The Effects of Financial Constraints on Dividends and Share Repurchases: Empirical Evidence from the Netherlands

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ABSTRACT
This paper investigates the effect of financial constraints on dividend and share repurchases. Former studies found a negative effect for firms in the USA, but with e.g. different law systems and governance mechanisms this study will investigate if those results hold for Dutch firms. With a sample of 500 Dutch listed firms that were listed at least one year during the sample period 2010-2014 a series of multiple regression analyses are conducted. The results show that for the Dutch listed firms in the sample, financial constraints have no significant negative effect on dividend pay-out and share repurchase during the sample period. These results provide empirical support for the earlier findings that managers attach value to the signalling function of dividends and share repurchases, because even a severe event like financial constraints does not give evidence for lower pay-outs and repurchases. The results also give practical implication because more understanding of the behaviour of Dutch firms in times of financial constraints can help reduce information asymmetry that current and future investors often face.

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1. INTRODUCTION

Dividend pay-outs play a crucial role in financial markets; they reflect many facets of a business and can have very distinct functions. They can be a reward for investors, but they can also aim to maximize the value of a firm. They can reflect the past, but also can be a signal of the future. They can reduce information asymmetry but they also reduce corporate liquidity (Brealey, Myers, & Allen, 2014). Dividends and share repurchases are a difficult puzzle. Black (1976, p. 5) states that "the harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together".

Dividends are not the only way to distribute cash to investors; repurchases of own shares are a non-recurring alternative for dividends. In the US repurchases were already a more common phenomenon, although of increasing importance in the last decades (Brealey et al., 2014). In the Netherlands repurchases were less customary due to complicated regulation imposed by the government. Since the change of tax regulations in 2001 and 2006 repurchases are less heavily taxed and firms are allowed to repurchase a higher percentage of their shares. Therefore, repurchases increased over the last years and they are of increasing importance in the Dutch financial market (Kim, Schremper, & Varaiya, 2004).

Next to the functions of dividends and share repurchases there are also various determinants that influence the decision of managers whether to pay dividends or to repurchase shares. One of those possible determinants that will be investigated in this research are financial constraints. Financial constraints occur when a firm is short on internal funds and is not able to attract external funds. As a consequence, the firm is incapable of financing value creating investment opportunities (Kim & Park, 2015) and must choose between worthwhile investments (Brealey et al., 2014).

Former studies in the USA (Chen & Wang, 2012; DeAngelo & DeAngelo, 1990; Pathan, Faff, Méndez, & Masters, 2015) show that financial constraints have a negative effect on dividend pay-out and share repurchases and a negative effect on the returns that follow from these events. Though those studies are useful in understanding the relation between financial constraints and dividend policies in the Netherlands, they are not one-to-one generalizable, e.g. because the Dutch corporate governance models and law system differ from that in the USA. The different tax regulations on repurchases are an example of this. That is why this research aims to find more empirical evidence on the effects of financial constraints on dividend pay-out and repurchases of Dutch publicly listed firms, to contribute to the solution of the dividend puzzle and to investigate if managers of Dutch firms make another trade-off between investing or maintaining dividends than managers of American firms.

To verify whether the earlier findings for effects of financial constraints on dividend pay-out and share repurchases hold for Dutch publicly listed firms the following research question is formulated for this paper:

What are the effects of financial constraints on dividend pay-out and share repurchases for Dutch publicly listed firms?

To find an answer to this research question a multiple regression analysis is applied to a sample of 500 firm years. The firms included in the sample were listed at least on year during the sample period 2010-2014 and are located in the Netherlands. The results show, conflicting with the expectations, that for the Dutch listed firms in this sample, financial constraints have no significant negative effect on dividend pay-out and share repurchases during the sample period. These results provide empirical support for the findings of Black (1976) and Almeida et al. (2016) that managers adhere to the signalling value of dividends and repurchases. Therefore this research is an addition to the existing literature on financial constraints, dividends and share repurchases. Practical implication for investors that follow from the results are more understanding of the behaviour of Dutch firms in times of financial constraints. This can help reduce information asymmetry that current and future investors often face.

The remainder of this paper is structured as follows. Section 2 consists of the theoretical framework, where the main theories on dividends, repurchases and financial constraints are covered, pursued by the development of the hypotheses. The third section will explain the methodology used to test the hypotheses. Section 4 presents the descriptive statistics, followed by the bivariate correlations and the regression results. Then the scientific and practical implications followed by the limitations of the research are addressed in section 5. Finally, in section 6, the conclusion for this research and recommendations for future research are presented.

2. THEORETICAL FRAMEWORK

2.1 Theories on financial constraints

When a firm is financially constraint, it is incapable of financing value creating investment opportunities (Kim & Park, 2015). Those constraints are caused by a shortage of internal funds and the inability of a firm to attract more external funds. This shortage of fund forces a company to choose between worthwhile investments (Brealey et al., 2014).

This incapability to acquire attractive investment opportunities can hinder a firm to grow, to expand operations or to earn from the investment. These are direct consequences for a firm but financial constraints can also have indirect effects. Firms that are financially constrained face higher levels of information asymmetry, agency issues, (Pathan et al., 2015), lower tech spending and deeper cuts in employment (Campello, Graham, & Harvey, 2010).

With this definition of financial constraints all firms are likely to be classified as constraint to some extent (Kaplan & Zingales, 1997). That is why financial constraint is a relative measure, meaning that a firm only can be more or less constrained than another firm. There are several ways to measure financial constraints, these measures can be grouped in three sub categories.

The first subcategory are the index-based measures. The KZ-index, the SA-index and the WW-index are the most used indexes to measure financial constraints (Kim & Park, 2015). The KZ-index is described by Lamont, Polk & Saa-Requejo (2001) from a sample of Kaplan & Zingales (1997). It is a model based on five factors that, according to the sample, correlate with financial constraints. Those five factors, together with their type of correlation in parentheses, are cash flow to total capital (negative), market to book ratio (positive), debt to total capital (positive), dividends to total capital (negative) and cash holdings to capital (negative). The SA-index is a model based on the natural log of total assets and years of listing, both negatively correlated with financial constraints, described by Hadlock & Pierce (2010). Lastly, the WW-index is a six-factor index based on the Euler equation (Whited & Wu, 2006). The six factors, together with their type of correlation in parentheses, are cash flow to total assets (negative), a dummy variable that takes the value of 1 if a firm pays cash dividends (negative), long term debt to total assets (positive), the natural log of total assets (negative), the industry sales growth (positive) and the firms sales growth

(negative). Those indexes are easy to apply and use. However, they all rely on a relative small sample and the classification scheme for constraints is subjective. Moreover, the KZ-index does not correlate with the SA- and WW-index (Hadlock & Pierce, 2010; Whited & Wu, 2006), which casts serious doubts on the reliability of the measures.

