# The Impact Of A Financial Crisis On The Dividend Payout Of Dutch Publicly Listed Firms

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As a result of the global financial crisis of 2007 many firms all around the world encountered serious liquidity problems, whereas others went bankrupt; a serious decrease in profitability was seen and investments dropped to zero. This paper examines whether these negative corollaries of the financial crisis had any consequence for the dividend payout of Dutch publicly listed firms. It does so by assessing the dividend payout ratios of 78 Dutch publicly listed firms during the precrisis, crisis, and post-crisis period (2006 – 2012). First of all, mean values of dividend payout ratio are compared for all periods as adopted by this study. Results indicate that although dividend payout ratio turns out to be higher during the crisis period opposed to the pre- and post-crisis period, the mean differences are not statistically significant. Secondly important variables and determinants of dividend payout with their corresponding relationships are identified by means of related literature after which they are tested by means of the data provided by these firms. All relationships between dividend payout ratio and the independent variables profitability, firm size, growth opportunities, earned equity and liquidity show to be statistically insignificant in the results of both the correlation and regression analysis. However, the self-constructed dummy variable crisis did show to be close significant during the regression analysis, so that this paper found a substantial yet not statistical significant positive impact of the financial crisis on the dividend payout ratio of Dutch publicly listed firms.

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#### Keywords

Dividend payout, Dividends, Financial crisis, Dividend payout ratio, Dividend policy, Credit crunch, Dutch publicly listed firms, Liquidity

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#### **1. INTRODUCTION**

The subprime mortgage crisis developed in the United States and became a full financial crisis during 2007 affecting financial sectors over the entire world and particularly Europe (Moshirian, 2010). However, not only financial markets and institutions were affected by the crisis, also goods markets and consumers all over the world were hit hard, therefore it can thus be said that the crisis generated a global effect (Akbar, Rehman & Ormrod, 2013). Many firms started to have serious liquidity problems, whereas other firms went bankrupt; a serious decrease in profitability was seen and investments dropped to zero (Buca & Vermeulen, 2012; Taylor, 2008).

The focus of this paper is on the effect of a financial crisis on the dividend payout of Dutch publicly listed firms: Do Dutch publicly listed firms change their dividend payout during and after a crisis? And can this change solely be ascribed to a crisis or are there other factors responsible as well? In order to get a better understanding on this topic, the financial crisis of 2007 and its causes and implications will be described in the following section 1.1. Furthermore, background information regarding dividends will be provided in section 1.2.

#### 1.1 The global financial crisis of 2007

As the name of the subprime mortgage crisis implies the most important cause of the crisis has to do with subprime mortgages. A mortgage-backed security is a share on the monthly payments of mortgages. Investors, banks and investment companies all around the world were willing to invest in these 'very safe' shares of monthly income.

Up to 2006, the housing market in the US was flourishing. It was easy to get a mortgage so every individual in the US wanted to buy a house. This in turn leaded to the housing bubble (Barth, 2009). Prices kept rising, thereby hiding the consequences from all the 'bad' loans provided to unqualified individuals. Since the value of houses kept rising, even people unable to pay their monthly mortgage payments, could simply take another loan against the surplus value added to their houses. Banks saw the houses as great collateral, so they provided the loans. Amongst all others, income did not rise. So eventually something had to go wrong (Greenspan, 2007).

This was the start of the subprime mortgage crisis of 2007 in the United States. House owners were simply not able to pay their monthly mortgages. This made the housing bubble burst. The house prices dropped and people defaulted on their monthly payments. According to Demyanyk and van Hemert (2011), more and more foreclosures took place, which meant huge losses for banks, investment companies and investors all around the world (Barth, 2009). Not only the value of the securities dropped massively, whole houses were written down, thereby directly diminishing the books of banks and investment companies.

The United States was suffering as a consequence of the subprime mortgage crisis in 2007. But as already mentioned before, the consequences of the crisis reached much further. Particularly Europe was affected because of import, export and interrelation between banks and investment firms around the globe (Moshirian, 2010).

As this paper focuses on Dutch Publicly listed firms, the implications of the financial crisis of 2007 for the Netherlands are mentioned here. Compared to other Western countries, the Netherlands did quite well and had a reasonably stable economy when the financial crisis hit the ground. The national debt did not rise out of proportions and was quite low seen the circumstances. Furthermore, both the inflation rate and the unemployment rate were fairly low. However, the financial

crisis did also hit the Netherlands (see Figure 1 in Appendix A). Which means that the financial crisis of 2007 also had an impact on Dutch companies. For the purpose of this paper, this can be seen as positive.

