. It could be that we are observing the bird in hand effect, that investors prefer cash over stock dividends for transient cash flows. Or it could be combined, as we hypothesized in the previous section, with repurchase announcements carrying little information regarding size of and likelihood of payout. It could also be that there is no link between cash flow shock and repurchases as we found evidence of in the previous section and hence other information is inferred by the market to the announcement. At the same time given that all announcements of repurchases must be made at the general assembly, we may have bias from omitted variables from information given during the general assembly that is not accounted for.

Altogether, we find some economic evidence that the second prediction of the cash flow permanence hypothesis holds for substantial dividend increases, whereas we find little evidence to support it for repurchase announcements. We find evidence that the market updates its perception of permanence for substantial dividend increases rewarding the payout to a larger extent when believing the cash flow shock to be more transient before a substantial dividend increase compared to a repurchase announcement. This is in line with our findings when investigating the first part of the hypothesis that substantial dividend increasers have a higher permanence component and is linked to distribution of a cash flow shock. Statistically, when testing for difference in medians, we do not find significant

results for other combinations of medians which lends further support to rejecting the permanence hypothesis suggested by Guay and Harford **(Appendix 11)**.

9 Robustness of results

To ensure that our results are robust throughout we have employed non-parametric tests robust to outliers and non-normal distribution. We have also found supportive evidence both on our tests on fiscal values and on market reaction. In addition, we included special dividends in our test of distribution to account for other distribution method of payout.

10 Conclusion

We find that for publicly listed firms in Norway, substantial dividend increases and the use of special dividends are employed to distribute cash flow shocks. There are signs of special dividends being used to distribute more transient cash flow shocks than for a substantial dividend increase. We find that there is a significantly higher permanence for substantial dividend increasers compared to small/routine increases lending support to the *earnings signaling hypothesis* for publicly listed firms in Norway.

We find that announcement of a share repurchase program carries little information regarding distribution and that few repurchase announcements lead to a repurchase. Repurchases are dwarfed in value compared to dividends. In extension, we find no evidence of repurchases being used to distribute more transient cash flow shocks. However, we find some support for the *earnings signaling hypothesis* for substantial repurchases and a significant link to higher average cash flow/assets in the coming 2-year period following a substantial repurchase event.

We find that small/routine increases in dividends is linked with lower average cash flow/assets in the following 2-year period. This could be interpreted as a sign of dividend smoothing and reluctance to cut dividends in accordance with Lintners theory. As small/routine increases are not linked to a cash flow shock, there is little evidence of small/routine increased dividends being used to distribute short term cash flow gains.

In sum, we find little support for Guay and Harford's permanence hypothesis for Norwegian publicly listed firms. Rather, it seems as if dividends and special dividends are used complimentary to distribute cash flow shocks in this market.

10.1 Further research

It could be of interest to find a better proxy for intent to repurchase own shares. In our data, announcement of repurchase program carries little connection between agreeing on allowing repurchases during general assembly and execution of substantial buybacks. We have tried to improve this area by including a proxy for substantial repurchases. Employing this proxy or others when investigating links between other theories on the use of repurchases than the permanence hypothesis could be of interest.

Further, it could be of interest to build on and to see whether the replies from H. K. Baker et al. (2006) qualitative research on motivation behind payout in Norway yields the same results today. Of particular interest would be to investigate further the motivation behind using repurchases and special dividends in relation to regular dividends.

As we find little support for the permanence hypothesis explaining the use of repurchases in the Norwegian market, it could be of interest to examine other theories regarding choice of payout policy. Of particular interest could be market timing and earnings signaling as we find some indication of possible connection to these theories in our research.

11 Appendix

Appendix 1 – Norwegian tax system during sample period

Our repurchase sample runs from 1998-2015, covering 17 years. Within that period, 2 major changes in the tax system occurred:

1) Change in dividend tax in 2001

Before 2001, dividends represented the most tax efficient way of disbursing cash. After the company had paid its corporate tax, capital gains were taxed at 28% whereas dividends were exempted from tax. However, in 2001 a dividend tax of 11% was introduced with deduction up to 10 000 NOK. Nevertheless, dividends were still more favorable, taxation-wise, compared to share repurchases. For larger investors who received larger dividends the taxation consequently increased from 28% to 35,92%[1]. The dividend tax was removed in 2002 because of the double taxation argument and regained its full taxation favorability. (Finansdepartementet, 2002)

