Cash Flow Shocks and Permanence in Determining Payout Policy Decisions

Thomas Broek
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

This paper investigates cash flow shocks, next to the change of multiple control variables, as an additional determinant of payout policy alterations. A regression analysis was performed on two measures of dividend change, share repurchases and total payout change. Also, I hypothesize that firms signal a permanence component of the cash flow shocks by their choice of payout. A one way analysis of variance was used to see whether cash flow shock permanence differs between dividend increasing firms, share repurchasing firms and nonpayers. Additionally, Operating cash flows and non-operating cash flows are incorporated in the one-way analysis of variance to see whether flexibility arguments hold for choices of payout. Cash flow shocks are concluded to have a statistically significant positive relationship with total payout change and changes in dividend to earnings ratio, but not with share repurchases and percentage changes in total dividend paid. The one way analysis of variance resulted in insignificant differences in the permanence of cash flow shocks. Operating and non-operating cash flows were statistically significant, after which an additional post-hoc comparison of means was performed. The results do not support flexibility arguments that dividend increasing firms have relatively higher operating cash flows, whereas repurchasing firms have relatively higher non-operating cash flows.

Graduation Committee members:
Henry van Beusichem, Samy Essa, Rezaul Kabir, Xiahong Huang

Keywords
Payout policy; Share repurchase; Payout choice; Cash flow shocks; Permanence; flexibility; signaling

9th IBA Bachelor Thesis Conference, July 5th, 2017, Enschede, The Netherlands.

1. INTRODUCTION

Payout policy is subject to many key questions in corporate finance. We live in a world with imperfect markets, which makes corporate payout levels and methods complex concepts. Corporate payout policy decisions could affect firm valuation, impact taxes to be paid by investors and may affect management's investment decisions. Furthermore, payout policy may reduce information asymmetry by informing the market about future performance and expectations, on which part of this study will focus. Share repurchases and dividend payments are the two principal methods of paying out cash to shareholders. Even though share repurchases and dividend payments, in particular, have received quite a lot of individual attention, the choice between both and the factors driving the choice are not yet thoroughly explored. A lot of research has focused on dividend policy, as share repurchases have seen an extreme rise in activity and popularity in recent decades and were therefore left out in earlier studies. Even though total share repurchases have been growing extremely fast compared to dividend payments, dividend payments are still the most used form of payout. Dividends have been growing smoothly and steadily, whereas share repurchases grow disproportionally and account for a lot of variation during years, cycles and economical states (Stephens & Weisbach, 1998). The differences raise questions about the factors driving the payout methods and especially the choice between payout methods.

Brav et al. (2005) report that more than two-thirds of the CFOs of dividend-paying firms identify the stability of future cash flows as an important factor that affects dividend decisions. Firms pay out funds if managers expect strong future performance and therefore payout conveys indications of future performance. Lie (2005a) reports that firms that increase payouts concurrently exhibit a positive shock to operating income, and this shock is greatest if the payout takes the form of a regular dividend. Thus, evidence suggests that the decision to increase payout levels conveys positive information about concurrent income. Brook, Charlton, and Hendershott (1998) find that firms on the verge of large cash flow improvements tend to increase their dividends more than benchmark firms and Stephens and Weisbach (1998) argue that repurchases are positively related to levels of cash flow, which is consistent with liquidity arguments. Both expected and unexpected cash flows are positively related to repurchases, suggesting that firms actively adjust their repurchase behavior to their cash position. This evidence suggests that there is a link between cash flow shocks and changes in payout levels.

Theoretical models suggest that dividend payments convey information about future prospects (Bhattacharya, 1979; Miller & Rock, 1985). Another study from Lie (2005b), reports that repurchasing firms display improved operating performance, but the relative performance deteriorates after the announcement of repurchasing shares. Compared to similar control firms, repurchasing firms do illustrate improved performance, meaning that announcing share repurchases does signal improved performance. Consistent with this evidence, Skinner and Soltes (2011) report that dividend provides information about the extent to which current period changes in reported earnings are permanent. Benartzi, Michaely, and Thaler (1997) find that Firms that increase dividends show significant increases in concurrent earnings, but show no subsequent unexpected earnings growth. According to these papers it seems that payout changes signal something about concurrent income rather than about superior future performance. The results of Lintner (1956) indicated that managers behave as if they have a strong commitment not to cut regular dividend. This view taken by managers of maintaining steady dividend payments can be a reason for differentiating between payout methods. Repurchases give managers the flexibility to reduce the level and frequency of payout that regular dividends do not allow, except under obvious conditions of financial distress.

In line with the presented evidence, Jagannathan, Stephens, and Weisbach (2000) argue that dividend-paying firms tend to have higher permanent operating cash flows, while repurchasing firms tend to have higher temporary non-operating cash flows, as well as greater volatility of cash flows and of payouts. Chay and Suh (2009) also suggest that firms facing high cash-flow uncertainty may avoid paying dividends and instead use share repurchases. Guay and Harford (2000) find that firms tend to increase dividends in response to relatively permanent positive cash flow shocks, and to repurchase shares in response to more transient shocks. Consistent with Lintner's model on dividend policy, firms that increase dividends are less likely than nonchanging firms to experience a drop in future earnings. Thus, their increase in concurrent earnings can be said to be somewhat permanent, and this expectation of permanence may determine the method of payout. Andres, Doumet, Fernau, and Theissen (2015) support the flexibility hypothesis by their predictions that dividends are dependent on permanent earnings and flexible payout methods (repurchases) on transitory earnings. Repurchases, unlike dividends, do not lock managers into an implied need to continue to disburse the same or larger amounts of cash in the future. Therefore, evidence suggests that the permanence of cash flow shocks, that is the relative level of post-shock cash flows compared to 'shock' cash flows, can be a factor driving the choice between payout methods. In other words, managers signal their expectations of the permanence of positive cash flow shocks to the market by choosing between the payout methods, meaning the two methods are not perfect substitutes. Increases in payout do not necessarily signal future performance improvements, but rather signal how changes in underlying cash flows are permanent.

The main question to be answered in this study will be*:*

"Are cash flow shocks positively related to payout policy alterations?"

Additionally, the following question will be answered:

Does the method of payout signal varying degrees of permanence of cash flow shocks?

In order to answer these questions, data from Dutch, German and British firms is collected. The total period as assessed by this paper will cover data of the years 2007-2016. The online database ORBIS will be used as the main provider for all the data used in this study. ORBIS is a database that offers global financial company information. Additionally, Zephyr is used for the creation of a sample with repurchasing firms. Zephyr is a comprehensive database of deal information. Moreover, the repurchasing sample is expanded by manually searching for announcements of repurchases and consequently looking through annual reports. The total sample contains 2283 firm observations and 127 share repurchases.