# 1.2 Dividends

For the purpose of this study it is important to explain what dividends are precisely. Dividends are paid out to shareholders as a form of return on investment (ROE) or a reward for investing in a company. Up till now a lot of research has been done on dividends and the policies as used by firms, with varying underlying goals and corresponding outcomes. Moreover, all those studies mainly examined why firms actually pay dividends and what the main determinants behind the payment of dividends are. Resulting in several studies agreeing on the validity of certain determinants behind the payment of dividends and the formulation of multiple 'competing' theories. However a definite answer to the question why firms actually pay dividends still has not been provided by literature.

Although a definite answer to the 'why' question of dividend payout is lacking in literature, several potential explanations have been provided. Some studies argue for example that dividends are paid out as a result of the tax-regime or because of transactions costs. Arguments for both tax-regime and transaction costs play a vital role in the clientele/ catering theory. This theory is constructed on the basis that there are different groups of investors with different needs. In some countries dividends are taxed at a lower rate than the gains on stock ownership or vice versa. Making a payment in dividends more desirable for investors than an increase in share value or vice versa. Moreover both firms and investors (equity holders) want to minimize their transaction costs as much as they possibly can. If paying dividends leads to the minimization of transaction costs this could thus be an explanatory factor of the dividend payout of a firm.

Another potential explanation often encountered in literature is the one of agency theory. An agency problem may arise if there is asymmetric information between managers (agents) and shareholders (principals). Principals' desire is that the agents will run the firm in their interest. However this is not always the case with agency costs as a result (Jensen, 1986). Managers may for example invest free cash flow on new projects that have no value to the firm (principals) or on other things that are solely in their own interest. To avoid this from happening the principal could set up extra monitoring, which in turn will cost money to the firm. But instead of spending money on monitoring or potentially lose money because of excessive spending by managers, the free cash flows can also be paid out as dividends. Thereby avoiding both problems.

The agency theory also plays a big part in the signaling theory. Just like agency theory, the signaling theory is based on asymmetric information. According to the signaling theory, firms will pay dividends to provide the market with signals of future earnings. Therefore dividend can be seen as a communicative mechanism to provide shareholders with additional (inside) information.

The final theory to which is often referred to in existing literature about dividends, is the life-cycle theory of dividends. As with the previous theories that are mentioned, this theory also holds potential arguments, which could in turn explain why firms pay dividends. The underlying assumption of the lifecycle theory is that the dividend payout of firms is dependent on the stage of the life cycle in which the firm is operating. As a firm evolves during his life, firm characteristics will change over time. These characteristics are proven in several studies on the life-cycle theory of dividends to be determinants for the dividend payout. For example young firms have a lot of growth opportunities in combination with limited resources. Therefore utilizing growth opportunities is much more important to younger companies than paying out dividends. Mature firms on the other hand are better candidates to pay dividends because they have higher profitability and fewer attractive investment opportunities (DeAngelo, DeAngelo & Stulz, 2006).

Where previous studies are mainly focused on the determinants of- or theories about dividends under stable/normal economic conditions, the decisions a firm makes regarding dividend payout during and after a financial crisis are relatively unexamined. This study hopes to fill this gap in existing literature by adding a better understanding on how firms behave in times of a financial crisis and after a financial crisis, regarding their dividend payout. Furthermore this paper expands existing literature on the effects of a financial crisis on dividend payout by focusing only on Dutch publicly listed firms. It is expected by this study that a crisis has an impact on the dividend payout of firms. The financial crisis did hit the Netherlands (see Figure 1 in Appendix A). Which means that the financial crisis of 2007 also had an impact on Dutch companies. Therefore it is expected that companies as well as individuals have less money to spend during a crisis than prior to a crisis. Thus with expenditure being lower, so is profitability for companies and so is excess cash. Therefore the expectation is that due to this decrease in profitability for companies, the allocation of their cash changes. This could thus in turn mean that dividends are affected since money is allocated elsewhere. In order to test this expectation, the following research question is proposed: "To what extent has a financial crisis impact on the dividend payout of Dutch publicly listed firms?'

The academic relevance of this paper is thus that a new, not yet existing perspective in literature on dividend payout during and after a crisis for Dutch publicly listed firms will be provided. Furthermore this study will test whether the impact on dividend payout ratio is a result of a financial crisis or that other factors play a role as well. Thereby contributing with more insights on the behavior of firms during and after a crisis towards shareholders. The practical relevance of this paper is therefore that it could thus provide (potential) investors/shareholders with information on how to handle when a financial crisis occurs.