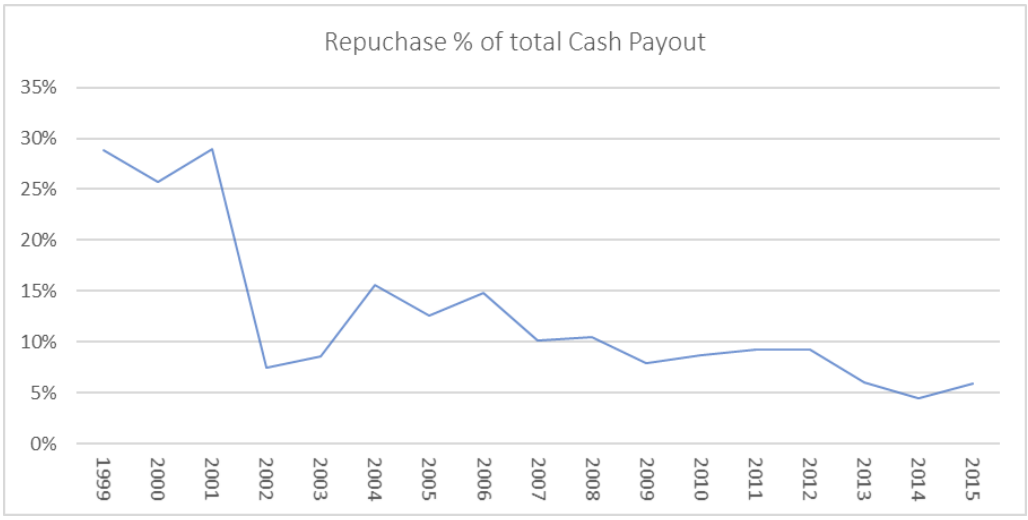
2) General Tax reform of 2004-2006

The general tax reform of 2004-2006 introduced the shareholder model. The shareholder model made dividends taxable at 28%, after deduction of risk free return. The shareholder model was mainly introduced to correct for taxation incentives that led to dividend based income instead of a personal income. Capital gains were still taxed at 28%, but losses were now deductible against ordinary income. (Skatteetaten, 2006)

Although dividends had a slight reduction in the favorability compared to share repurchases between 2001-2002, dividends should still be favored in our sample (taxation-wise) from 1999 to the tax reform in 2004-2006. After the tax reform, there is no taxation favorability choosing one payout method over the other. In Norway this would only affect foreign investors as there is virtually no difference for Norwegian taxed investors (Skjeltorp, 2004).

We have not tested specifically whether the change in tax affects payout policy, but from our data of payout method we do not observe a shift in repurchase ratio of

payouts after 2001 or 2006. Contrary to the tax preference prediction, the repurchase ratio of total cash payout has declined from 29% in 1999 to 6% in 2015 as described below according to our data. In addition, in a 2004 survey of managers in dividend paying firms in Norway, the authors found little support for the tax-preference explanation for payout policies (H. K. Baker et al., 2006).