The results showed that cash flow shocks do not have a significant positive relationship with percentage changes in paid dividends, as well as with share repurchases. However, cash flow shocks are positively related to the change in dividend to earnings ratio and total payout, with correlations of 12.087 and 12.241 respectively. Both variables showed statistical significance at the 1% level. Due to statistically insignificant results, the hypothesis that the method of payout signals varying degrees of cash flow shock permanence was rejected. Also, contrasting flexibility arguments, the hypothesis that dividend

increasing firms have higher operating cash flows, whereas repurchasing firms have higher non-operating cash flows was rejected.

The academic relevance of this study is contributing to existing literature by providing an alternative approach which looks at the movement of variables to explain changes in payout. Furthermore, this study tries to provide additional insights on debatable content, such as signaling and flexibility arguments. In practice, investors and shareholders could benefit from this knowledge because of better understanding of determinants of changes in payout policy and the choices between payout methods.

In section 2 the theoretical framework will be elaborated based on reviewing relevant literature. This section aims to provide information on the relation between cash flows and payout policy, the signaling function of payout policy and how payout methods signal differences in underlying cash flows. Furthermore, the hypotheses will be presented. Section 3 contains the methodology of two analyses, including the creation of a multivariate regression model, the definitions of independent, dependent and control variables and data selection. Results will be presented and discussed in section 4. Finally, section 5 will conclude the study and will elaborate on limitations.

2. LITERATURE REVIEW

2.1 Cash Flow as a Determinant of Payout Policy

Over the past several decades, a lot of research has been devoted to the determinants of corporate payout policy. Several theories of factors that may be important in determining a firm's dividend policy have been developed. For example, some of these theories involve tax preference, signaling, and agency explanations. Various models to explain dividend behavior have also empirically been researched. Some researchers conducted surveys of corporate managers to learn the most important determinants of corporate dividend activity. Found determinants include ownership, executive stock options and leverage ratios. The early work of Lintner (1956) revealed that the most important determinant of a company's dividend decisions was a major change in earnings relative to existing dividend rates. Moreover, as managers believe that shareholders prefer a steady stream of dividends, firms tend to make periodic partial adjustments toward a target payout ratio rather than dramatic changes in payout. Benartzi et al. (1997) also found that there is a strong past and concurrent link between earnings and dividend changes. Bartov (1991) reports that firms experience unexpected superior earnings performance in the repurchase announcement year. Research often focused on earnings, but Alli, Khan, and Ramirez (1993) argue that dividend payments depend more on cash flows, which reflect the company's ability to pay dividends, than on current earnings, which are less heavily influenced by accounting practices. According to them, earnings do not really mirror the firms' capability of paying dividends. Brook et al. (1998) find that firms on the verge of large cash flow gains tend to increase their dividends more than benchmark firms before the large cash flow jump. Bradley, Capozza, and Seguin (1998) report that there is a negative relation between expected cash flow uncertainty and dividend payout levels. Furthermore, Stephens and Weisbach (1998) find that both expected and unexpected cash flows are positively related to repurchases, implying that firms actively conform share repurchases to cash flows.

2.2 Information Content of Dividends and Repurchases

Signal theory implies that there exists asymmetric information between market participants. Announcements of repurchasing shares and the distribution of dividends are often interpreted as a way for managers to communicate insider information about future prospects. Miller and Modigliani (1961) concluded that future earnings were driving the firm's value and not current earnings. As earnings consist of permanent and transitory components, and dividends depend on permanent earnings, dividends could serve as a proxy for expected future earnings. This hypothesized relationship was labeled by Modigliani and Miller "the information content of dividends" and seems to be the first statement of the information hypothesis. Watts (1973) found trivial support for the information content of dividends by concluding a positive relationship between current unexpected dividend changes and subsequent future earnings changes, but the earnings changes appeared to be very small. There is little consistent evidence found regarding the information that dividends provide about future earnings. For example, DeAngelo, DeAngelo, and Skinner (1996) find virtually no support for the assumption that dividend decisions can identify firms with greater future earnings. Benartzi et al. (1997) were unable to find any evidence to support the view that changes in dividends convey information about future earnings. Even though past and concurrent earnings are related to dividend changes, the changes in dividend had very little predictive value of future earnings. They did conclude that firms which increased dividends were experiencing smaller subsequent earnings decreases compared with non-changing firms with comparable earnings growth. Therefore, changes in dividend do signal something; the concurrent earnings are permanent. Vermaelen (1981) observed that abnormal increases in earnings per share follow repurchases via tender offers, which does support the signaling hypothesis. Bartov (1991) finds that firms experience unexpected superior earnings performance in the announcement year of repurchases, but earnings change negatively in the year after. Skinner and Soltes (2011) argue that dividend-paying firms have more persistent earnings compared to other firms. Grullon and Michaely (2004) report that announcements of open-market share repurchase programs are not followed by an increase in operating performance. Overall, there is ambiguous support for the information hypothesis, but evidence suggests that payout does not necessarily signal superior future performance, but rather the permanence of an increase in concurrent earnings.

2.3 Cash Flow Shock Permanence and Payout Choice

After reviewing the literature of cash flows being determinants of payout policy and the fact that payout alteration can contain incremental information by displaying managers' prospects about the future, the next step is to review how cash flows are linked to different methods of payout. Evidence is consistent in supporting the early work of Lintner, who concluded that managers behave as if they have a strong commitment not to cut dividend. In 1982, "the safe harbor" rule 10b-18 was passed by the SEC, which secured US firms from being sued when repurchasing shares. Repurchases, were therefore not yet used in Lintner's study. Share repurchases are nowadays regarded as a more flexible manner of corporate payout. This implies that the payout methods are, unlike Grullon and Michaely (2002) suggest, not substitutes. Jagannathan et al. (2000) provide evidence that dividend-paying firms tend to have higher permanent operating cash flows, while repurchasing firms tend to have higher temporary non-operating cash flows, as well as

greater volatility of cash flows and of payouts in general. These differences in cash flows may be due to the more permanent and transitory nature of operating and non-operating cash flows respectively. Chay and Suh (2009) suggest that firms experiencing high cash flow uncertainty opt for the flexible repurchases and avoid the sticky dividends. Guay and Harford (2000) find that substantial dividend increases follow cash flow shocks which have a larger permanent component than cash flow shocks followed by both repurchases, small/routine dividend increases and no payout. This means that the cash flows of substantial dividend-increasing firms are less likely to regress to pre cash flow shock levels and are, thus, more permanent. Therefore, the permanence of contemporaneous cash flow shocks is related to the type of payout method chosen. Lie (2005a) reports that announcements of repurchases are accompanied by superior operating performance, but the relative performance decreases after the announcements. Compared to control firms with similar performance, repurchasing firms actually exhibit improved performance. This supports the view that payout signals a permanence component of underlying earnings. Consistently, Skinner and Soltes (2011) report that dividends present information about the degree to which current period changes in earnings are permanent. When managers consider an increase in earnings to be permanent, it will be accompanied by dividend increases, while earnings increases that are expected to be transitory will not. Consistent with the flexibility hypotheses, Andres et al. (2015), Ha, Hong, and Lee (2011) and Lee and Rui (2007) argue that dividends are used to disburse permanent earnings and more flexible payout methods (special dividends and repurchases) transitory earnings. Benartzi et al. (1997) find consistent evidence with Lintner's model on dividend policy; firms that increase dividends are less likely than nonchanging firms to experience a drop in future earnings. Thus, their increase in concurrent earnings can be said to be somewhat "permanent."