The sample used in this paper contains 78 Dutch publicly listed firms. In order to test both hypotheses and in order to ultimately answer the central research question, data from prior to the crisis, during the crisis and after the crisis for all 78 Dutch publicly listed firms had to be collected. The total period as assessed by this paper will cover the years 2006-2012. 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 company information. Since this database provides all data needed about Dutch publicly listed firms, there is no need to collect secondary data.

The rest of the paper is structured as follows: Section 2 comprises the theoretical framework of this study. A review of existing literature regarding dividends will be provided. Thereby highlighting all relevant determinants of- and theories about dividend payout for this study. Furthermore this section will analyze existing literature on the impact of a financial crisis on dividend payout. At the end of this section, two hypotheses will be constructed as a result of the outcomes of the literature review. Section 3 will describe the methodology that is used in this study. Also an elaboration of the variables will be provided in this section. The data will be presented and analyzed in section 4. Followed by the results of the tests in section 5. Whereas section 6 concludes the paper.

## 2. THEORETICAL FRAMEWORK

In this section the theoretical framework for this study will be constructed. First a review will be provided that focuses on the importance of dividend policy. Secondly several studies, which made their contribution to the literature in explaining the determinants of dividend payout, will be described. Thirdly and lastly existing studies combining both dividend payout and a financial crisis are the focus of attention. Afterwards multiple hypotheses will be formulated based on the knowledge obtained from the literature review.

### 2.1 Literature review on dividends

#### 2.1.1 The importance of dividend policy

Why do some firms pay dividends while others do not? This question keeps many financial economists, investors and managers puzzled since the publication of the so-called irrelevance theorem study by Miller and Modigliani (1961). In their study, Miller & Modigliani were the first to study the effects of a firms' dividend policy on the current value of its shares. In order to do so they made an important assumption, namely that there are no market imperfections. This assumption can be deconstructed into three components: a perfect capital market, rational behavior and perfect certainty (the absence of taxes and other frictions). Furthermore they assumed that free cash flow would be fully distributed, meaning no retention of excess cash. The main conclusion formulated by Miller & Modigliani was that it does not matter what dividend payout policy a firm uses. The current price of the shares is not affected by dividend policy nor is the total return to the firms' shareholders. To found this conclusion, Miller & Modigliani show that when a firm pays out dividends, the terminal value of its shares decreases with exactly the amount paid out in dividends. Therefore investors are indifferent between a higher share value and receiving dividends.

Although the pioneer study of Miller & Modigliani is often used as a starting point in later research on dividends, not everyone concords. Several studies argue the relevance of the irrelevance theorem. Starting with a study conducted by Walter (1963). His study comprised the same focus as the study of Miller & Modigliani, namely the effects of paying out dividends on the value of a firms' its shares. Shareholders share in the operating cash flows of each period to the degree that cash dividends are declared and paid, and in future cash flows insofar as they are reflected in the market price of the stock. The market price of the shares along with their anticipated dividend streams and terminal value determines the decision of the investor to buy, hold or sell the shares. Walter (1963) concludes by saying that we do live in a world with imperfections and those imperfections lead to differences in firm value, thereby relaxing the assumptions of a perfect world, as used in the irrelevance theorem of Miller & Modigliani.

Another study to disprove the irrelevance theorem of Miller & Modigliani is the one of DeAngelo and DeAngelo (2006). According to them irrelevance fails when not 100% of free cash flow is paid out to shareholders, allowing retention of free cash flow (recall the retention of excess cash as explained above). When excess cash is retained, meaning not fully invested into new projects or paid out to shareholders, the decision a manager makes regarding the allocation of the excess cash affects stockholder wealth, showing that payout policy is not irrelevant and investment policy is not the sole determinant of value. DeAngelo & DeAngelo conclude their study by stating that dividend payout policy thus matters. A statement also shared by Brav, Harvey and Michaely (2005).