The second subcategory consists of sensitivity measures. The first sensitivity measure is of Almeida, Campello & Weisbach (2004) which captures the firm's inclination to save cash out of cash flows. They made a model based on this cash-cash flow sensitivity which they think is also higher for constrained firm. For the cash-cash flow sensitivity as a measure of financial constraints there is mixed empirical evidence, because some studies found that this sensitivity measure is always significantly positive, irrespective of the degree of constraint (Pal & Ferrando, 2010). The second sensitivity measure is constructed by Fazzari, Hubbard, Petersen, Blinder & Poterba (1988). They analyse the effect of changes in costs of internal and external financing on investment decisions. They constructed a model based on this investment-cash flow sensitivity, which they think is higher for constrained firms. However, the investment-cash flow sensitivity, based on pay-out ratio, is heavily criticized. This is because pay-out ratio is biased by a firm's overall corporate and financial policy. A firm might, for example aim to keep dividend pay-outs stable, because they do not want to give a negative signal to investors.[1] Therefore dividends are a not a reliable determinant for financial constraints (Brav, Graham, Harvey, & Michaely, 2005; Kaplan & Zingales, 1997; Kaplan & Zingales, 2000), neither for the sensitivity measures as well for the index based measures.

Because of the drawbacks of the former two measures, firms can also be classified by univariate firm-level measures. They are derived from theoretical assumptions on the relationship between financial constraints and the specific measure. This is the third way to measure financial constraints. The main advantage is that those firm-level measures are widely available and easy to implement.

The first firm-level measure is firm size. Numerous studies have found a negative relation between size and financial constraints (Whited & Wu, 2006; Hadlock & Pierce, 2010; Devreux & Schiantarelli, 1990). Barclay & Smith (1996) state that this is because larger firms benefit from economies of scale in costs of external financing, e.g. lower transaction costs, and therefore can easier attract external financing.

The second firm-level measure is firm age. The age of a firm is negatively correlated to financial constraints because older firms are better known, have a better track record and therefore can easier attract external finance (Devreux & Schiantarelli, 1990; Hadlock & Pierce, 2010). The drawback of this measure is that there are different frameworks for measuring firm age, for example date of formation or date of incorporation on a stock market. This can make it hard to compare empirical findings. Another drawback is that young firms are classified as constraint were this may not always be the case.

Another firm-level measure, that measures internal financing ability, is liquidity. Firms that have a higher liquidity are better capable of financing investment opportunities from internal sources (Cleary, Povel, & Raith, 2007), that makes liquidity negatively correlated to financial constraints. However, Almeida et al. (2004) argue that financially constrained firms may hold larger reserves of cash because of restricted access to external financing.

Investment in plant, property and equipment (PP&E) are investments with certain outcome and can be used as collateral to attract more external financing (Hall, 2002). Thus, PP&E expenditure is negatively correlated to financial constrained. However, firms with no PP&E, such as online businesses, are classified as constrained where this may not always be the case.

On the contrary, research and development (R&D) investments have a more uncertain outcome. That is why it may be harder for firms that spend more on R&D to attract external financing for those projects (Hall, 2002). That makes R&D expenditure another firm-level measure. It is positively correlated to financial constraints. A disadvantage of this measure is that firms with low or zero R&D expenditure are all classified as unconstrained, where this may not always be the case.

Cost of debt is the next firm-level measure. High cost of debt can indicate that a firm has debts with high interest rates. Consequently, it is possible that current creditors demand debt covenants that restrict the future use of debt (Chave & Roberts, 2008) and that new creditors do not want to provide new debts or only against high interest rates (Whited, 1992). Thus, costs of debt are positively correlated to financial constraint.

The last firm-level measure for financial constraints is credit rating. It represents the creditworthiness, assessed by an external agency[2]. This credit rating is often used by creditors when considering issuing a new loan, and firms with a higher credit rating have a higher access to external financing (Whited, 1992). It is negatively related to financial constraints. However, with this measure firms that are not rated are classified as constrained where this may not always be the case.

For the index-based and sensitivity analyses there are serious doubts about the reliability of these measures for financial constraints. For the firm-level measures there is doubt about the validity of the individual measures, because scoring high on one of those measures does not necessarily mean that a firm is constrained or unconstrained, this is especially the case for the measures age, R&D expenditure, PP&E expenditure and credit rating. However, using all those univariate firm-level measures in one model can strengthen the validity of the individual measures, because the firm-level measures altogether cover a broad part of the spectrum of financial constraints.

2.2 Theories on dividends

Earnings of a firm can be reinvested in the firm or paid out as dividends. In the scientific field there are several theories on the relevance of dividend.

The Miller-Modigliani theorem (MM) (Miller & Modigliani, 1961) describes that if a firm pays out dividend, investors enjoy dividend and if a firm retains earning investors enjoy capital appreciation equal to the retained earnings. That would mean that the dividend pay-out of a company is irrelevant to the value of its shares and the returns to investors. This would make cutting dividend one of the lowest cost sources to raise capital, because costs for issuing new equity are several percent of the total amount of raised money and attracting debt brings interest costs (Black, 1976). However, MM states that dividend is only irrelevant when all the assumptions of the model are met. Those assumptions are a completely efficient market e.g. without taxes, without information asymmetry, without distress costs and with

[1] More information of this signaling theory can be found in section 2.2

[2] An example of external credit rating agencies are Standard & Poor's and Moody's

rational investors. Those assumptions of a perfect markets are hardly ever realized in today's markets.

In those imperfect markets, there are two factors of dividend that are relevant to investors, the height of and the change in dividends. The relevance of the height of dividends is captured in the clientele theory. The clientele theory states that different maturity level and pay-out policy will attract different types of investors (Pettit, 1977). From this theory two types of investors can be distinguished; the left-wing and the right-wing creed. The left-wing creed states that if taxes on dividends are higher than taxes on capital gains firms should pay the lowest dividend possible and retain the rest of the free cash flow (Brealey et al., 2014). Left-wing investors often have a low pay-out/high future growth portfolio (Pettit, 1977). However, the difference in taxation of dividend and capital gains is declining (Brealey et al., 2014). The right-wing creed states that real-world imperfections make high dividend pay-out ratios better than low ones and that it prevents managers from wasting funds if no proper investments are available (Easterbrook, 1984). Whereas Shefrin & Statman (1984) state that preference for regular cash just comes from an unfounded temptation where many people give in to. Right-wing investors often have a high pay-out/low future growth portfolio (Brealey et al., 2014).