Appendix 2 - Distributions of sample data

Table 10

Distribution of Cash-flow shock, Reversion and Permanence

	Raw			% change		
Table 4	Mean	Median	Jarque-Bera	Mean	Median	Jarque-Bera
Repurchase announcement						
Cash-flow shock	0.012	-0.005	46678.05	52.48%	-15.22%	57164.72
Reversion	-0.010	-0.005	18440.41	140.97%	-4.02%	464214.5
Permanence	0.002	-0.009	5640.90	-0.10%	-19.52%	110583.9
Substantial dividend increase						
Cash-flow shock	0.008	0.000	334.80	1271.92%	-3.76%	20515.96
Reversion	-0.015	-0.009	919.67	-299.38%	-9.29%	20272.73
Permanence	-0.007	-0.007	1366.62	11767.57%	-11.18%	20550.92
Small/Routine dividend increase						
Cash-flow shock	0.034	0.024	457.21	45.57%	14.81%	10.97
Reversion	-0.093	-0.028	241.47	-24.86%	-22.24%	1.199***
Permanence	-0.059	-0.006	302.49	-2.95%	-6.88%	1.595***
After trimming						
Repurchase announcement						
Cash-flow shock	0.007	-0.005	241.98	30.86%	-15.22%	6094.75
Reversion	-0.005	-0.005	12.07	61.27%	-4.02%	40056.81
Permanence	0.002	-0.009	148.46	17.98%	-19.52%	5252.60
Substantial dividend increase						
Cash-flow shock	0.009	0.000	227.43	43.73%	-3.76%	7760.41
Reversion	-0.011	-0.009	20.72	19.73%	-9.29%	1168.26
Permanence	-0.003	-0.007	17.56	56.85%	-11.18%	3822.32
Small/Routine dividend increase						
Cash-flow shock	0.019	0.024	0.135***	40.61%	14.81%	12.35
Reversion	-0.065	-0.028	731.17	-24.59%	-22.24%	2.202***
Permanence	-0.034	-0.006	215.13	-4.79%	-6.88%	0.461***
Table 7						
Substantial Repurchase						
Cash-flow shock	0.015	-0.003	2.592***	23.60%	-30.61%	15.10
Reversion	0.029	0.015	1.748***	156.23%	26.06%	818.69
Permanence	0.044	0.036	0.785***	77.44%	4.78%	172.36
Special dividend						
Cash-flow shock	0.015	0.011	41.23	65.37%	6.63%	6383.80
Reversion	-0.013	-0.007	11.05	36.27%	-3.09%	11343.63
Permanence	0.001	-0.002	0.85***	77.82%	-1.85%	7343.18
Substantial dividend increase						
Cash-flow shock	0.033	0.017	17930.33	194.08%	10.51%	389514.5
Reversion	-0.022	-0.011	1683.42	-68.99%	-9.88%	404674.4
Permanence	0.011	0.006	4578.65	142.01%	1.68%	466021.7
Small/Routine dividend increase						
Cash-flow shock	0.009	0.004	1254.02	42.35%	-1.85%	4114.02
Reversion	-0.041	-0.023	10627.76	-18.64%	-20.47%	84.99
Permanence	-0.032	-0.014	16120.64	6.70%	-14.08%	8774.49
After trimming						
Substantial Repurchase						
Cash-flow shock	0.014	-0.003	2.784***	15.34%	-30.61%	10.41
Reversion	0.027	0.015	1.846***	61.29%	26.06%	54.31
Permanence	0.044	0.036	0.913***	51.74%	4.78%	6.93*
Special dividend						
Cash-flow shock	0.013	0.011	11.76	39.22%	6.63%	2890.43
Reversion	-0.014	-0.007	11.89	11.27%	-3.09%	191.18
Permanence	0.001	-0.002	0.978***	44.38%	-1.85%	643.80
Substantial dividend increase						
Cash-flow shock	0.028	0.017	324.56	79.78%	10.51%	78651.18
Reversion	-0.019	-0.011	532.26	6.80%	-9.88%	10628.21
Permanence	0.010	0.006	85.11	58.24%	1.68%	22771.57
Small/Routine dividend increase						
Cash-flow shock	0.008	0.004	762.90	34.55%	-1.85%	2017.71
Reversion	-0.034	-0.023	22540.69	-17.95%	-20.47%	1.615***
Permanence	-0.023	-0.014	3070.77	1.17%	-14.08%	5922.78

*p-value > 0.01 **p-value > 0.05 *** p-value > 0.1

Appendix 3 – Jarque-Bera test for normality

To test whether our sample data is normally distributed, we use the Jarque-Bera to test if we have kurtosis and skewness like a normal distribution. The null hypothesis is a joint hypothesis that the excess kurtosis is zero (above 3) and that the skewness is zero. Hence, we reject the null hypothesis that the sample is normally distributed if our test statistic exceeds the Jarque-Bera critical values. The critical levels of the Jarque-Bera is dependent on the sample size. We therefore examine the p-values in order to define at what level we are able to reject the null hypothesis.

The Jarque-Bera test statistic is defined as

$$Jarque - Bera = \frac{N}{6}(S^2 + \frac{(K-3)^2}{4})$$

$$S = sample\ skeweness, K = sample\ kurtosis, N = sample\ size$$

For a more thorough and formal explanation please refer to Jarque & Bera´s paper from 1980. (Jarque & Bera, 1980)

Appendix 4 - Wilcoxon Signed rank test

To test whether the medians are significantly different from zero, we use the Wilcoxon Signed rank test. The Wilcoxon signed rank test is a non-parametric test procedure for the analysis of matched-pair data, based on differences, or for a single sample. The null hypothesis is that the differences, or individual observations in the single-sample case, have a distribution centered about zero. The absolute values are ranked. The test statistic is the sum of the ranks for either the positive or the negative values (Woolson, 2008). For a more formal walkthrough of the test, test statistics and critical values please refer to: Woolson, R. F. (2008). Wilcoxon Signed-Rank Test. *Wiley encyclopedia of clinical trials*.