#### 2.1.2 Dividend payout and its determinants

Lintner (1956) found that firms with different characteristics used dissimilar dividend policies for various situations. Furthermore the phenomena that managers are reluctant to cut or increase dividends, meaning that dividends are 'sticky' was highlighted by this study. According to Lintner managers set a target ratio regarding their dividend payout prior to setting other policies. In this study the target ratio (payout ratio) was found to be 50% of the total earnings on average. Another finding of this study was that lagged earnings are the key determinant for dividends. With lagged earnings is meant the lag between accounting quarter end and the time in which the firms are able to release their earnings. Thereby implying that dividend movements are less volatile as earnings movements. Since the dividend payout ratio is set, managers do not easily deviate from it. Therefore earnings need to substantial increase (decrease) before dividends will increase (decrease). The final observation made was that the maturity of a firm, is a characteristic of dividend paying firms. Mature firms smooth dividends each year and set target long-term payout ratios.

The study of Black (1976) tried to answer the question: "why do corporations pay dividends?" in order to solve the dividend puzzle. In his study, Black uses the irrelevance theorem of Miller & Modigliani as a starting point for his research. Although he finds a lot of factors influencing dividend policy decisions, like taxes, transaction costs, investors' demand for dividends, capital structure and the information dividends communicate to shareholders, a definite answer to the question why firms pay dividends fails to appear. He therefore concludes that the dividend puzzle remains unsolved by answering the question why firms pay dividends with: "we don't know".

In his turn Redding (1997) found in his study that both firm size and liquidity are determinants for the payout of dividends by firms.

The next study to be discussed is the study of Brav et al. (2005). They show that liquidity is an important determinant of dividend policy. Reduced liquidity can lead to a decrease in stock prices according to their study. Therefore liquidity problems need to be solved. They show that the easiest way of doing so is to reduce share repurchases. Hence they showed that share repurchases are far more flexible than adjustments of the payouts of dividend. They found this by stating that one of Lintner's key findings still holds: Dividend payout is conservative and firms are reluctant to cut dividends. However, if reducing shares repurchases is not enough to ensure a minimum level of liquidity, adjustment of the amount of dividend payout can be used as a last resort.

DeAngelo, DeAngelo and Stulz (2006) showed in their research that the fraction of publicly traded industrial firms that pays dividends is high when retained earnings are a large portion of total equity (and of total assets) and falls to near zero when most equity is contributed rather than earned. This finding is consistent with the life-cycle theory of dividends, because when retained earnings are a large portion of total equity (RE/TE) and a large portion of total assets (RE/TA) it means that a firm is in the maturity stage since it's cumulative profits are high enough to make the firm largely self-financing. Whereas if RE/TE and RE/TA would be low, it would mean that a firm is still in the capital infusion stage.

An important study proving multiple determinants and theories on dividends was the research done by Denis and Osobov (2008). They prove the validity of determinants for the payout of dividends like firm size, growth opportunities and profitability. Additionally evidence is provided for signaling and clientele explanations. Subsequently the life-cycle theory of dividends was proven by this study. Thereby confirming several key assumptions of the life-cycle theory, namely that more mature firms have a higher propensity to pay dividends, due to increasing costs of retention and less growth opportunities. Moreover, dividend paying firms, are more likely to keep paying dividends, while non-dividend paying firms or not likely to initiate dividend payments.

Whereas the previous studies all focused on industrial companies in the United States, von Eije and Megginson (2008) dedicated their study to the dividend policy and repurchase of shares in the European Union. They show that profitability is a determinant for the payout of dividends for firms in the European Union. Where high profitability results in a higher dividend payout. These findings are in line with the findings of Denis and Osobov (2008). However, the remainder of the findings in the paper of Denis and Osobov (2008), which were significant for the United States showed to be insignificant for the European Union. Hence no significant correlation between the earned/contributed capital mix and the likelihood to pay dividends was found. Instead, the age of a firm (life-cycle theory) is seen by this study to be a main determinant of dividend payout.

#### 2.1.3 Dividend payout in times of a crisis

Floyd, Li, and Skinner (2014) found in their study that aggregate dividends grow up to hitting a peak in 2007. From this peak in 2007, dividends decline slightly until 2009 (by 5.4% overall), showing that as the financial crisis takes hold, industrials reduce dividends modestly, consistent with the reluctance to cut dividends and the increasing conservatism of dividend policy (Lintner, 1956; Brav et al, 2005). In the years to follow the aggregate dividends increased to numbers well above the 2007 peak. Therefore for industrials, dividends were not greatly affected by the crisis. The final finding has to do with the payout ratio of dividends. Eric Floyd, Nan Li, and Douglas J. Skinner found that for median payout ratios for both industrials that only pay dividends and industrials that repurchase shares and pay dividends increased over the years. Even in and after the period of the crisis the ratios kept increasing modestly. This is consistent with the reluctance to cut dividends (Lintner, 1956; Brav et al, 2005), payout ratios for both sets of firms increase after 2006 as dividends are held constant (or increased) in the face of earnings declines (due to the crisis).