In view of this evidence I expect that cash flow shocks are important determinants of payout policy alterations. Furthermore, I do not expect that payout increases signal superior future performance, but rather signal how the underlying cash flow shock is permanent. Taking all into account the following hypotheses were developed regarding the question: *"Are cash flow shocks positively related to payout policy alterations?"*

H1a: Cash flow shocks have a positive relationship with dividend changes.

H1b: Cash flow shocks have a positive relationship with share repurchases

H1c Cash flow shocks have a positive relationship with total payout changes.

In respect to the second question; *"does the method of payout signal varying degrees of permanence of cash flow shocks?"* the following hypotheses were developed:

H2a: Dividend increasing firms display higher permanence of cash flow shocks than repurchasing firms

H2b: Repurchasing firms display higher permanence of cash flow shocks than non-paying firms

H2c: large dividend increasing firms display higher permanence of cash flow shocks than small dividend increasing firms

Additionally, an extra hypothesis based on flexibility arguments was developed:

H3: Dividend increasing firms display relatively higher operating cash flows, whereas repurchasing firms display higher non-operating cash flows

3. METHODOLOGY

This section will elaborate on the methodology that is used to answer the hypotheses, starting with a model and a test for differences between means, followed by definitions of the variables. Finally, data collection and handling is elaborated upon.

3.1 Description of the Analyses and Methods

3.1.1 *Model*

The research question to be answered in this study is: *"are cash flow shocks positively related to payout policy alterations?"* In order to answer this question related to hypotheses 1a, 1b and 1c, a multivariate regression model is developed where a cash flow shock is one of the independent variables. Multiple control variables are included which have been proven to affect payout policy as well. The regression will be run for two dependent variables of dividend change, share repurchases and total payout change. By using this approach I can test whether cash flow shocks have a positive effect on payout policy alterations. Denis and Osobov (2008) showed that dividends are affected by firm size, profitability, growth opportunities, and the earned/contributed capital mix. The profitability used in their model will be replaced by cash flow shocks. Cash holdings have been proven to be significantly associated with the amount of share repurchases and will be added to the model (Lee & Suh, 2011). Working from a distribution and announcement date in year t, lagged variables are used. According to Lintner, the financial figures of the previous year are important for the dividends paid in the year afterwards. All control variables will be converted to the change in variables in the years before the payout change, meaning the change from t-2 to t-1. The regression equation, which will be used for multiple dependent variables in this study, is the following:

$$\textit{Dividend change } (\Delta DIV)\ t = \alpha + \beta 1(GO)\Delta t\text{-}1 + \beta 2(ECM)\Delta t\text{-}1 + \beta 3(CH)\Delta t\text{-}1 + \beta 4(LEV)\Delta t\text{-}1 + \beta 5(FS)\Delta t\text{-}1 + \beta 6(CFS) + \varepsilon$$

The other dependent variables are change in dividend (ΔDIV2), value of shares repurchased and total payout change.

With:

GO = Growth opportunities

ECM = earned/contributed capital mix

CH = cash holdings

LEV = leverage ratio

FS = Firm size

CFS = cash flow shock

Δ = change compared to previous year

T = distribution year/repurchase announcement year

3.1.2 *Test for Differences*

The second question to be answered is the following: *Does the method of payment signal varying degrees of permanence of cash flow shocks?* This second research question, regarding hypotheses 2a, 2b and 2c, will be answered by using a different analysis and method. The third hypothesis, regarding differences in operating and non-operating cash flows will be answered with the same method. A subsample is created based on positive cash flow shocks along with positive cash flows

during the shock. The subsample is in turn divided into several groups depending on their method of payout. The groups are large dividend increasers, small dividend increasers, share repurchasers, firms that utilize both dividend increases and share repurchases, and nonpayers. Substantial dividend increases are increases which are larger than the increase in dividends in the year before, or firms that initiate dividends. Reason for creating this subsample is to eliminate dividend increases based on a continuous pattern of dividend payments. In order to test the second hypothesis, regarding differences in the permanence of positive cash flow shocks between groups, a one-way analysis of variance (ANOVA) will be used. This method allows for identifying inequality between means, but does not determine where differences lie. In order to analyze these differences, and to answer hypotheses 2abc and 3, additional post-hoc tests have to be conducted contingent on the results of the one-way ANOVA. Tukey's honestly significant difference (HSD) test is used for each individual comparison. Tukey's HSD test is chosen because it's favorable when sample sizes are unequal. In regard to the first analysis, different variables are introduced. The permanence of cash flow shocks, operating cash flows and non-operating cash flows are tested for differences.

3.2 Variables

This section starts by defining the dependent variables in the regression model and the dependent variables in the tests for differences in means. Next, independent variables are defined for both analyses, followed by the definitions of control variables.

3.2.1 *Dependent Variables Regression Model*

The dependent variable in this paper differs for the two types of analyses. In the model presented to test hypothesis 1a, 1b and 1c, the dependent variable is the change in payout. Change in payout is separated into two variables of dividend change, share repurchases and total payout change. Changes in dividend are analyzed in two different ways, first in percentage change of total dividend paid and second as the change in dividend to earnings ratio. The goal of this part is to see the impact of cash flow shocks on payout changes, which can be done more extensively with multiple payout variables.

$$\Delta(DIV) = \frac{dividend\ t}{dividend\ t-1}$$

$$\Delta(DIV2) = \frac{dividend\ t}{earnings\ t} - \frac{dividend\ t-1}{earnings\ t-1}$$

$$shares\ repurchased\ = \frac{Value\ shares\ repurchased\ t}{earnings\ t}$$

$$\Delta\ Total\ payout = \Delta DIV2 + shares\ repurchased$$

Share repurchases are seen as flexible, stand-alone actions, which is the reason why the whole amount of repurchases is taken as opposed to the change. As dividends are rigid and sticky, the dividend change is used to study the impact of independent variables.

3.2.1.1 Dependent Variable Test for Differences

In the second part of the analysis, the dependent variable is the choice of payout. I identify five selections of groups with different payout methods and I expect that the choice of payout is based on the independent variables which will be explained in the following section. The groups are large dividend increasers, small dividend increasers, repurchasing firms, firm who both increased dividend and repurchased shares, and nonpayers. Large dividend increasers are firms that either initiate dividend payments or increase dividends more than the prior year.