We report z-stats and deduce significance level based on p-values.

Appendix 5 - Mann-Whitney U Test

The Mann-Whitney U test is a non-parametric test of differences between two groups on a single ordinal variable with no assumed or specific distribution. Under

the null hypothesis two samples come from the same population. Sometimes it is referred to as the non-parametric version of the parametric t-test. The Mann-Whitney U is conceptually similar to a t-test, determining whether two samples are from the same population. (Mann & Whitney, 1947; McKnight & Najab, 2010)

Since we are working with independent samples, share repurchasers and dividend increasers that differ in size, the Mann-Whitney U test is applied to test for differences between the medians in each sample where no specific distribution is required or assumed. We report z-stats, but significance level is based on p-values.

For a more thorough explanation of test statistics and critical levels please refer to (Shier, 2004)

Appendix 6 – Abnormal return calculation

We chose to use the Carhart 4-factor model to estimate excepted return. However, there exists several models that can be used to calculate expected return and we will therefore elaborate why we chose the Carhart four-factor model compared to other models in the section below.

The CAPM model, which is the cornerstone in asset pricing, was developed by several researchers in the early 1960´s (French, 2003). But in 1992 Fama and French introduced their three-factor model, arguing that CAPM was unable to satisfactory explain the average return for extended periods of time during the 20th century. Using cross sectional regression, they found that the market beta (β) used in the traditional CAPM did not have a good fit under back-testing. Their suggestion was to utilize non-traditional factors for asset pricing, namely a size-factor (SMB), a book-to-market factor (HML) and the traditional market portfolio factor (β) (Fama & French, 1992). In 1997 Mark Carhart extended the model developed by Fama & French by adding a momentum factor (UMD) (Carhart, 1997).

The Carhart 4-factor model is specified as follows:

$$r_i = R_f + \beta_{i,M}(r_m - R_f) + \beta_{i,S}SMB + \beta_{i,H}HML + \beta_{i,U}UMD$$

(The pricing factors and risk-free rate was found on Bernt Ove Ødegaards OBI database provided by BI together with daily returns. Daily returns are in the

database "raw" returns, (P(t+1)-P(t))/P(t), adjusted for dividends and other corporate events, like stock dividends, stock splits etc.)

Research have shown that the while the Fama & French 3-factor model is superior to the CAPM in terms of quality of prediction, the Carhart 4-factor model is even better than the 3-factor model (Bello, 2008). Furthermore, the Carhart model is now the industry standard applied by academics when assessing fund returns (Beach, 2013).

Taking the above points into account, we consequently chose to use the Carhart 4-factor model when calculating expected return.

Abnormal return enables us to measure whether the impact of the event is significantly different from zero, after accounting for the expected return given the specific characteristics of the firm we are measuring. Through subtraction of expected return from realized return, we obtain the abnormal return for each event which can formulated as follows

$$AR_{i,t} = r_{i,t} - E[r_{i,t}]$$

$$AR = Abnormal\ return \quad r = realized\ return \quad E[r_{i,t}] = Expected\ return$$

For the calculation period of the betas of the Carhart model we used data from 252 trading days before the event until 20 trading days prior to the event date. This to ensure our calculation period was long enough but not affected by possible information leakage prior to event date. We calculate expected return based on the betas obtained for each firm and as mentioned in the main body, we investigate CAR from day of the event plus the following trading day to capture the market reaction.

$$CAR_i = AR_{i,t} + AR_{i,t+1}$$

Appendix 7 - Share repurchases in Norway

Share repurchases were allowed from January 1, 1999 in Norway. This came as a result of the "allmennaksjeloven", later renamed "Lov om aksjeselskaper (aksjeloven)" of June 13, 1997 coming into effect. Norwegian firms were allowed to authorize repurchases as early as 1998, which is why we have announcements, but no executions in 1998. The authorization has to be approved by the general

assembly with at least 2/3 of the voting shares represented and cannot last for more than two years. The length of the program was changed from maximum 18 months to 24 months in 2013. The size of the authorized repurchase program cannot exceed 10% of shares outstanding. Repurchased shares are assigned as treasury shares with no voting or cash flow rights and may be retired, sold to the market, used in employee incentive programs or used as means of payment (Aksjeloven, 1997; Skjeltorp, 2004)