#### 2.2 Hypotheses

Based on the information retrieved from existing literature used to construct the theoretical framework, this study will investigate the following hypotheses and sub-hypotheses, which will be tested by the outcomes of the data analysis. The first hypothesis and its accompanying sub-hypotheses are as follows:

H1: In times of a crisis firms will adjust their dividend payout ratio (DPR).

H1a: During the crisis the dividend payout ratio is higher than prior to the crisis (pre-crisis).

H1b: During the crisis the dividend payout ratio is higher than after the crisis (post-crisis).

H1c: After the crisis (post-crisis) the dividend payout ratio is higher than prior to the crisis (pre-crisis).

In order to see whether the change (H1) is due to the crisis a second hypothesis is constructed:

# H2: The crisis has a positive impact on dividend payout ratio (DPR).

The hypotheses and sub-hypotheses are directly derived from the empirical evidence as presented by Floyd et al. (2014). The crisis is expected to have a positive influence on the dividend payout ratio (DPR). Floyd et al. (2014) found a slight decrease in dividend payout in times of a crisis however not significant. Thereby confirming that during the crisis managers are reluctant to increase or decrease dividend payout (deviate from the dividend payout), just like Lintner (1956) and Brav et al. (2005). Since the dividend payout only decreased modestly, it is therefore assumed by this study that dividend payouts during the crisis are equal or slightly lower than during the pre-crisis period. Moreover another argument can be given for the slight decrease in dividend payout. Profitability is proven to be a determinant of paying out dividends (Denis & Osobov, 2008; von Eije & Megginson, 2008). In times of a crisis the Gross Domestic Product (GDP) shrinks as is explained in section 1.3 in the introduction part of this paper (see Figure 2 in Appendix A). As the GDP decreases so do earnings resulting in a decrease in profitability. As profitability has a positive correlation with dividend payout the decrease in profitability will thus mean a decrease in the dividend payout. Furthermore, earnings are far lower during the crisis, but dividend payouts are as discussed above almost equal to the pre-crisis period, because managers are reluctant to decrease the dividend payouts (Lintner, 1956; Brav et al., 2005; Floyd et al., 2014). Therefore the payout ratio (total dividends / total net earnings) is expected to be far higher when earnings decrease and dividends remain constant. This underlines the first sub-hypothesis, namely that during the crisis the dividend payout ratio is higher than in the pre-crisis period.

Furthermore, with earnings increasing significant in the postcrisis period and dividends increasing only modestly (Floyd et al., 2014) the dividend payout ratio decreases. Therefore the second sub-hypothesis is as follows: after the crisis (post-crisis period) the dividend payout ratio is lower than during the crisis. Finally the third sub-hypothesis is based on the following argumentation: As can be seen in Figure 2 in the Appendix (part A), GDP for the Netherlands increased in the post-crisis period, however it did not reach the same height as in the pre-crisis period. Therefore it is to be expected that although the dividend payout ratio is already smaller in the post-crisis period than it was during the crisis (sub-hypothesis H1b), the dividend payout ratio for the post-crisis period is still higher than the ratio before the crisis (pre-crisis period).

### **3. METHODOLOGY**

This section will describe the methodology that is used in this study. First the model will be presented and explained, followed by the definitions of the variables, which have been used to construct the model.

#### 3.1 Model

In order to test the second hypothesis a model similar to the model of Denis and Osobov (2008) on dividend payments is adopted by this study because proven determinants of dividend payout (like profitability, growth opportunities, firm size and earned equity) are already included. These proven determinants will act as independent variables. Furthermore literature shows that liquidity plays an important role regarding the dividend payout of firms. Therefore a measure of liquidity is added to the model of Denis and Osobov (2008) as an independent variable. Moreover adding an extra independent variable could improve the validity of the model in explaining the dependent variable. Lastly a dummy variable for crisis is added to the model to differentiate between periods.

The model used by this study consists of the following regression equation:

Dividend Payout Ratio 
$$(DPR)_t = \beta_0 + \beta_1(P)_{t-1} + \beta_2(GO)_{t-1} + \beta_3(FS)_{t-1} + \beta_4(EE)_{t-1} + \beta_5(L)_{t-1} + \beta_6(CRI)_t + \varepsilon_t$$

With:

DPR = Dividend Payout Ratio

- P = Profitability
- GO = Growth Opportunities
- FS = Firm Size
- EE = Earned Equity
- L = Liquidity
- CRI = Dummy Variable Crisis
- $\epsilon = Error Term.$

The definitions and measurements of all the variables as presented above will be provided in the next section (3.2). Moreover arguments will be given why this paper chose to use these variables. First the dependent variable will be explained followed by the independent variables.