3.2.2 *Independent Variable Regression model*

The independent variable also differs for both parts of the paper. In the first part the independent variable is the cash flow shock, as included in the model. In order to compute the cash flow shock I identify baseline cash flows through years t-3 and t-2 and subtract those from 'shock' cash flows in years t-1 and t. T is the distribution or announcement year. Unlike other variables, the year t is included next to t-1 in this variable, as Benartzi et al. (1997) found that firms experienced significant earnings increases in years -1 and 0 and Bartov (1991) finds that firms experience unexpected superior earnings performance in the announcement year of repurchases.

$$CFS = \frac{\frac{CF(t)}{TA(t)} + \frac{CF(t-1)}{TA(t-1)}}{2} - \frac{\frac{CF(t-3)}{TA(t-3)} + \frac{CF(t-2)}{TA(t-2)}}{2}$$

With:

CFS = cash flow shock

CF = cash flow

TA = Total assets

3.2.2.1 Independent Variables Test for Differences

In the second analysis I expect that firms opt for a payout method based on the expected permanence of the underlying cash flow shock. The permanence of the cash flow shock is calculated by comparing the shock cash flows in year t-1 and t with cash flows in year t+1 and t+2. In order to compute the permanence of a cash flow shock the following equation is used.

$$CFSP = \frac{\frac{CF(t+1)}{TA(t+1)} + \frac{CF(t+2)}{TA(t+2)}}{2} \div \frac{\frac{CF(t)}{TA(t)} + \frac{CF(t-1)}{TA(t-1)}}{2}$$

With:

CFSP = Cash flow shock permanence

CF = Cash flow

TA = Total assets

Next to this, both operating cash flows and non-operating cash flows are analyzed for differences and are calculated in the following way:

$$Operating\ cash\ flows = \frac{operating\ cash\ flow}{total\ assets}$$

$$Non\ operating\ cash\ flow = \frac{Non\ operating\ cash\ flow}{Total\ assets}$$

3.2.3 *Control Variables*

This section contains definitions and additional information of the control variables included in the study. All control variables are lagged, meaning the values at t-1 are used.

3.2.3.1 Firm Size

Firm size can be measured in various ways, such as the number of employees, revenues and total assets. Often research makes use of total assets. In this case I will use the definition provided by Denis and Osobov (2008) and Chay and Suh (2009) amongst others, which means the firm size will be measured by the natural logarithm of total assets.

$$Firm\ size\ =\ logarithm\ of\ total\ assets\ (Log(TA))$$

3.2.3.2 Growth Opportunities

Fama and French (2001) find that firms with current high-profitability and low-growth rates tend to pay dividends, while low-profit/high-growth firms tend to retain profits. The Tobin's q ratio is used as a proxy for growth opportunities.

$$Growth\ opportunities\ =\ \frac{TA - BV(e) + MV(e)}{TA}$$

With:

TA = Total assets

BV (e) = Book value of equity

MV (e) = Market value of equity

3.2.3.3 Earned/Contributed Capital Mix

According to DeAngelo, DeAngelo, and Stulz (2006), firms with a low earned/contributed capital mix are in the capital infusion stage and can therefore not afford to pay dividends, while firms with a high earned/contributed capital mix are mature firms with large cumulative profits and thus are likely to pay dividends. I will use the retained earnings to total equity ratio as a proxy for the earned/contributed capital mix.

$$earned\ contributed\ capital\ mix = \frac{Retained\ earnings}{Total\ equity}$$

3.2.3.4 Cash Holdings

Cash holdings can have a significant effect on the cash available to make repurchases and dividend payments. Cash holdings have been proven to be significantly associated with the amount of share repurchases (Lee & Suh, 2011). The following equation is used to identify cash holdings:

$$Cash\ holdings = \frac{Cash\ \&\ cash\ equivalents}{Total\ assets}$$

3.2.3.5 Leverage Ratio

The debt-to-equity ratio indicates the proportion of shareholders equity to debt, which is used to finance company´s actions and assets. The equation formula for this ratio is:

$$Leverage\ ratio = \frac{Total\ debt + liabilities}{Total\ equity}$$

3.3 Data

Data is collected of firms listed on a stock exchange in The Netherlands, Germany and the United Kingdom which made payout changes between 2010 and 2014. In order to conduct the analyses, more financial information in subsequent years is needed dependent on the year of change. Ultimately, this study contains data of the years 2007 to 2016, which is the limit of the data collection period, as the source provides only 10 years of financial information. By using multiple countries and industries, a representative sample is created with potentially generalizable results. Foreign firms listed on any of the mentioned stock exchanges are excluded from the sample. Firms with SIC codes 4900-4949 and 6000-6999 are also excluded from the sample, as firms in these industries are subject to regulations affecting dividend policy. The remaining sample consists of 2283 observations with complete financial data. Financial data, including dividend payments, is acquired through the database of ORBIS. A sample with share repurchases has been created through Zephyr, which is a comprehensive database of deal information. The list is updated by manually searching for repurchases through announcements after which annual reports were checked for precise and complete data. The total amount of share repurchases of firms with complete data is 127. In regard to the second analysis, a subsample is created by filtering on firms with positive cash flows during the shock, as well as a positive shock. The remaining subsample consists of 584 observations and is subsequently dividend into large dividend increasers, small dividend increasers, repurchasing firms, firms that both increased dividends and made share repurchases, and a group of nonpayers. Large dividend increasers are firms which increased their dividends more than the previous years, or pay dividends when they did not pay dividends at all in the prior year. A control sample of nonpayers was identified for more extensive comparison.

4. RESULTS

This part contains the descriptive statistics of key variables, a correlation analysis, regression analysis, one-way ANOVA test and subsequent a Tukey's HSD post-hoc test. The results of the various analyses are presented and discussed.

4.1 Descriptive Statistics

In this section the key variables will be presented and described with the support of table 1. Table 1 provides the descriptive statistics of the variables, including the mean, median, standard deviation, minimum, maximum and the number of observations. Furthermore, definitions of variables can be found in the corresponding footnote.