The second relevant factor of pay-out policy is the change of dividend. The signalling theory states that dividends are a tool to signal information to investors (Simiyu, 2014). That is why managers do not like to cut dividends; it gives a negative signal. They also will only raise dividends if the prospects are good enough to maintain that level of dividends for some time and will only lower dividends if they think that prospects for a quick recovery are poor (Black, 1976). This means that dividend changes may tell investors more about manager's thoughts on the results or prospects of the firms than other sources, (Black, 1976) e.g. stock data or shareholders' meeting, and therefore reduces information asymmetry. This is also backed up by Pathan et al. (2015) who state that dividend paying firms face less information asymmetry.

2.3 Theories on repurchases

Another way for a firm to pay out cash to investors is by buying back its own outstanding shares, this is called a buy-back or a repurchase. During the late 20th century share repurchases were of growing importance, but since the new century the value of share repurchases in the US is equal to the total value of dividends (Brealey et al., 2014). In the Netherlands repurchases were not allowed and when they were allowed they were still uncommon for a long time because of harsh tax regulations. In 2001 taxes on repurchases were reduced. This made repurchases more attractive. Dutch firms needed approval for a buyback program at the shareholder meeting, which is valid for 18 months and no more than 10% of the shares outstanding can be bought back (Kim et al., 2004). In 2006, the legislation was liberalized even more; Dutch firms are permitted to repurchase 50% of their outstanding shares and the validity of the approval is extended to 5 years.[3]

There are several reasons for a firm to buy back its own shares. Those reasons are different from the decision to increase dividend because share repurchases are non-recurring, where dividends are (Brickley, 1983). The first reason to repurchase shares is to distribute excess cash to shareholders without increasing dividends (Dittmar, 2000). The second reason is to signal strong future performance (Lie, 2005). The information content of a repurchase announcement is less positive than the announcement of dividend increase (Brealey et al., 2014) but the average market reaction is more positive (Lie, 2000). The third reason for managers to repurchase shares is because they believe their firm is under valuated and want to signal this to their shareholders (Comment & Jarrel, 1991; Vermaelen, 1981).

The increasing importance of repurchases are an argument of the left-wing creed against the believes on dividends of the right-wing creed. The right-wing creed states that dividends prevent managers from wasting funds if no proper investments are available (Easterbrook, 1984). The left-wing creed states that buybacks are a more effective method to prevent managers from wasting funds, because if no proper investments are available a firm can repurchase shares, which are non-recurring (Brealey et al., 2014).

2.4 Hypotheses development

A firm has three options with respect to its dividends; cut, maintain or increase dividend pay-out. And two options for share repurchases; postpone or execute share repurchases.

The first option is to cut or omit dividend payments and to postpone share repurchases to retain more of the firm's earnings. Campello et al. (2010) found empirical evidence that financial unconstrained firms in the USA plan significantly smaller dividend cuts than constrained firms. This is backed up by the empirical research of DeAngelo &DeAngelo (1990) who show that many financially distressed[4] firms in the USA radically reduced or omitted dividends multiple times during the 1980s recession. But lowering dividends will have consequences, the share price will drop and that information asymmetry will increase because shareholders will view the dividend change as a negative signal for the future expectation of the firm (Black, 1976). Postponing dividend will not give this negative signal because a repurchase has a non-recurring nature. The only consequence is that it will not have the advantages, e.g. the positive signal of future prospects (Lie, 2005), that follow from repurchases.

To not have this negative consequence a constrained firm can choose to maintain the dividends on the current level with the consequence that it cannot participate in profitable investments and that this has consequences for their future operations. But the advantage of maintaining dividends is that a stable dividend pay-out gives a good signal to investors (Simiyu, 2014).

The last option is to increase dividends or execute share repurchases. This will reduce corporate liquidity further and therefore available internal funds for investment. Constrained firms that choose to repurchase shares or to increase their dividend pay-out showed different performance than unconstrained firms who increased dividends and repurchased shares. Financially constrained firms in the USA experienced significantly poorer operating performance after the dividend increase (Pathan et al., 2015) and financially constrained firms in the USA that repurchase shares show poorer post-buyback abnormal returns and operating performance than unconstrained firms (Chen & Wang, 2012).

[3] Article 98 of the Dutch Civil Law Code

[4] Financial distress and financial constraints differ; a financially distressed firm is in need of securing funds to prevent default where financially constraint firms are incapable of financing value creating investment opportunities. However, Kim & Park (2015) found that financial constraints correlates with financial distress. That is why effects of financial distress on dividend can also be an indicator for effects of financial constraints on dividend.

If increasing dividends or repurchasing shares has negative consequences, then why would a firm do this? A reason for constrained firms to increase dividends might be to give a signal to investors for good future prospects and thereby conceal the constraints in the hope that it will become a self-fulfilling prophecy. An example of this is given by Pathan et al. (2015), who find empirical evidence that constrained firms time their dividend increase to precede a seasoned equity offering (SEO), because returns after a SEO are more positive when investors expect growth potential. This expected growth potential can be found in the increase in dividends which signals a good future prospect. A reason for constrained firms to repurchase shares can also be found in the signalling theory, even though the information content is less strong for repurchases (Brealey et al., 2014) and not repurchasing does not give a negative signal because of its non-recurring nature. Empirical evidence for this is given by Almeida, Fos & Kronlund (2016). They found that firms are willing to trade off employment and investment for stock repurchases that allow them to meet forecasts on earnings per share. Managers might fear that not meeting the forecast is a negative signal to investors.

To conclude, there is empirical evidence that the signalling theory keeps managers from cutting dividends or postpone share repurchases and sometimes even compels managers to increase dividends. However, other findings are that US financially constrained firms cut dividend pay-outs significantly more than unconstrained firms while under normal conditions firms prefer to maintain or increase dividend and that constrained firms that repurchase shares or increase dividends have significant poorer operating performance. These findings, together with financial constraints being a severe event leads to the following hypotheses:

H1: Financial constraints have negative effects on dividend pay-out of Dutch listed firms

H2: Financial constraints have negative effects on share repurchases of Dutch listed firms

3. METHODOLOGY & DATA

3.1 Methodology

3.1.1 Analysis

Both hypotheses will be tested by conducting a bi- and multivariate analysis. A bivariate analysis will be executed by means of a Pearson's correlation test. This is done to test the level of multicollinearity between the dependant, independent and control variables. Further, to test both hypotheses will be tested by conducting a multivariate regression analysis. A mean to ensure and increase the validity of the regression models will be the use of White's heteroscedasticity-consistent standard errors (White, 1980), to assure that the homoscedasticity assumption of regression models is met. To test hypothesis H1 the following multiple regression model is constructed. Consisting of six univariate variables that indicate financial constraints and three control variables for the dependant variable.