#### 3.2 Variables

This section starts by defining the dependent variable dividend payout ratio (DPR). This is the most important variable of this study since the goal of this study is to test whether the dividend payout is affected by a crisis and whether the determinants for the payout of dividends are affected by a crisis. Furthermore, this variable is called the dependent variable because it is dependent on the independent variables, which are written down after the equals sign. Afterwards the independent variables will be defined, to complete the model.

#### 3.2.1 Dependent variable

The dependent variable as adopted by the model used in this paper is dividend payout ratio (DPR); dividend payout ratio (DPR) is a so-called proxy for the term 'dividend payout'. Since the ultimate goal of this study is to test the impact of a crisis on the dividend payout of Dutch publicly listed firms, this proxy will be used.

#### 3.2.1.1 Dividend payout ratio (DPR)

The dividend payout ratio divides total dividends paid out to shareholders by total net earnings (net profit) of a firm. This results in the following formula for dividend payout ratio (DPR):

Dividend Payout Ratio (DPR) = 
$$\frac{\text{Total Cash Dividends}}{\text{Total Net Earnings}}$$

Where total dividends thus acts as the nominator and total earnings as the denominator.

#### 3.2.2 Independent control variables

The model, which is used by this paper, consists of five independent variables. The first four independent variables; profitability (P), growth opportunities (GO), firm size (FS) and earned equity (EE) are derived from the model of Denis and Osobov (2008). Moreover this study uses the same definition and composition of these variables as Denis and Osobov (2008) did in their study. The definition and composition of the final independent variable; liquidity will be explained in this section as well.

# 3.2.2.1 Profitability (P)

Profitability (P) is measured in this study as total earnings to the book value of total assets. Net. Income is used to obtain data for the earnings part of this equation. This definition is as said above directly derived from the study of Denis and Osobov (2008).

Profitability = 
$$\frac{\text{Earnings (Et)}}{\text{Total Assets (At)}}$$

The expected relationship between dividend payout ratio (DPR) and profitability (P) is positive. This expectation is based on the literature as discussed in the literature review part of this paper. Where multiple studies are highlighted which provide evidence for the positive relationship between dividend payout ratio (DPR) and profitability (P) (Denis & Osobov, 2008; von Eije, & Megginson, 2008).

#### 3.2.2.2 Growth opportunities (GO)

Growth opportunities (GO) are defined as the market value divided by the book value of total assets. This translates into the following equation:

Growth Opportunities = 
$$\frac{\text{Market Value (Vt)}}{\text{Total Assets (At)}}$$

The relationship between dividend payout ratio (DPR) and growth opportunities (GO) is found by many studies to be a negative one (DeAngelo et al., 2006; Denis & Osobov, 2008). Therefore it is expected by this study that this variable behaves in the same way for Dutch publicly listed firms and thus forms a negative relationship with dividend payout ratio (DPR).

#### 3.2.2.3 Firm size (FS)

Whereas the previous variables are defined by almost all studies on dividends in the manner in which they are presented above, the variable firm size (FS) can be defined in multiple ways. Measurements, which can be used, are sales, number of employees and total assets. Since the model of this study is derived from the model of Denis and Osobov (2008) and since they used the natural log of total assets in millions, so will this study.

Firm size = Natural logarithm of Total Assets (At)  $\rightarrow$  ln(A)

The relationship between dividend payout ratio (DPR) and firm size (FS) is expected to be a positive one. This is based on findings of previous studies (Redding, 1997; DeAngelo et al., 2006; Denis & Osobov, 2008).

#### 3.2.2.4 Earned equity (EE)

The final variable that is derived from the model of Denis and Osobov (2008) is earned equity (EE). The equation of this variable of Denis and Osobov (2008) divides total retained earnings by total book value of equity, as represented below:

Earned Equity = 
$$\frac{\text{Retained Earnings (REt)}}{\text{Book Equity (BEt)}}$$

Moreover a positive relationship between dividend payout ratio (DPR) and earned equity (EE) is expected (Denis & Osobov, 2008).