Appendix 8 – Test of permanence hypothesis with trimming

Table 10 – Testing permanence hypothesis on trimmed original sample

Panel A: Raw difference in cash-flow to assets **Firms**	Cash Flow Shock (Median)	Reversion (Median)	Permanence (Median)	# of Obs
Repurchasers (Announcers)	-0.005	-0.005	-0.009	344
Substantial Dividend Increasers	0.000	-0.009	-0.007	85
Mann-Whitney test for Substantial Dividend Increasers versus Repurchasers (Announcers)	0.630	0.279	0.416	
Small/Routine Dividend Increasers	0.024*	-0.028***	-0.006	32
Mann-Whitney test for Small/Routine Dividend Increasers versus Repurchasers (Announcers)	1.598	2.643***	0.314	
Cross Testing				
Mann-Whitney test for Small/Routine Dividend Increasers versus Substantial Dividend Increasers	1.281	2.437**	0.486	

Panel B: % change in cash-flow to assets**** **Firms**	Cash Flow Shock (Median)	Reversion (Median)	Permanence (Median)	# of Obs
Repurchasers (Announcers)	-15.22%**	-4.02%	-19.52%**	298
Substantial Dividend Increasers	-3.76%	-9.29%	-11.18%	79
Mann-Whitney test for Substantial Dividend Increasers versus Repurchasers (Announcers)	1.662*	0.444	1.118	
Small/Routine Dividend Increasers	14.81%*	-22.24%***	-6.88%	30
Mann-Whitney test for Small/Routine Dividend Increasers versus Repurchasers (Announcers)	2.775***	2.069**	0.682	
Cross Testing				
Mann-Whitney test for Small/Routine Dividend Increasers versus Substantial Dividend Increasers	1.761*	1.815*	0.207	

* = 10% **= 5% ***=1%

**** % change removes negative valued denominators, eg obs w negative avg CF in t-4 to t

Table 11 – Testing permanence hypothesis on trimmed adjusted sample

Panel A: Raw difference in cash-flow to assets **Firms**	Cash Flow Shock (Median)	Reversion (Median)	Permanence (Median)	# of Obs
Repurchasers (Substantial Actual)	-0.003	0.015*	0.036**	36
Special dividend	0.011*	-0.007	-0.002	79
Substantial Dividend Increasers	0.017***	-0.011***	0.006	264
Mann-Whitney test for Substantial Dividend Increasers versus Repurchasers (Substantial actual)	1.355	3.096***	1.906*	
Mann-Whitney test for Substantial Dividend Increasers versus Special dividend	0.898	0.632	0.666	
Small/Routine Dividend Increasers	0.004	-0.023***	-0.014***	130
Mann-Whitney test for Small/Routine Dividend Increasers versus Repurchasers (Substantial Actual)	0.586	4.061***	3.058***	
Mann-Whitney test for Small/Routine Dividend Increasers versus Special dividend	0.479	2.454**	1.655*	
Cross Testing				
Mann-Whitney test for Small/Routine Dividend Increasers versus Substantial Dividend Increasers	1.559	2.144**	2.934***	
Mann-Whitney test for Repurchasers (Substantial Actual) versus Special dividend	0.666	2.385**	1.927*	

* significant at 10% ** significant at 5% *** signinficant at 1%

Panel B: % change in cash-flow to assets**** **Firms**	Cash Flow Shock (Median)	Reversion (Median)	Permanence (Median)	# of Obs****
Repurchasers (Substantial Actual)	-30.61%	26.06%**	4.78%	29
Special dividend	6.63%**	-3.09%	1.85%	76
Substantial Dividend Increasers	10.51%***	-9.88%**	1.68%**	244
Mann-Whitney test for Substantial Dividend Increasers versus Repurchasers (Substantial actual)	2.375**	2.758***	0.412	
Mann-Whitney test for Substantial Dividend Increasers versus Special dividend	0.566	1.089	0.190	
Small/Routine Dividend Increasers	-1.85%**	-20.47%***	-14.08%**	124
Mann-Whitney test for Small/Routine Dividend Increasers versus Repurchasers (Substantial Actual)	2.060**	3.731***	1.660*	
Mann-Whitney test for Small/Routine Dividend Increasers versus Special dividend	0.357	2.780***	1.907*	
Cross Testing				
Mann-Whitney test for Small/Routine Dividend Increasers versus Substantial Dividend Increasers	0.993	2.064**	2.771***	
Mann-Whitney test for Repurchasers (Substantial Actual) versus Special dividend	1.910*	2.068**	0.491	