The mean repurchase value of sample firms is 0.653 (65.3%) and has a relatively low standard deviation of 0.365. The minimum repurchase value is -4.974, which means that shares were repurchased along with negative earnings. The maximum number of 5.716 presents that the value of shares repurchased was more than quintuple of the value of earnings. The first variable of dividend change (ΔDIV) has a mean of 1.313 and median of 1.093, which suggests that most firms increased their dividends. The change in dividends displays a slightly skewed distribution towards an increase. The minimum of 0.000, which is by definition the lowest limit of the variable, can be explained by firms that omitted dividends. The maximum is 35.750, which means that the dividends paid were 35.750 times as high as the prior year. The second variable related to dividend changes (ΔDIV2) shows relatively high maximum and

Table 1
Descriptive statistics of key variables

	Mean	Median	S.D.	Min	Max	N
Repurchase value	0.653	0.478	0.365	-4.974	5.716	127
Δ DIV	1.313	1.093	2.584	0.000	35.750	2283
Δ DIV2	-0.219	0.012	9.695	-227.924	105.093	2283
Δ Total payout	-0.183	0.017	9.723	-227.92	105.09	2283
Δ Growth opportunities	0.117	0.071	0.445	-2.288	2.561	2283
Δ Ear./contr. mix	0.003	0.016	3.188	-30.659	26.854	2283
Δ Cash holdings	-0.000	0.000	0.048	-0.148	0.147	2283
Δ Leverage ratio	-0.410	-0.045	16.063	-70.079	71.512	2283
Δ Firm size	0.058	0.045	0.134	-0.367	0.475	2283
Cash flow shock	-0.001	0.002	0.057	-0.169	0.171	2283
Shock permanence	1.167	0.019	16.12	-213.182	219.963	584
Operating cash flows	0.109	0.095	0.064	-0.155	0.341	584
Non-operating cash flows	-0.090	-0.082	0.074	-0.361	0.144	584

This table displays descriptive statistics for each of the variables used in this study. Outliers have been removed by means of winsorizing. The sign Δ stands for the change in a variable compared to the prior year. The repurchase value is calculated by value of shares / earnings. ΔDIV is calculated by cash dividends paid / cash dividends paid in the prior year. DIV2 is calculated by cash dividend paid / earnings. Δ Total payout is calculated by repurchase value + ΔDIV2. Growth opportunities are calculated by (Total assets - book value of equity + market value of equity) / Total assets. Earned/contributed capital mix is calculated by retained earnings / total shareholders' equity. Cash holdings are calculated by cash & cash equivalents / total assets. Leverage ratio is calculated by (total debt + liabilities) / total assets. Firm size is calculated by the natural logarithm of total assets. Cash flow shocks are calculated by (average (cash flow t-1 / total assets t-1) + (cash flows t / total assets t)) – (average (cash flow t-3 / total assets t-3) + (cash flow t-2 / total assets t-2)). Shock permanence is calculated by (Average (cash flow t+1 / total assets t+1) + (cash flow t+2 / total assets t+2)) / (average (cash flow t-1 / total assets t-1) + (cash flow t / total assets t)). Operating cash flows are calculated by cash flows from operating activities / total assets. Non-operating cash flows are calculated by (cash flows from investing activities + cash flows from financing activities) / total assets.

minimum numbers, meaning that in extreme cases the change in dividend to earnings were as much as -227.924 and 105.093. The minimum can be explained by the fact that firms have omitted dividends whereas in prior years they paid high amounts of dividends with low earnings, or firms that paid high amounts of dividends and saw their earnings change to low negative numbers. The maximum number stems from firms that experienced significant drops in earnings, whereas dividend payments stayed relatively stable. As opposed to the first dividend variable, the second variable has a negative mean change in dividends of -0.219, with a median of 0.012. This shows a slightly skewed distribution towards a decrease in dividends. The Δ total payout variable is relatively similar to the change in dividend (ΔDIV2), although with a slightly wider range and larger standard deviation. The Δ growth opportunities have a mean of 0.117 and a relatively similar median of 0.071. This indicates that positive and negative changes are quite evenly distributed amongst sample firms. The minimum and maximum number of -2.288 and 2.561, respectively, also show that the distribution is fairly even, although slightly positively skewed. The Δ earned/contributed capital mix varies between -30.659 and 26.854 and has a mean and median of 0.003 and 0.016, respectively. The earned/contributed capital mix has a fairly high standard deviation of 3.118, which can be explained by the volatility of retained earnings. Cash holdings range between -0.148 and 0.147, have a mean and median of -0.000 and 0.000 and a standard deviation of 0.048, making it the least varying variable from this study. As opposed to Δ cash holdings, the Δ leverage ratio embodies the highest standard deviation of control variables, namely 16.063, making it the most volatile variable in the regression model. Both the mean and median are negative, indicating that most firms experienced a decrease in leverage ratio. The mean and median for Δ firm size are 0.058 and 0.045 which illustrates that most firms underwent growth. Moreover, the relatively low standard deviation shows that firms do not deviate much in terms of change in firm size. The cash flow shocks have a mean of -0.001, and median of 0.002. The mean shows us that the cash flows shocks underlying payout changes are, on average, negative for sample firms. The positive median, however, indicates that at least more than half of the firms experienced positive shocks, and the distribution is slightly skewed towards negative shocks. This could be explained by firms that are reluctant to decrease dividends due to stickiness, thus only decreasing dividends when they experience large negative cash flow shocks.

The remaining variables are only analyzed for a subsample which consists of firms that experience positive cash flow shocks, as well as positive cash flows during the shock. The mean cash flow shock permanence is 1.167 which shows that cash flows increase even after the cash flow shock underlying payout changes. However, the median of 0.192 shows the volatility of this variable, meaning that most firms do not experience these superior cash flows. The permanence of cash flow shocks has the highest standard deviation overall and ranges between -213.82 and 219.96. The operating cash flows do not seem to vary much and range between -0.155 and 0.341 with a standard deviation of 0.064. The non-operating cash flows have both a negative mean and median of -0.090 and -0.082 respectively, indicating that these cash flows are often negative. The non-operating cash flows do not deviate much amongst firms as well, as can be seen by the relatively low standard deviation of 0.074.

4.2 Correlation Analysis

A correlation analysis is used to review the degree of association between variables. Variables with significant correlations require extra attention when put in the same regression model. The results of the correlation analysis can be found in table 2. There are multiple variables with significant correlations. The Δ growth opportunities have a positive Pearson correlation of 0.077 with Δ earned/contributed capital mix. Δ Growth opportunities also show a relatively high correlation of 0.497 with Δ leverage ratio. Δ earned/contributed capital mix has a positive significant correlation with Δ leverage ratio as well, judged by the Pearson correlation of 0.148. Furthermore, the Δ earned/contributed capital mix is negatively correlated to cash flow shocks, as the Pearson correlation is -

0.089. Finally, Δ cash holdings have a high negative correlation of -0.624 with Δ firm size. The mentioned correlations all have p values of 0.000, which indicates statistical significance. The significant correlations give rise to potential multicollinearity problems. The variance inflation factor (VIF) quantifies the severity of multicollinearity in an ordinary least squares regression analysis. The VIF scores were well below 2 for all variables which indicate that multicollinearity problems are not present.