#### 3.2.2.5 Liquidity (L)

The independent variable to be added to the model of Denis and Osobov (2008) in order to improve the validity of the model in explaining the dependent variable is liquidity. Hence liquidity shows to be an important determinant for dividend payout in existing literature. Just as with the variable firm size (FS), multiple formulas can be used to explain the liquidity aspect. Examples are the current ratio, quick ratio and operating cash flow ratio. This study will use the current ratio, as the quick ratio and the operating cash flow ratio contain of several elements, which are beyond the scope of this study. Therefore the easiest option is chosen, namely the current ratio. This proxy is calculated by dividing total current assets by total current liabilities.

$$Liquidity = \frac{Total Current Assets (TCAt)}{Total Current Liabilities (TCLt)}$$

As indicated by Redding (1997), Brav et al. (2005) and DeAngelo et al. (2006), liquidity (L) is expected to form a positive relationship with dividend payout ratio (DPR). Since a

higher liquidity means more excess money which firms allocate to the payment of dividends.

#### 3.2.3 Dummy variable crisis (CRI)

The pre-crisis period comprises data for 2006, 2007 and 2008. For this period the value of the dummy variable crisis will be 0. Furthermore, the year 2009 is defined as the period of the crisis in this paper. Therefore the crisis period will have a dummy value of 1. The post-crisis period comprises data for 2010, 2011 and 2012. For this period the value of the dummy variable crisis will be 0 as well. The motivation behind the allocation of the years to the three periods as mentioned above is as follows: in Figure 2 in the Appendix (part A) a table is presented, containing numbers for the trade value and numbers for the value of the GDP of the Netherlands. The year 2009 shows a severe value decrease in GDP, total imports and total exports. Due to this overall drop in 2009, the crisis period is ascribed to this year. Furthermore both the pre-crisis and post-crisis period are apportioned equally with three years, so that both periods have a consistent time distribution. The dummy variable crisis (CRI) is expected to form a positive relationship with dividend payout ratio (DPR).

#### 4. DATA

#### 4.1 Data selection

As the research question implies, this study will only focus on Dutch publicly listed firms. The necessary data will be obtained from the database ORBIS as mentioned in the introduction part of this paper. In order to arrive at the desired sample, all utilities with standard industrial classification (SIC) codes 4900-4949 and all financial firms with SIC codes 6000-6999 will be excluded from the data, because of the extensive regulatory oversight present in those industries (Ferris, Sen & Yui, 2006). Thereby following the example set out by multiple other studies on the same topic (Denis & Osobov, 2008; von Eije & Megginson, 2008).

Moreover the country will be set to the Netherlands and the option listed/unlisted firms will be set to listed firms. Furthermore the years taken into account are 2006, 2007, 2008, 2009, 2010, 2011 and 2012. The currency used in this paper is the Euro. As a result the final sample consists of 78 Dutch publicly listed firms, which are non-financial and do not operate in the utility industry and which have paid cash dividends in the defined period for this study and which have non-missing values for the variables described in section 3.2 in at least one of the years as defined as the period of this study (2006-2012). Furthermore some firms have missing values for some of the variables for the years as defined as the period of this study. However the data has been cleaned, meaning that firms who showed missing values due to for example bankruptcies are not eliminated from the dataset, but are taken into account. Other missing values can be the cause of new entrants (IPO's) or due to missing data in the dataset, which is non-systematic (meaning not structurally missing). The resulting population for this study to analyze the data and to arrive at the results is therefore 78.

#### 4.2 Data analysis

To conduct a thorough data analysis, several statistical tests will be performed. First of all, descriptive statistics are used in order to present a brief overview of the total data set. Hence this will give an idea on how dividend payout evolved over the period that is used by this paper (2006-2012). In this section an overview for all three periods; pre-crisis, crisis and post-crisis will be presented, as well as an overview of the total period. To distinguish between the different periods the data will be averaged for the three periods. Meaning that for the years 2006, 2007 and 2008 (representing pre-crisis) the values will be averaged by taking the mean, resulting in average values for those three years. The number of observations is therefore not equal to the number of firms times three (three years), but it is the similar to the number of firms times one (averaged for just one period, namely pre-crisis). Exactly the same process is used to average the values for the post-crisis period (2010, 2011 and 2012). The crisis period only contains values for one year, namely 2009, so in describing the data for this period there is no need to combine multiple years and average the values at the mean. In order to present an overview of the data for the total period, values for the years 2006-2012 will be averaged at the mean as well. Therefore the number of observations will always be equal or less as the total population, since this will thus also only describe one period, namely the total period that is used by this study.