* significant at 10% ** significant at 5% *** signinficant at 1%

**** % change we removed negative valued denominators, removing obs w negative avg CF in t-3 to t0

Appendix 9 – Test of difference between median CF- shock on excluded and retained observations

Table 12

Test of median CF-shock	
	Median
Retained obeservations	-0.0026
Excluded observations	-0.0564***
Mann-Whitney test for difference	4.914***

* significant at 10% ** significant at 5% *** signinficant at 1%

Appendix 10 – HPR Substantial actual repurchasers

We found 29 events where the two-year holding period return was available and obtained the following results:

Table 13

Two-year HPR from announcement for substantial repurchase events

	Mean	Median	Jarque-Bera
Raw HPR	41.45%*	32.82%**	165.18
Market adjusted HPR by OBX return	3.57%	-13.61%	157.97

*significant at 10% **significant at 5% ***significant at 1%

Appendix 11 – Distribution of CAR per category

Table 14

Distribution of CAR

Before winsorizing	Mean	Median	Jarque-Bera
Negative residual - Repurchase announcement	-0.47%*	-0.24%**	268.64
Negative residual - Substantial dividend increase	1.18%	0.33%	163.14
Positive residual - Repurchase announcement	0.21%	-0.31%	4579.86
Positive residual - Substantial dividend increase	0.02%	-0.05%	41.79
After winsorizing at 2% level			
Negative residual - Repurchase announcement	-0.46%*	-0.24%**	104.28
Negative residual - Substantial dividend increase	1.00%*	0.33%	21.33
Positive residual - Repurchase announcement	0.23%	-0.31%	223.05
Positive residual - Substantial dividend increase	-0.27%	-0.05%	38.06

*significant at 10% **significant at 5% ***significant at 1%

For negative residual, there is significant difference at 10% level between substantial dividend increase and repurchase announcement medians using Mann-Whitney U both before and after winsorizing with Z-stats 1.910 and 1.933 respectively. No other difference between medians are significant. Since Jarque-Bera fails for all distributions (p-value < 1%), we focus on interpreting medians.

Appendix 12 – Repurchase methods

According to Vermaelen (2005), there are five ways a firm can repurchase its own shares.

Fixed price tender offer: The firm offers to repurchase its shares at a fixed price for a specified number of shares. If the shares tendered is larger than the target, the company can buy back any number between target and tendered shares. If the tendered shares are below the target, the company is committed to buy back all shares tendered.

Dutch auction tender offer: Instead of a fixed offer price, each tendering shareholder choose a minimum price acceptable to sell and the number of shares. The firm pays the minimum price that to all selling shareholders that gives them the number of shares sought.

Repurchase in the open market: The most common way to repurchase own shares. The firm employs a broker to buy shares on the open market.

Negotiated repurchase from private investors: The firm buys back its shares from a large investor.

Repurchase involving derivatives: Using derivatives to execute synthetic repurchases. Examples are selling put options, buying collars and buying forward contracts.

Appendix 13 – Jarque-Bera test on payout ratio

Payout ratio	
	Jarque-Bera
Repurchasing firms	833268.6
Dividend paying	5620105.0

*p-value > 0.01 **p-value > 0.05 *** p-value > 0.1

Appendix 14 – Jarque-Bera test on CAR

CAR	
	Jarque-Bera
Substantial Dividend Increase	168.88
Share Repurchase Announcement	13433.68

*p-value > 0.01 **p-value > 0.05 *** p-value > 0.1

Bibliography

Aharony, J., & Swary, I. (1980). Quarterly dividend and earnings announcements and stockholders' returns: An empirical analysis. *The Journal of Finance, 35*(1), 1-12.

(1997).