Table 2
Pearson correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)
Δ GO (1)						
Δ ECM (2)	0.077* (0.000)					
Δ CH (3)	-0.026 (0.221)	-0.013 (0.541)				
Δ LEV (4)	0.497* (0.000)	0.148* (0.000)	-0.009 (0.667)			
Δ FS (5)	-0.002 (0.921)	0.013 (0.539)	-0.624* (0.000)	-0.014 (0.506)		
CFS (6)	0.021 (0.316)	-0.089* (0.000)	-0.008 (0.691)	-0.030 (0.154)	0.025 (0.235)	

The table shows Pearson correlations between variables and corresponding p values in parentheses. Definitions of variables can be found in table 1. * indicates statistical significance at the 1% level.

4.3 Regression Analysis

The first hypotheses of this thesis were constructed to see whether cash flow shocks positively affect payout alterations. A regression model has been constructed for two different measures of dividend changes, repurchases and total payout changes. Multiple control variables were incorporated in the model. The results of the regression can be seen in table 3.

The first regression analysis was run for the variable ΔDIV, which measures a percentage change in the amount of total cash dividends paid in one year to another. The results show that cash flow shocks have a coefficient of 0.085, which suggests that there is a small positive relationship between dividend changes and cash flow shocks. However, the corresponding P value of 0.939 clearly indicates that the finding is not statistically significant. As a result, there is no evidence to accept hypothesis 1a. In other words, a positive relation between cash flow shocks and dividend changes (ΔDIV) cannot be concluded from these findings. In terms of the control variables, the Δ Firm size was found to have a positive coefficient of 1.251 with dividend changes and is statistically significant at the 1% level. Δ Growth opportunities are also found to have a positive relationship, although having a much smaller coefficient of 0.022, with statistical significance at the 10% level. The Δ earned/contributed capital mix and Δ cash holdings both have insignificant positive coefficients of 0.027 and 0.140, whereas Δ leverage ratio has an insignificant negative coefficient of -0.006. The R square of 0.008 is quite low for this model, which means that only 0.8% of values are explained by the model

The second variable related to dividend changes is ΔDIV2 and is measured by the change in the ratio of dividend to earnings in one year to another. The results show that cash flow shocks have very strong positive relationship with dividend changes (ΔDIV2) by the coefficient of 12.087. As opposed to the first variable related to dividend changes (ΔDIV), these findings are statistically significant at the 1% level. Judged by these results, the hypothesis 1a is accepted and a positive relationship between cash flow shocks and ΔDIV2 is concluded. The difference in results between both dividend change variables might be explained by the fact that firms often target a payout ratio rather than fixed amounts of dividends (Lintner, 1956). This means that dividend changes also largely depend on earnings, hence the different results in the regression models. As for the control variables, the Δ earned/contributed capital mix shows statistically significant results at the 5% level with a coefficient of -0.201. The Δ leverage ratio also shows a negative correlation of -0.006 with statistical significance at the 1% level. The variable Δ Firm size seems strongly positively related to dividend changes once again, with an even higher coefficient of 4.339 and statistical significance at the 1% level. Lastly, both Δ growth opportunities and Δ cash holdings have insignificant negative regression coefficients of -0.200 and -5.040 respectively. The r square of 0.017, although higher than for ΔDIV, is still relatively low which means only 1.7% of values are explained by the model.

The same regression was run for share repurchases. The produced results show a fairly high positive regression coefficient of 1.362 of cash flow shocks. The P value of 0.643, however, infers no statistical significance. The hypothesis 1b is therefore rejected and a positive relationship between cash flow

Table 3
Regression analysis

	Δ DIV	Δ DIV2	Repurchase value	Δ Total payout
Constant	1.214 (0.000)***	-0.448 (0.050)**	0.593 (0.000)***	-0.412 (0.072)*
Δ Growth opportunities	0.022 (0.074)*	-0.200 (0.663)	0.096 (0.784)	-0.190 (0.680)
Δ Ear./contr. mix	0.027 (0.217)	-0.201 (0.013)**	-0.003 (0.960)	-0.202 (0.013)**
Δ Cash holdings	0.140 (0.905)	-5.040 (0.301)	-2.273 (0.508)	-5.186 (0.289)
Δ Leverage ratio	-0.006 (0.915)	-0.123 (0.000)***	0.006 (0.639)	-0.122 (0.000)***
Δ Firm size	1.251 (0.002)***	4.339 (0.004)***	0.979 (0.434)	4.337 (0.004)***
Cash flow shock	0.085 (0.939)	12.087 (0.003)***	1.362 (0.643)	12.241 (0.003)***
N	2283	2283	127	2283
R square	0.008	0.017	0.012	0.017

The regression table shows the unstandardized coefficients and (P-values) for changes in dividend, repurchases and the total payout. The sample contains listed firms from The Netherlands, Germany and the UK in the period 2010-2014. Industries with SIC codes 4900-4949 and 6000-6999 are excluded from the sample. *, **, *** indicate significance at the 10%, 5% and 1% respectively. Furthermore, the number of observations and the R square are provided.

shocks and share repurchases cannot be concluded. The Δ growth opportunities, Δ leverage ratio and Δ firm size show positive coefficients of 0.096, 0.006 and 0.979 respectively. Δ Earned/contributed capital mix and Δ cash holdings have negative coefficients of -0.003 and -2.273. None of the control variables appear to be statistically significant in respect to share repurchases. The R square for share repurchases is 0.012, which is again quite low.

The last payout variable of the regression analysis is the total payout change. The regression model with the total payout variable yielded similar results as the ΔDIV2 variable. Cash flow shocks display an even stronger positive relationship with total payout change, considering the coefficient of 12.241. The p value of 0.003 represents statistical significance at the 1% level. Therefore, hypothesis 1c is accepted and a positive relationship between cash flow shocks and total payout change is concluded. Similarly to ΔDIV2, the Δ earned/contributed capital mix and Δ leverage ratio show negative coefficients of -0.202 and -0.122 with statistical significance at the 5% and 1% level respectively, whereas Δ firm size produces a very strong positive relationship of 4.337 at the 1% significance level. Δ Growth opportunities and Δ cash holdings shows statistically insignificant coefficients of -0.190 and -5.186. The R square of 0.017 illustrates weak predictive power, similar to the other regression models.

Table 5
One-way ANOVA results

		Mean square	F
Cash flow shock	Between groups	299.128	1.254
Permanence	Within groups	259.515	(0.331)
Operating	Between groups	0.037	6.549*
cash flow	Within groups	0.004	(0.000)
Non-operating	Between groups	0.049	9.454*
cash flow	Within groups	0.005	(0.000)

This table shows the results of the one-way ANOVA test. The mean squares of variation between groups and within groups are presented, along with the corresponding F statistics and p values in parentheses. Definitions of variables can be found in the footnote of table 1. * indicates statistical significance at the 1% level.