$$DPR_{t0} = \alpha_0 + \beta_1 Size_{t-1} + \beta_2 Age_{t-1} + \beta_3 Liq_{t-1} + \beta_4 PP\&E_{t-1} - \beta_5 R\&D_{t-1} - \beta_6 CoD_{t-1} + \beta_7 Mat_{t-1} + \beta_8 Prof_{t-1} - \beta_9 GrOp_{t-1} \quad (1)$$

To test hypothesis H2 the following multiple regression models are constructed. Consisting of the same six univariate variables and three control variables as the first model.

$$BBR_{t0} = \alpha_0 + \beta_1 Size_{t-1} + \beta_2 Age_{t-1} + \beta_3 Liq_{t-1} + \beta_4 PP\&E_{t-1} - \beta_5 R\&D_{t-1} - \beta_6 CoD_{t-1} + \beta_7 Mat_{t-1} + \beta_8 Prof_{t-1} - \beta_9 GrOp_{t-1} \quad (2)$$

$$BBR\text{-}0_{t0} = \alpha_0 + \beta_1 Size_{t-1} + \beta_2 Age_{t-1} + \beta_3 Liq_{t-1} + \beta_4 PP\&E_{t-1} - \beta_5 R\&D_{t-1} - \beta_6 CoD_{t-1} + \beta_7 Mat_{t-1} + \beta_8 Prof_{t-1} - \beta_9 GrOp_{t-1} \quad (3)$$

The dependant, independent and control variables as well as the expected relations will be described below. All monetary values are expressed in euros.

3.1.2 Dependent variables

DPR represents the first dependent variable; the dividend pay-out ratio. It is calculated by dividing the total cash dividends paid, derived from the cash flow statement, divided by the total net earnings, derived from the profit and loss (P/L) statement, both in year t0 and expressed in €.

BBR, the second dependent variable, represents the buyback ratio. It is calculated by dividing the number of shares repurchased by the weighted average number of outstanding shares in year t0, both derived from the annual report.

BBR-0 represents the third dependant variable. It is a subsample of *BBR*, were the observations were the number of shares repurchased equals zero are removed. This is because only a small number of firms actually repurchased shares, and therefore the data of *BBR* is highly skewed. It may be interesting to see if model 2 and 3 therefore reveal different results.

3.1.3 Independent variables

Because of the doubt on reliability of the index and sensitivity measures, financial constraints will be measured by all univariate firm-level measures mentioned in section 2.1 except for credit rating. This is because there are various credit rating agencies that assign different ratings to firms and because those ratings are not available in the used database. Deriving credit ratings for all firms and from all agencies would be too complicated for this research.

Size is a variable that represents the size of the firm. It is represented by the natural logarithm of the sample firm's total revenue in thousands in year t-1, derived from the P/L statement. Firms that have a higher revenue are expected to be less constrained and the expected relationship between size and the dependant variables is therefore positive.

Age represents the natural logarithm of the total years of incorporation on a stock market of the sample firm in year t-1, derived from the annual report. Firms that are longer listed are expected be less constrained and therefore expected relationship between age and the dependant variables is positive.

Liq is a variable that represents the sum of all cash and cash equivalents divided by total assets of the firm in year t-1, both derived from the balance sheet. Firms with more liquid assets are expected to be less constrained and thus the expected relationship with the dependant variables is positive.

PP&E represents the total value of tangible fixed assets divided by total assets in year t-1, both derived from the balance sheet. A firm that has more tangible fixed assets in considered less constrained, consequently a positive relationship is expected between PP&E and the dependant variables.

R&D is the variable that represents the total R&D expenditure divided by total earnings in year t-1, both derived from the P/L statement. A firm that spends more money on R&D is considered more constraint and thus the expected relationship with the dependant variables is negative.

CoD represents the total cost of debt in year t-1. It is calculated by dividing the interest paid in year t-1 by the total liabilities and debt in year t-2, derived from the P/L statement and balance sheet respectively. Firms that have higher cost of debt are considered more constraint and therefore the expected relationship with the dependant variable is negative.

3.1.4 Control variables

Mat represents the maturity of the firm in year t-1. It is calculated by dividing the retained earnings by the total equity in year t-1, both derived from the balance sheet. Firms that are more mature tend to pay-out more dividend and repurchase more shares because they have less investment opportunities (Gordon, 1962; Pettit, 1977; Walter, 1963; von Eije & Megginson, 2008), thus the expected relationship with the dependant variables is positive.

Prof is a variable that represents the profitability of a firm. It is calculated by dividing the net income by the total assets of a firm in year t-1, derived from the P/L statement and the balance sheet respectively. Firms that are more profitable tend to pay-out more dividends (Denis & Osobov, 2008) and repurchase more shares (Andriosopoulos & Hoque, 2013), because they have more excess cash to distribute to investors. Consequently, the expected relationship with the dependant variables is positive.

GrOp is a variable that represents the growth opportunities of a firm. It is calculated by dividing the market capitalization by total assets in year t-1, derived from stock data and the balance sheet respectively. Firms that have more growth opportunities tend to pay lower dividends (Denis & Osobov, 2008; Gordon, 1962; Walter, 1963) and repurchase more shares, thus the expected relationship with the dependant variables is negative.

3.2 Data collection

For the data collection of this sample the ORBIS database is utilized. Dutch firms that were listed at least one year in the sample period, 2010 till 2014, and are located in the Netherlands are included in the sample. This led to a sample including 2265 firm years. For those firm years the data for the dependant, independent and control variables are derived from Orbis, except for the number of weighted average shares outstanding and the number of shares repurchased. Those are manually added and derived from annual reports and buyback announcements. Firm years of which no data is available in Orbis, or firm years of financial firms, are excluded from the sample. This leads to a final sample containing 500 firm years. The firm years are evenly distributed over the sample period, the number of firms per sample year varies from 93 to 105.