Aksjonærstruktur. (2016). Retrieved from https://view.officeapps.live.com/op/view.aspx?src=https://www.oslobors.no/content/download/121965/2108685/version/2/file/2016_Aksjonaerstruktur.xlsx)

Bagwell, L. S., & Shoven, J. B. (1988). Share repurchases and acquisitions: An analysis of which firms participate *Corporate takeovers: Causes and consequences* (pp. 191-220): University of Chicago Press.

Baker, H. K., Mukherjee, T. K., & Paskelian, O. G. (2006). How Norwegian managers view dividend policy. *Global Finance Journal, 17*(1), 155-176.

Baker, M., & Wurgler, J. (2004). A catering theory of dividends. *The Journal of Finance, 59*(3), 1125-1165.

Bartov, E., Krinsky, I., & Lee, J. (1998). EVIDENCE ON HOW COMPANIES CHOOSE BETWEEN DIVIDENDS AND OPEN-MARKET STOCK REPURCHASES. *Journal of Applied Corporate Finance, 11*(1), 89-96. doi:10.1111/j.1745-6622.1998.tb00080.x

Beach, S. L. (2013). The Fourth Factor: Tracking Momentum Exposure in Beta Returns. *Investment Risk and Performance Feature Articles, 2013*(1).

Bello, Z. Y. (2008). A statistical comparison of the CAPM to the Fama-French Three Factor Model and the Carhart's Model.

Ben-Rephael, A., Oded, J., & Wohl, A. (2013). Do firms buy their stock at bargain prices? Evidence from actual stock repurchase disclosures. *Review of Finance*, rft028.

Brav, A., Graham, J. R., Harvey, C. R., & Michaely, R. (2005). Payout policy in the 21st century. *Journal of Financial Economics, 77*(3), 483-527. doi:10.1016/j.jfineco.2004.07.004

Brickley, J. A. (1983). Shareholder wealth, information signaling and the specially designated dividend: An empirical study. *Journal of Financial Economics, 12*(2), 187-209.

Capstaff, J., Klæboe, A., & Marshall, A. P. (2004). Share price reaction to dividend announcements: Empirical evidence on the signaling model from the Oslo stock exchange. *Multinational Finance Journal, 8*(1/2), 115.

Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of Finance, 52*(1), 57-82.

Carroll, T. J. (1995). The information content of quarterly dividend changes. *Journal of Accounting, Auditing & Finance, 10*(2), 293-317.

Conover, W. J., & Conover, W. J. (1980). Practical nonparametric statistics.

Dann, L. Y. (1981). Common stock repurchases: An analysis of returns to bondholders and stockholders. *Journal of Financial Economics, 9*(2), 113-138.

DeAngelo, H., DeAngelo, L., & Skinner, D. J. (2000). Special dividends and the evolution of dividend signaling. *Journal of Financial Economics, 57*(3), 309-354.

Dittmar, A. K. (2000). Why Do Firms Repurchase Stock. *the Journal of Business, 73*(3), 331-355. doi:10.1086/209646

Factset. (2015). Disbursing Cash to Shareholders. Retrieved from https://research-doc.credit-suisse.com/docView?language=ENG&format=PDF&source_id=csplusresearchcp&document_id=1032855431&serialid=YPQuWVZFTYhT78xl8VImr9099KGVHNvr1XJkoqkSRkI%3D)

Fama, E. F., & French, K. R. (1992). The cross- section of expected stock returns. *The Journal of Finance, 47*(2), 427-465.

Finansdepartementet. (2002). Retrieved from https://www.regjeringen.no/no/dokumenter/otprp-nr-21-2001-2002-/id124385/sec6

Fjell, H. (2015). *SHARE REPURCHASES IN NORWAY*. NORGES HANDELSHØYSKOLE.

Frank, M. Z., & Goyal, V. K. (2009). Capital Structure Decisions: Which Factors Are Reliably Important? *Financial management, 38*(1), 1-37. doi:10.1111/j.1755-053X.2009.01026.x

French, C. W. (2003). The Treynor capital asset pricing model. *Journal of Investment Management, 1*(2), 60-72.

Goedhart, M., Koller, T., & Wessels, D. (2015). *Valuation: Measuring and Managing the Value of Companies*: JohnWiley & Sons.

Goergen, M., Renneboog, L., & Da Silva, L. C. (2005). When do German firms change their dividends? *Journal of Corporate Finance, 11*(1), 375-399.