4.4 ANOVA

A one way ANOVA test was performed on a subsample consisting of firms with positive cash flow shocks along with positive cash flows during the shock. The subsample comprises large dividend increasers, small dividend increasers, repurchasers, firms that utilized both methods and a group of nonpayers. Descriptive statistics for each individual group can be found in table 4, appendix A**.** One-way ANOVA is used to test hypothesis 2 and 3 and could reject hypotheses 2abc and 3 if the test results of differences between groups are not statistically significant. The results of the ANOVA test can be found in table 5.

The hypotheses 2a, 2b and 2c were constructed to see if the methods of payout reflect differences in permanence of underlying cash flow shocks. In other words, firms opt for a certain choice of payout because of their expectations of the permanence of future cash flows. The results show an F score of 1.254 with a p value of 0.331, which indicates that the results are not statistically significant. Thus, the hypothesis that payout choices reflect differences in permanence of underlying positive cash flow shocks is rejected. Differences in cash flow shock permanence between groups cannot be concluded. Therefore, hypotheses 2a, 2b and 2c, are rejected without additional testing between individual groups.

In order to test if dividend increasing firms display relatively higher operating cash flows, whereas repurchasing firms display higher non-operating cash flows and to uncover additional differences between groups, ANOVA was used as well instead of just comparing the two groups. The test yielded F scores of 6.549 and 9.545 for operating cash flows and non-operating cash flows respectively. The corresponding p values of 0.000 suggest that there are differences between the groups. Differences between means for both variables are statistically significant at the 1% level and additional post hoc tests must be performed to see where those differences are located exactly.

4.4.1 *Post-Hoc Mean Comparison*

Hypothesis 3 was tested by means of a Tukey's honestly significant difference (HSD) test. The goal of the test is to see whether dividend increasing firms display relatively higher operating cash flows, whereas repurchasing firms display higher non-operating cash flows. Tukey's HSD test was run for the variables operating cash flows and non-operating cash flows, as both variables need to be tested to answer the hypothesis. These variables were concluded to contain at least differences between two of the groups because of the statistically significant results in the one-way ANOVA test. The post hoc tests are used to identify which groups have significant differences between the means of the aforementioned variables. The results of the Tukey's HSD test can be found in table 6.

The first part of the third hypothesis was constructed to test whether dividend increasers have higher operating cash flows than repurchasers. The results show that large dividend increasers have 0.03 (3%) lower mean of operating cash flows than repurchasers. The p value of 0.070 shows statistical significance at the 10% level. Small dividend increasers have lower operating cash flows of 0.015 (1.5%) with a corresponding p value of 0.858. Contrasting the expectations and flexibility arguments, dividend increasers do not have higher operating cash flows than repurchasers. Large increasers also have lower operating cash flows of 0.013 (1.3%) than firms

Table 6
Tukey's HSD Post-hoc mean comparison matrix

	Operating cash flows				Non-operating cash flows			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Large increasers								
(1)								
Small increasers	-0.007				0.014			
(2)	(0.891)				(0.463)			
Repurchasers	-0.030*	-0.015			0.010	-0.004		
(3)	(0.070)	(0.858)			(0.971)	(1.000)		
Both	-0.030**	-0.023	-0.008		0.003	-0.010	-0.007	
(4)	(0.013)	(0.361)	(0.989)		(0.999)	(0.953)	(0.997)	
Nonpayers	0.044***	0.050***	0.065***	0.074***	-0.075***	-0.089***	0.085***	0.078
(5)	(0.002)	(0.001)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

This table shows the differences in means between groups for the variables operating cash flows and non-operating cash flows. The differences are calculated by columns – rows. Column (5) is left out because it contains no values. *, ** and *** indicates statistical significance at the 10%, 5% and 1% respectively.

who opted for both dividend increases and share repurchases, with statistical significance at the 1% level. Other notable result is that nonpayers display lower operating cash flows than all other groups, with statistical significance at the 1% level.

The second part of the third hypothesis was constructed to test whether repurchasing firms have higher non-operating cash flows than dividend increasing firms. The outcome of the tests shows that large increasers have a 0.014 (1.4%) higher mean of non-operating cash flows than repurchasers. The corresponding p value of 0.991 shows statistical insignificance. Small dividend increasers have 0.004 (0.4%) lower non-operating cash flows than repurchasers, but the p value of 1.000 leads to the conclusion that there are no statistically significant differences between dividend increasers and share repurchasers. Therefore, it cannot be concluded that repurchasers have higher non-operating cash flows than dividend increasers. Thus, the hypothesis that dividend increasing firms display relatively higher operating cash flows, whereas repurchasing firms display higher non-operating cash flows, is rejected. The results show that only nonpayers have significant differences with all other groups. Nonpayers have higher non-operating cash flows than large dividend increasers, small dividend increasers, share repurchasers and firm who both increased dividends and made share repurchasers. All corresponding p values are statistically significant at the 1% level. Nonpayers have significantly lower operating cash flows, as well as significantly higher non-operating cash flows than all other groups. This might indicate that regardless of the method of payout, payout is based on the more permanent operating cash flows.

5. CONCLUSIONS

The goal of this study was to answer the following research question: *"Are cash flow shocks positively related to payout policy alterations?"* by examining firms from The Netherlands, Germany and the UK that made payout alterations during the period 2010-2014. A regression model was build and run for two variables of change in dividend, share repurchases and total payout. Furthermore, the question: "*Does the method of payout signal varying degrees of permanence of cash flow shocks?"* was answered by investigating differences between groups that utilized different methods of payout. Additionally, differences in operating and non-operating cash flows were analyzed to test flexibility arguments.

Based on the results presented in 4.3, there appears to be some controversy regarding hypothesis 1a. The first regression model with dividend changes (ΔDIV) resulted in insignificant results. Therefore the hypothesis that cash flows are positively related to dividend changes is rejected. At least, cash flows shocks do not seem to be positively related to percentage changes in amounts of dividends paid. The regression with the second variable of dividend changes (ΔDIV2), however, did produce statistically significant results. Therefore cash flow shocks do seem to be positively related to changes in the dividends to earnings ratio. Thus, the hypothesis that cash flow shocks are positively related to this variable of dividend changes is accepted. The differences in results may be explained by the early work of Lintner**,** who argued that firms target payout ratios rather than total amounts of dividends, which means that dividends are also dependent on the level of earnings. The hypothesis that cash flow shocks are positively related to share repurchases is rejected due to statistically insignificant results. The last regression was run for the variable Δ total payout, which yielded similar results as the second variable of dividend change. Therefore, the hypothesis that cash flow shocks are related to total payout change is accepted.