Table 1. Descriptive statistics

Panel A: The original sample (t = 2010 – 2014)						
	N	Mean	Median	SD	Min	Max
DPR_t	368	0.555	0.245	2.842	-10.000	38.000
BBR_t	356	0.008	0	0.024	0	0.234
$BBR\text{-}0_t$	106	0.026	0.015	0.037	0.000	0.234
$Size_{t-1}$	481	13.523	13.702	2.108	4.127	18.278
Age_{t-1}	485	4.300	3.932	1.854	0	7.607
Liq_{t-1}	483	0.105	0.071	0.116	0.000	0.942
$PP\&E_{t-1}$	483	0.575	0.577	0.218	0.015	0.999
$R\&D_{t-1}$	475	0.022	0	0.066	0	1.100
CoD_{t-1}	337	0.038	0.023	0.066	0.000	0.834
Mat_{t-1}	392	-0.731	0.208	9.606	-142.312	4.250
$Prof_{t-1}$	490	0.039	0.040	0.127	-1.012	0.685
$GrOp_{t-1}$	359	0.989	0.668	1.264	0.004	11.961
Panel B: The sample with outliers excluded (t = 2010 – 2014)						
	N	Mean	Median	SD	Min	Max
DPR_t	332	0.269	0.231	0.340	-0.659	1.219
BBR_t	289	0.000	0	0.001	0	0.006
$BBR\text{-}0_t$	98	0.018	0.014	0.018	0.000	0.071
$Size_{t-1}$	462	13.591	13.739	1.999	8.363	18.278
Age_{t-1}	467	4.275	3.912	1.842	0	7.607
Liq_{t-1}	447	0.087	0.066	0.074	0.000	0.313
$PP\&E_{t-1}$	467	0.574	0.577	0.218	0.015	0.999
$R\&D_{t-1}$	380	0.002	0	0.006	0	0.027
CoD_{t-1}	300	0.024	0.022	0.016	0.000	0.072
Mat_{t-1}	327	0.310	0.256	0.399	-0.845	1.407
$Prof_{t-1}$	411	0.039	0.041	0.056	-0.105	0.183
$GrOp_{t-1}$	323	0.679	0.635	0.407	0.004	1.945

This table provides summary statistics for the variables used in this research. It displays the number of observations, the mean, the median, the standard deviation and the minimum and maximum value of the dependent, independent and control variables. Panel A shows the descriptive statistics of the sample and panel B shows the descriptive statistics of the sample from which the outliers are excluded. The outliers are excluded following the 1.5*IQR Rule. DPR is measured by dividing the total cash dividends by total net earnings. BBR is measured by dividing the number of shares repurchased by the total number of shares outstanding. BBR-0 is measured by dividing the number of shares repurchased (with the non-buybacks excluded) by the total number of shares outstanding. Size is measured by the natural logarithm of the total revenue in thousands. Age is measured by the natural logarithm of the total listed years. Liq is measured by dividing the total of cash and cash equivalents by the total assets. PP&E is measured by dividing the total fixed assets by total assets. R&D is measured by dividing the total R&D expenses by the total revenue. CoD is measured by dividing the total interest paid by total liabilities and debt. Mat is measured by dividing the retained earnings by the shareholders' equity. GrOp is measured by dividing the market capitalization by the total assets. Values of zero with precision digits are values that are rounded off, values of zero without precision digits are integer values.

Table 2. Pearson's Correlation Matrix

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
DPR	[1]	1											
		(332)											
BBR	[2]	0.079	1										
		(156)	(289)										
BBR-0	[3]	-0.066	0.999***	1									
		(69)	(39)	(98)									
Size	[4]	-0.020	0.064	0.262***	1								
		(318)	(281)	(98)	(462)								
Age	[5]	0.066	0.056	-0.066	0.020	1							
		(318)	(283)	(94)	(450)	(467)							
Liq	[6]	0.043	-0.110	0.204*	0.106**	-0.213***	1						
		(314)	(269)	(92)	(436)	(436)	(447)						
PP&E	[7]	-0.026	0.109	0.042	0.110**	0.033	-.0346***	1					
		(324)	(283)	(96)	(455)	(455)	(447)	(467)					
R&D	[8]	0.004	-0.024	0.053	0.124**	0.043	0.094*	-0.065	1				
		(258)	(243)	(59)	(376)	(369)	(369)	(379)	(380)				
CoD	[9]	-0.108	-0.122	0.103	-0.041	-0.124**	-0.064	0.324***	0.011	1			
		(203)	(202)	(83)	(297)	(292)	(294)	(300)	(246)	(300)			
Mat	[10]	0.121*	-0.022	0.193*	0.221***	-0.021	0.077	-0.096*	-0.043	-0.192***	1		
		(224)	(224)	(80)	(320)	(318)	(317)	(327)	(260)	(258)	(327)		
Prof	[11]	0.450***	-0.187***	0.156	-0.032	-0.043	0.202***	-0.146***	-0.062	-0.088	0.080	1	
		(284)	(249)	(90)	(405)	(402)	(395)	(406)	(335)	(270)	(297)	(411)	
GrOp	[12]	0.217***	0.275***	0.070	0.051	-0.044	0.095*	0.030	0.168***	-0.007	0.171***	0.499***	1
		(192)	(254)	(84)	(317)	(317)	(305)	(317)	(263)	(239)	(259)	(291)	(323)

This matrix shows the correlation between the dependant, independent and control variables used in this research. The number of observations are in parentheses.

***, **, * Correlation is significant at the 0.01, 0.05, 0.1 levels respectively (2-tailed).

Table 3. Multiple regression analysis results

	Exp.	[1] DPR	[1] DPR	[2] BBR	[2] BBR	[3] BBR-0	[3] BBR-0
Constant (α)		-0.303	-0.562**	-0.001	0.000	-0.048	-0.053***
		(0.308)	(0.034)	(0.460)	(0.710)	(0.110)	(0.004)
Size	+	0.030	0.042	$1.985E^{-5}$	$-2.366E^{-5}$	0.002	0.006***
		(0.305)	(0.106)	(0.715)	(0.726)	(0.303)	(0.009)
Age	+	0.010	0.016	$2.683E^{-5}$	$6.050E^{-5}$	0.003	-0.013**
		(0.762)	(0.628)	(0.712)	(0.386)	(0.498)	(0.050)
Liq	+	-0.230	-0.017	0.000	$-1.075E^{-5}$	0.086	0.176**
		(0.650)	(0.972)	(0.774)	(0.994)	(0.242)	(0.022)
PP&E	+	0.169	0.019	0.001**	0.001**	0.011	0.073***
		(0.394)	(0.928)	(0.017)	(0.023)	(0.604)	(0.008)
R&D	-	0.663	0.455	-0.020	-0.009	0.150	-1.213
		(0.907)	(0.939)	(0.272)	(0.653)	(0.840)	(0.342)
CoD	-	-3.644	-4.744**	-0.015**	-0.010	0.256	0.308*
		(0.141)	(0.049)	(0.048)	(0.196)	(0.107)	(0.059)
Mat	+	0.050	0.217**	$8.249E^{-5}$	0.000	-0.003	0.005
		(0.515)	(0.022)	(0.864)	(0.491)	(0.755)	(0.505)
Prof	+	1.659*	1.828*	0.002	0.003	0.053	0.043
		(0.052)	(0.068)	(0.405)	(0.425)	(0.515)	(0.492)
GrOp	-	-0.006	-0.071	0.000	0.000	0.002	-0.023**
		(0.964)	(0.635)	(0.161)	(0.428)	(0.846)	(0.050)
Year Dummies		No	Yes	No	Yes	No	Yes
Industry Dummies		No	Yes	No	Yes	No	Yes
Adjusted R^2		0.088	0.110	0.052	0.046	0.098	0.344
N		103	103	120	120	39	39

The table shows the regression results for the sample of Dutch listed firms. DPR, BBR and BBR-0 are the dependant variables of the first, second and third regression respectively. The expected relationship, the adjusted R^2 and the number of observations are displayed and the p-values are included in parentheses.