Gordon, M. J. (1959). Dividends, earnings, and stock prices. *The review of economics and statistics*, 99-105.

Grullon, G., & Michaely, R. (2002). Dividends, share repurchases, and the substitution hypothesis. *Journal of Finance, 57*(4), 1649-1684. doi:10.1111/1540-6261.00474

Grullon, G., & Michaely, R. (2004). The information content of share repurchase programs. *The Journal of Finance, 59*(2), 651-680.

Grullon, G., Michaely, R., & Swaminathan, B. (2002). Are dividend changes a sign of firm maturity? *the Journal of Business, 75*(3), 387-424.

Guay, W., & Harford, J. (2000). The cash-flow permanence and information content of dividend increases versus repurchases. *Journal of Financial Economics, 57*(3), 385-415. doi:10.1016/s0304-405x(00)00062-3

Ikenberry, D., Lakonishok, J., & Vermaelen, T. (1995). MARKET UNDERREACTION TO OPEN MARKET SHARE REPURCHASES. *Journal of Financial Economics, 39*(2-3), 181-208. doi:10.1016/0304-405x(95)00826-z

Jagannathan, M., Stephens, C. P., & Weisbach, M. S. (2000). Financial flexibility and the choice between dividends and stock repurchases. *Journal of Financial Economics, 57*(3), 355-384. doi:10.1016/s0304-405x(00)00061-1

Jarque, C. M., & Bera, A. K. (1980). Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics letters, 6*(3), 255-259.

Javakhadze, D., Ferris, S. P., & Sen, N. (2014). An international analysis of dividend smoothing. *Journal of Corporate Finance, 29*, 200-220.

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review, 76*(2), 323-329.

Jiang, B., & Koller, T. (2011). The Savvy executive's guide to buying back shares. *McKinsey on finance*(41), 14-17.
Li, W., & Lie, E. (2006). Dividend changes and catering incentives. *Journal of Financial Economics, 80*(2), 293-308.
Lintner, J. (1956). Distribution of incomes of corporations among dividends, retained earnings, and taxes. *The American Economic Review, 46*(2), 97-113.
Mann, H. B., & Whitney, D. R. (1947). On a test of whether one of two random variables is stochastically larger than the other. *The annals of mathematical statistics*, 50-60.
McKnight, P. E., & Najab, J. (2010). Mann-Whitney U Test *The Corsini Encyclopedia of Psychology*: John Wiley & Sons, Inc.
Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *the Journal of Business, 34*(4), 411-433.
Ødegaard, B. O. (2017). OBI Database. Retrieved from http://finance-old.bi.no/~bernt/obidata/obidata/
OSE. (2016, 22. april 2016). Hva er snittalderen på børsen? . Retrieved from http://aksjenorge.no/aktuelt/2016/04/22/snittalderen-pa-borsen/
Penman, S. H. (2013). *Financial statement analysis and security valuation* (5. ed., McGraw-Hill internat. ed. ed.): Boston [u.a.] : McGraw-Hill.
Perkins, N. (2015). Retrieved from http://www.onlydeadfish.co.uk/only_dead_fish/2015/09/is-the-life-expectancy-of-companies-really-shrinking.html
Shier, R. (2004). The Mann-Whitney U Test Retrieved from http://www.statstutor.ac.uk/resources/uploaded/mannwhitney.pdf
Skatteetaten. (2006). Retrieved from http://www.skatteetaten.no/no/Radgiver/Rettskilder/Skattedirektoratets-meldinger/Skattereformen-2004-2006/
Skjeltorp, J. A. (2004). *The market impact and timing of open market share repurchases in Norway*. Norges Bank.
Stephens, C. P., & Weisbach, M. S. (1998). Actual Share Reacquisitions in Open-Market Repurchase Programs. *The Journal of Finance, 53*(1), 313-333. doi:10.1111/0022-1082.115194
Strøm, E. (2013). *Stock market reactions to dividend announcements: an event study of the Norwegian capital market.* University of Stavanger, Norway.
Vermaelen, T. (2005). Share Repurchases. *Foundations & Trends in Finance, 1*(3), 171-268.
Williams, J. B. (1938). *The theory of investment value* (Vol. 36): JSTOR.
Woolson, R. (2008). Wilcoxon Signed- Rank Test. *Wiley encyclopedia of clinical trials*.