The one-way ANOVA resulted in statistically insignificant results for the variable permanence of cash flow shocks. Therefore, it is concluded that there are no differences between the groups and payout choices do not reflect differences in permanence of underlying positive cash flow shocks. Consequently, hypotheses 2a, 2b and 2c are rejected without further testing. The One-way ANOVA did result in statistically significant differences in respect to the variables operating and non-operating cash flows. Therefore, a Tukey's post-hoc test was performed to unveil which groups differ exactly. The post-hoc test showed that firms with large dividend increases have statistically significant lower operating cash flows than repurchasing firms. Firms that made small dividend increases also have lower operating cash flows than repurchasers, although not statistically significant. Therefore, dividend increasers do not have relatively higher operating cash flows than repurchasers. Firms that made large dividend increases have higher non-operating cash flows than repurchasing firms, whereas firms with small dividend increases have somewhat lower non-operating cash flows. Both results were statistically insignificant; hence, the last hypothesis that dividend increasing firms display relatively higher operating cash flows, whereas repurchasing firms display higher non-operating cash flows is rejected.

Overall there seems to be evidence that cash flow shocks have a positive relationship with payout to earnings ratio changes. There is no evidence to support the signaling hypothesis that payout methods indicate differences in the permanence of cash flow shocks. Flexibility arguments are also not supported, as dividend increasing firms do not seem to have higher operating cash flows than share repurchasing firms, and share repurchasing firms do not have higher non-operating cash flows than dividend increasers.

Several factors have potential to manipulate results in terms of statistical significance, which could lead to flawed conclusions. First, the variables are defined in one single way, whereas there are often multiple ways. For example, cash flows are scaled by total assets, but there are several other variables that could be used. Using slightly other definitions may have produced different outcomes and therefore different conclusions. Second, announcements of share repurchases are not necessarily followed by actual repurchases. This means that the sample may contain firms that did not actually repurchase shares. Third, the one-way analysis of variance comprises groups with large variations in size, although the post-hoc test is chosen accordingly, the credibility of the results may still affected. The limitations to this thesis provide opportunities and suggestions for further research regarding these topics. The study could be repeated with different proxies and variables to test robustness of these results. Also, the results show somewhat contradicting results regarding existing research in permanence signaling and flexibility arguments. These topics are, however, subject to controversial literature and further research could contribute to the understanding of these topics. Lastly, the sample was restricted to The Netherlands, Germany and the United Kingdom and could be expanded with additional countries and a larger sample size.

6. REFERENCES

Alli, K. L., Khan, A. Q., & Ramirez, G. G. (1993). Determinants of Corporate Dividend Policy: A Factorial Analysis. *Financial Review*, 28(4), 523-547.

Andres, C., Doumet, M., Fernau, E., & Theissen, E. (2015). The Lintner model revisited: Dividends versus total payouts. *Journal of Banking & Finance*, 55, 56-69.

Bartov, E. (1991). Open-market stock repurchases as signals for earnings and risk changes. *Journal of Accounting and Economics*, 14(3), 275-294.

Benartzi, S., Michaely, R., & Thaler, R. (1997). Do changes in dividends signal the future or the past? *The Journal of Finance*, 52(3), 1007-1034.

Bhattacharya, S. (1979). Imperfect information, dividend policy, and "the bird in the hand" fallacy. *Bell Journal of Economics*, 10(1), 259-270.

Bradley, M., Capozza, D. R., & Seguin, P. J. (1998). Dividend policy and cash-flow uncertainty. *Real Estate Economics*, 26(4), 555-580.

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.

Brook, Y., Charlton, W. T., & Hendershott, R. J. (1998). Do firms use dividends to signal large future cash flow increases? *Financial Management*, 27(3), 46-+.

Chay, J.-B., & Suh, J. (2009). Payout policy and cash-flow uncertainty. *Journal of Financial Economics*, 93(1), 88-107.

DeAngelo, H., DeAngelo, L., & Skinner, D. J. (1996). Reversal of fortune dividend signaling and the disappearance of sustained earnings growth. *Journal of Financial Economics*, 40(3), 341-371.

DeAngelo, H., DeAngelo, L., & Stulz, R. M. (2006). Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. *Journal of Financial Economics*, 81(2), 227-254.

Denis, D. J., & Osobov, I. (2008). Why do firms pay dividends? International evidence on the determinants of dividend policy. *Journal of Financial Economics*, 89(1), 62-82.

Fama, E. F., & French, K. R. (2001). Disappearing dividends: changing firm characteristics or lower propensity to pay? *Journal of Financial Economics*, 60(1), 3-43.

Grullon, G., & Michaely, R. (2002). Dividends, share repurchases, and the substitution hypothesis. *The Journal of Finance*, 57(4), 1649-1684.

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

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.

Ha, I., Hong, G., & Lee, B. S. (2011). Information Content of Dividends and Share Repurchases. *Asia-Pacific Journal of Financial Studies*, 40(4), 517-549.

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.

Lee, B. S., & Rui, O. M. (2007). Time-series behavior of share repurchases and dividends. *Journal of Financial and Quantitative Analysis*, 42(01), 119-142.

Lee, B. S., & Suh, J. (2011). Cash holdings and share repurchases: International evidence. *Journal of Corporate Finance*, 17(5), 1306-1329.

Lie, E. (2005a). Operating performance following open market share repurchase announcements. *Journal of Accounting and Economics*, 39(3), 411-436.

Lie, E. (2005b). Financial flexibility, performance, and the corporate payout choice. *The Journal of Business*, 78(6), 2179-2202.

Lintner, J. (1956). Distribution of incomes of corporations among dividends, retained earnings, and taxes. *The American Economic Review*, 46(2), 97-113.

Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *The Journal of Business*, 34(4), 411-433.

Miller, M. H., & Rock, K. (1985). Dividend policy under asymmetric information. *The Journal of Finance*, 40(4), 1031-1051.

Skinner, D. J., & Soltes, E. (2011). What do dividends tell us about earnings quality? *Review of Accounting Studies*, 16(1), 1-28.

Stephens, C. P., & Weisbach, M. S. (1998). Actual Share Reacquisitions in Open-Market Repurchase Programs. *The Journal of Finance*, 53(1), 313-333.

Vermaelen, T. (1981). Common stock repurchases and market signalling: An empirical study. *Journal of Financial Economics*, 9(2), 139-183.

Watts, R. (1973). The information content of dividends. *The Journal of Business*, 46(2), 191-211.

7. APPENDIX

A: DESCRIPTIVE STATISTICS OF GROUPS

Table 5
Descriptive statistics of groups

		Large increase	Small increase	Repurchasers	both	nonpayer
Permanence	Mean	0.076	1.038	1.001	7.000	0.817
	median	0.0518	-0.054	-0.244	-0.037	-0.001
Operating cash flow	Mean	0.108	0.115	0.130	0.139	0.064
	median	0.095	0.108	0.126	0.120	0.062
Non-operating cash flow	Mean	-0.091	-0.105	-0.101	-0.094	-0.017
	median	-0.082	-0.097	-0.097	-0.100	-0.033
	N	402	95	22	33	32

This table shows the mean and median for each individual group in terms of the variables that were used in the one-way ANOVA test. Moreover, the number of observations of each group is presented. The definitions of the variables can be found in table 1.