***, **, * Correlation is significant at the 0.01, 0.05, 0.1 levels respectively (2-tailed).

4. EMPIRICAL RESULTS

4.1 Descriptive statistics

The original sample contains outliers. To realise a valid sample those values are excluded. The outliers are excluded by using the 1.5*IQR Rule. The interquartile range (IQR) is the range between the 1st and 3rd quartile of the sample. All values that are more than 1.5 times the IQR below the 1st, or above the 3rd quartile are removed from the sample. The 1.5*IQR Rule is a statistical approach used to exclude outliers (Huizingh, 2007).

The descriptive statistics of the original sample and of the sample with outliers excluded are presented in table 1. All means and medians in panel B show less discrepancy than in panel A, except for *PP&E* and *Prof* who show a negative difference of 0.001 relative to panel A. This indicates a less skewed dataset. Another contrast of panel A and panel B, is that *DPR, R&D, Mat* and GrOp have exceptional lower standard. deviations in panel B. This can also be seen in the difference in the lowest and highest values. This indicates a more valid dataset.

The non-buybacks and the non-payouts are included for the sample of the dependent variables *DPR* and *BBR* respectively. In panel A as well as in panel B, there are 12 non-payouts included for *DPR* and 250 non-buybacks for *BBR*. Another conspicuous matter is that of the 475 observations of the independent variable R&D 284 observations have the value of zero.

4.2 Bivariate correlation

Table 2 presents the bivariate Pearson's correlations between all variables that are used in the regression models. *BBR* and *BBR-0* have the highest possible correlation of approximately 1. This is because BBR-0 is a subsample of BBR, as explained in section 3.1.2. Since they are not tested in the same model, this does not give any complications. Other high, significant correlations are found between *Size* & *BBR-0, GrOp* & *BBR, PP&E* & *Liq, CoD* & *PP&E, Prof* & *DPR*, and *GrOp* & *Prof*. For the last four this is not surprising since they are all calculated by dividing by total assets. According to Miles & Shevlin (2001) a Variance Inflation Factor (VIF) score, a measure for multicollinearity, equal to four is used as an arbitrary cut-off that indicates when multicollinearity is too strong and can influence the validity of the regression analysis. The highest VIF score in the three regression models used in this research is 3.436, which means that the multicollinearities in these models are not precarious.

4.3 Regression results

4.3.1 Fixed effects

To ensure and increase the validity and the robustness of the results of the regression dummies variables are added for the different years and different industries. For year, dummies are added for n-1 sample years. For industries, the 1-digit SIC code is used to classify industries. This 1-digit SIC code varies from zero to nine, and the number of firm years per industry varies from 29 to 104. Dummies are added for n-1 industries. These dummies control for fixed effects of time and industries in the data.

Table 3 presents the results of the regression analysis with and without the year dummies. An important difference between the results with and without year dummies is the value of the adjusted R^2, which captures the predictive power of the model. For model 1 and 3 the adjusted R^2 is higher when the dummies are included, the opposite applies for model 2. Another difference between the results with and without year dummies is the adjustment of some significant value. For model 1 the constant, the coefficient of *CoD* and the coefficient of *Mat* have become significant at the 0.05 level. For model 2 the coefficient of *CoD* has lost its significance. Lastly, for model 3 the constant, the coefficient of *Size* and the coefficient of *PP&E* have become significant at the 0.01 level, the coefficient of *Age*, *Liq* and *GrOp* have become significant at the 0.05 level and the coefficient of *CoD* has become significant at the 0.1 level. The further analysis of the results will be based on the models with dummies included.

4.3.2 Dividend pay-out

The first regression model, used to test hypothesis H1, is presented in column 1 of table 3. The hypothesis H1 expects that financial constraints have negative effect on dividend pay-out, where financial constraints are measured by six firm-level measures and dividend pay-out by the dividend pay-out ratio.

The model has limited predictive ability since it only accounts for 11% of the variation in the dividend pay-out ratios. However, it is questionable if this is precarious, because for a similar research on the effect of financial constraints on dividends (Pathan et al., 2015) the predictive power of different models varies between 1.08% and 7.3%.

Moreover, hypothesis H1 is not supported by the other results in the model. It appears from the model that only one of the coefficient of the measures for financial constraints, CoD, has significant influence on the dividend pay-out ratio. The coefficient is significant at the 0.05 level and implies that when the costs of debt increases with 1% the dividend pay-out ratio decreases with 4.744%. That costs of debt have a negative effect on dividend pay-out matches with the expected relationship. However, as explained before, only a significant result on one or a few determinants of financial constraints does not necessarily mean that a firm is constrained. Therefore, the model does not provide evidence on the hypothesis. This leads to the rejection of hypothesis H1.

4.3.3 Share repurchases

The results of the second and third regression model, used to test hypothesis H2, are presented in column 2 and 3, respectively. The hypothesis H2 predicts that financial constraints have a negative effect on share repurchases. Where financial constraints are measured by six firm-level measures and share repurchases are measured by the buyback ratio.

The second model has a low predictive ability since it explains only 4.6% of the variance of the buyback ratio. The coefficients for the variables *Size*, *Age*, *Liq*, *R&D* and *CoD* are not significant at the minimal significance level of 0.1. The coefficient of the variable *PP&E* is significant at the 0.05 level and shows that when the value of intangible fixed assets of a firm increases with 1% relative to its total assets, the buyback ratio increases with 0.001%. As for the first model, only a significant on one or a few of the determinants of financial constraints does not necessarily indicate that a firm is constrained. Therefore, it does not give evidence for hypothesis H2.

The third model has a small sample size of 39. It has a moderate predictive ability since it predicts 34.4% of the variance of the buyback ratio where the non-buybacks are left out. This predictive ability can even be observed as high when comparing it with a similar research on the effect financial constraints on repurchases. In the research of Chen & Wang (2012) the predictive power varies between 0.18% and 20%.

Additionally, the coefficient for *Size* and *PP&E* are significant at the 0.01 level, the coefficients for *Liq* and *Age* are significant at the 0.05 level and the coefficient for *CoD* is significant at the 0.1 level. For the variables Size, PP&E and Liq the direction of the coefficient matches the expected relationship. However, for the variables Age and CoD this is not the case. Those coefficients show that when the variables Age and CoD increase with 1% the buyback ratio decreases with 0.013% and increases with 0.308% respectively. With only three of the six independent variables that have a significant relation that matches the expected relationship, the evidence on hypothesis H2 is mixed.

The third model, with a relatively high predictive ability but with a small sample size, provides mixed evidence on the hypothesis.

This together with the results from the second model, that does not give evidence on the hypothesis, leads to the rejection of hypothesis H2.

5. DISCUSSION

In this section some remarks, implications and limitations will be declared with regard to this research and especially with regard to the empirical results.

What is conspicuous from the empirical results is that the coefficients of the variables *Age* and *CoD* have a significant effect on the buyback ratio that is opposite of the expected relationship. A possible explanation for the inversed relation between the buyback ratio and the age of a firm is that older firms pay-out more dividends and have a more stable dividend level because they have less growth opportunities (Denis & Osobov, 2008; Gordon, 1962; Walter, 1963). This means that they have less need to distribute excessive cash via share repurchases and therefore buyback less shares than younger firms. For the positive relationship between costs of debt and the buyback ratio a possible explanation can be found in the signalling theory. Almeida et al. (2016) found empirical evidence that managers are willing to make trade-offs to meet expectations on the earnings per share, because they fear the negative signal that not meeting those expectations will give.

Further, this research has several contributions to scientific knowledge. It reveals that for the Dutch listed firms in this sample, no evidence is found that financial constraints have a negative effect on dividend pay-out and share repurchases during the sample period. This in contradiction to earlier findings in the USA and to the hypotheses. A possible explanation for this is the strength of the signalling theory. For dividends, a possible explanation for these results is the phenomenon that managers are reluctant to cut or omit dividends because they are afraid that investors will see a negative dividend change as a negative signal for future prospects (Black, 1976; Simiyu, 2014). For repurchases, there is no such thing as maintaining the repurchase level, because they have a non-recurring nature and the information function is lower than for dividends (Brealey et al., 2014). However, the results can be explained by the earlier named trade-off that managers are willing to make to meet expectations and therefore give a positive signal. The findings on dividend pay-out and share repurchases support for the statements of Black (1976) and Almeida et al. (2016) that managers attach value to the signalling function of dividends and share repurchases. Because even a severe event like financial constraints does not give evidence for lower pay-outs and repurchases. Therefore, this research provides empirical results on the effects of financial constraints on dividend pay-out and share repurchases of Dutch listed firms in addition to the existing literature, and contributes by getting closer to the solution of the so-called dividend puzzle.

Besides the scientific implications of this research, there are practical implications for investors. The dividend puzzle is not only a complicated matter for researchers but also for investors. As long as perfect markets do not exist, dividends are relevant. Investors often face information asymmetry because managers have different information and not always share this with investors. Therefore, investors explore different ways to gain information (Black, 1976). The findings that financial constraints do not have a significant influence on dividend pay-out and share repurchases for Dutch listed firms in the sample and that managers attach value to the signalling function of repurchases and dividends can help to reduce this information asymmetry for current and future investors.

Additional to the theoretical and practical implications, this research has some limitations. The first limitation is the sample for the repurchases. For the second regression model the non-buybacks are included, because these observations also contribute to testing the second hypothesis. However, repurchases occur less frequently than dividend pay-outs, hence the sample for the variable *BBR* is very skewed. In the original sample, *BBR* has a skewness of 5.439, where this should be zero for a perfect normal distribution. After excluding the outliers this skewness was reduced to 3.224, however almost 70 observations had to be excluded from the sample.[5] By excluding the non-buybacks in the third regression this skewness should be addressed properly, however it strongly reduced the sample size from 289 to 98. In the multiple regression only 39 of these observations were appropriate for analysis. Despite the small sample size, the third model does however give significant results on the repurchases where in the second model those results are concealed by the non-buybacks. For future research, it would be convenient to use a larger sample for the share repurchases, i.e. include more sample years.

The second limitation is the measures for financial constraint. As explained in section 2.1 there is a variety of ways to measure financial constraints. Former studies in the US on the effect of financial constraints on dividend pay-out and repurchases, different measures are used interchangeably and without profound explanation. Even though financial constraint is a relative measure many forms studies make an arbitrary cut-off between constrained and unconstrained firms, those cut-offs differ per study and also often lack a profound explanation. This together with the criticism on the various measures, led to the decision to use univariate firm-level measures to measure financial constraints. However, this makes it more complicated to compare the former researches with this research.

6. CONCLUSION

The effects of financial constraints on dividends and share repurchases have been previously investigated for firms, mainly in the USA. Though useful in understanding these effects in the Netherlands they are not generalizable, e.g. because of different law systems and corporate governance mechanisms. That is why this paper aims to provide empirical evidence on the effects of financial constraints on dividend pay-out and share repurchases for Dutch publicly listed firms. From the hypotheses, it was expected that financial constraints have a negative effect on dividend pay-out and share repurchases.

To test the hypotheses, a sample of 500 Dutch firm years was constructed. The firms included in the sample were listed at least on year during the sample period 2010-2014, are located in the Netherlands and their data was required to be available on the financial database ORBIS. With this sample, the two hypotheses were tested in a multiple regression analysis.

The results show, conflicting with the hypotheses, for the Dutch listed firms in this sample, that financial constraints have no significant negative effect on dividend pay-out and share repurchases during the sample period. A possible explanation for this is the value that managers attach to the signalling function of dividends and share repurchases. The results give empirical evidence in addition to the existing literature on financial constraints, dividends and share repurchases.

[5] Like *BBR*, in the original sample the variables *DPR*, *BBR-0*, *Liq*, *R&D*, *CoD* and *Mat* show a high skewness varying from 3.103 to 13.366. However, after excluding the outliers from the sample, the skewness of almost all of these variables reduced to an acceptable level, varying from 0.017 to 1.066. Only for the sample of *R&D* the skewness still has a relative high value of 2.678. This is not surprising because more than half of the values in the sample have the value of zero.

The results also give practical implication for investors, because more understanding of the behaviour of Dutch firms in times of financial constraints can help reduce information asymmetry that current and future investors often face.

A recommendation for future research is to further investigate how far the reluctance of manager to cut or omit dividends goes and what price they are willing to pay to maintain their dividends. Another suggestion for further research is to investigate why there is a difference between the outcome of this research in the Netherlands and the outcome of other researches in the USA. This can give more insight about the strength of the signalling theory and can help to further reduce the information asymmetry, specifically in the Netherlands.

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8. REFERENCES

Almeida, H., Campello, M., & Weisbach , M. S. (2004). The Cash Flow Sensitivity of Cash. *The Journal of Finance, 59*(4), 1777-1804.

Almeida, H., Fos, V., & Kronlund, M. (2016). The Real Effects of Share Repurchases. *Journal of Financial Economics, 119*(1), 168-185.

Andriosopoulos, D., & Hoque, H. (2013). The Determinants of Share Repurchases in Europe. *International Review of Financial Analysis, 27*(1), 65-76.

Barclay, M. J., & Smith, C. W. (1996). On Financial Architechture: Leverage, Maturity, and Priority. *Journal of Applied Corporate Finance, 8*(4), 4-17.

Black, F. (1976). The Dividend Puzzle. *The Journal of Portfolio Management, 2*(2), 5-8.

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.

Brealey, R. A., Myers, S. C., & Allen, F. (2014). *Principles of Corporate Finance* (11th ed.). Berkshire: McGraw-Hill Education.

Brickley, J. A. (1983). Shareholders Wealth, Information Signaling and the Specially Designated Dividend. *Journal of Financial Economics, 12*(2), 187-209.

Campello, M., Graham, J. R., & Harvey, C. R. (2010). The Real Effects of Financial Constraints: Evidence From a Financial Crisis. *Journal of Financial Economics, 97*(3), 470-487.

Chave, S., & Roberts, M. R. (2008). How Does Financing Impact Investment? The Role of Debt Covenants. *The Journal of Finance, 63*(5), 2085-2121.

Chen, S., & Wang, Y. (2012). Financial Constraints and Share Repurchases. *Journal of Financial Economics, 105*(2), 311-331.

Cleary, S., Povel, P., & Raith, M. (2007). The U-shaped Investment Curve: Theory and Evidence. *Journal of Financial and Quantitive Analysis, 42*(1), 1-39.

Comment, R., & Jarrel, G. A. (1991). The Relative Signalling Power of Dutch-Auction and Fixed-Price Self-Tender Offers and Open-Market Share Repurchases. *The Journal of Finance, 46*(4), 1243-1271.

DeAngelo, H., & DeAngelo, L. (1990). Dividend Policy and Financial Distress: An Empricial Investigation of Troubled NYSE Firms. *The Journal of Finance, 45*(5), 1415-1431.

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.

Devreux, M., & Schiantarelli, F. (1990). *Investment, Financial Factors and Cash Flow: Evidence From UK Panel Data* (NBER Working Paper 3116 ed.). Cambridge: National Bureau of Economic Research.

Dittmar, A. K. (2000). Why Do Firms Repurchase Stock? *The Journal of Business, 73*(1), 331-355.

Easterbrook, F. H. (1984). Two Agency-Cost Explanations of Dividends. *The American Economic Review, 74*(4), 650-659.

Fazzari, S. M., Hubbard, R. G., Petersen, B. C., Blinder, A. S., & Poterba, J. M. (1988). Financing Constraints and Investment. *Brookings Papers on Economic Activity, 1988*(1), 141-195.

Gordon, M. J. (1962). The Savings, Investment and Valuation of a Corporation. *The Review of Economics and Statistics, 44*(1), 37-51.

Hadlock, C. J., & Pierce, J. R. (2010). New Evidence on Measuring Financial Constraints: Moving Beyond the KZ Index. *Review of Financial Studies, 23*(5), 1909-1940.

Hall, B. H. (2002). The Financing of Research and Development. *Oxford Review of Economics Policy, 18*(1), 35-51.

Huizingh, E. (2007). *Applied Satistics With SPSS.* London: SAGE Publications Ltd.

Kaplan, S. N., & Zingales, L. (1997). Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financial Constraints? *Quarterly Journal of Economics, 112*(1), 169-215.

Kaplan, S. N., & Zingales, L. (2000). *Investment-Cash Flow Sensitivities Are Not Valid Measures of Financing Constraints* (NBER Working Paper 7659 ed.). Cambridge: National Bureau of Economic Research.

Kim, J., & Park, J. L. (2015). How Do Financial Constraints and Distress Measures Compare. *Investment Management and Financial Innovation, 12*(2), 41- 50.

Kim, J., Schremper, R., & Varaiya, N. (2004). Open Market Repurchase Regulations: A Cross-Country Examination. *Corporate Finance Review, 9*(4), 29-38.

Lamont, O., Polk, C., & Saa-Requejo, J. (2001). Financial Constraints and Stock Returns. *Review of Financial Studies, 14*(2), 529-554.

Lie, E. (2000). Excess Funds and Agency Problems: An Empirical Study of Incremental Cash Disbursements. *Review of Financial Studies, 13*(1), 219-248.

Lie, E. (2005). Operating Performance Following Open Market Share Repurchase Announcements. *Journal of Accounting and Economics, 39*(3), 411-436.

Miles, J., & Shevlin, M. (2001). *Applying Regression & Correlation: A Guide for Students and Researcher.* London: SAGE Publications Ltd.

Miller, M. H., & Modigliani, F. (1961). Dividend Policy, Growth and the Valuation of Shares. *Journal of Business, 34*(4), 411-433.

Pal, R., & Ferrando, A. (2010). Financing Constraints and Firms' Cash Policy in the Euro Area. *The European Journal of Finance, 16*(2), 153-171.

Pathan, S., Faff, R., Méndez, C. F., & Masters, N. (2015). Financial Constraints and Dividend Policies. *Australian Journal of Management, 41*(3), 484-507.

Pettit, R. R. (1977). Taxes, Transactions Costs and the Clientele Effect of Dividends. *Journal of Financial Economics, 5*(3), 419-436.

Shefrin, H. M., & Statman, M. (1984). Explaining Investor Preference for Cash Dividends. *Journal of Financial economics, 13*(2), 253-282.

Simiyu, A. (2014). Signaling Theory of Dividends. *Journal of Behavioural Finance, 1*(1), 1-9.

Vermaelen, T. (1981). Common Stock Repurchases and Market Signalling. *Journal of Financial Economics, 9*(2), 139-183.

von Eije, H., & Megginson, W. L. (2008). Dividends and Share Repurchases in the European Union. *Journal of Financial Economics, 89*(2), 347-374.

Walter, J. E. (1963). Dividend Policy: Its Influence on the Value of the Enterprise. *The Journal of Finance, 18*(2), 280-291.

White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroscedasticity. *Econometrica, 48*(4), 817-838.

Whited, T. M. (1992). Debt, Liquidity Constraints, and Corporate Investment: Evidence From Panel Data. *The Journal of Finance, 47*(4), 1425-1460.

Whited, T., & Wu, G. (2006). Financial Constraints Risk. *Review of Financial Studies, 19*(2), 531-559.