To examine hypothesis one (H1) and its sub-hypotheses H1a-H1c, a paired sample t-test will be conducted comparing the means of two groups at the time. As H1a indicates that during the crisis the dividend payout ratio is higher than prior to the crisis (pre-crisis). It thus compares the mean dividend payout ratio of the group crisis with the mean dividend payout ratio of the group pre-crisis. H1b and H1c also differentiate between two groups, therefore a paired sample t-test will be conducted to compare the two means and to see whether there is a significant difference in dividend payout ratio between all the groups. The results will be shown in a table, according to the three subhypotheses. So that the sub-hypotheses can easily be rejected or failed to be rejected depending on the outcomes of the t-tests and their significance.

Furthermore a correlation analyses will be performed to assess the relationship between dividend payout ratio and each of the independent variables (the determinants for dividend payout) for the three periods (pre-crisis, crisis and post-crisis) as mentioned above and the total overall period (2006-2012). A linear regression analysis will be conducted in order to test the second hypothesis. A dummy variable for crisis will be added to the model and in order to answer the second hypothesis, the coefficient of the dummy variable and its significance will be taken into account. The linear regression analysis will use observations for all periods (pre-crisis, crisis and post-crisis) and will appoint the dummy variable (CRI) with a value 1 for observations of the crisis period. In this section a multiple regression (R-square) test will also be conducted in order to measure the validity of the whole model. This is to see for how much percent the independent variables account for the total variation of dividend payout ratio. In conducting the statistical tests, this paper uses a finding highlighted by Lintner (1956), namely that lagged earnings are the key determinant for dividends and that thus dividends are based on the earnings of the previous accounting period, therefore this paper uses a lag in its analysis, which means that all independent variables (profitability (P), growth opportunities (GO), firm size (FS), earned equity (EE) and liquidity (L) of year T-1 will be used to define the dependent variable (dividend payout ratio (DPR)) in year T.

#### 5. RESULTS

The results of the various analyses used by this paper will be presented in this section. The first part of this section is allocated to the descriptive statistics in absolute form. In part two of this section the results of the paired samples t-test will be discussed. Followed by an analysis per variable where results from both the correlation and the regression analysis are taken into account. Part four will form the final part of this section. This part will highlight the outcomes of the regression analysis as well as the validity of the overall model as adopted by this study.

#### 5.1 Descriptive statistics

In order to give a better overview of how the data is distributed, the descriptive statistics part will differentiate between precrisis years (2006-2008), the crisis year (2009), post-crisis years (2010-2012) and the overall period (2006-2012). In Table 1 in the Appendix (part B), the descriptive statistics for all periods is summarized and presented.

The first thing worth mentioning is that for the variable firm size it seems that there is little to no change to be present. The minimum, maximum, mean, median and standard deviation are rather equal for all the periods. The same thing can be said for the variable liquidity, although with the exception that the maximum values for liquidity seem to decrease as time evolves. With a maximum value of 9.04 during the pre-crisis, decreasing to 7.29 during the crisis and even further to 3.38 for the post-crisis period.

The variable earned equity is far from constant over time. In times of a crisis this variable shows to have the highest maximum value as well as the highest value for the mean, median and standard deviation. With values far higher compared to the pre-crisis, post-crisis and total period This could mean that firms tend to retain more earnings in times of a crisis instead of spending all their cash.

As for growth opportunities, there is a difference between the values of the crisis year and the values of the pre-crisis years, post-crisis years and the total period. The minimum, maximum, mean, median and standard deviation values for the variable growth opportunities are much lower during the crisis. The mean value of growth opportunities is almost two times lower during the crisis compared to the pre-crisis period. The post-crisis period is higher than the crisis period, to point to the effect of the crisis on growth opportunities. It thus seems that firms have less growth opportunities in times of a crisis.

Furthermore the minimum value for profitability appears to be far lower during the crisis year. Although the maximum value seems to be quite high compared to the post-crisis years and overall period, the mean value for profitability during the crisis is the lowest compared to the other periods. The median value for profitability also shows to be smaller in times of a crisis than during the pre-crisis period. Moreover the standard deviation value for profitability is almost two times higher during the crisis period compared to the pre-crisis, post-crisis and overall period. Therefore it seems that profitability is affected by the crisis (Buca & Vermeulen, 2012; Taylor, 2008).

Finally dividend payout ratio shows to be much larger during the crisis period opposed to the other periods. The maximum value for dividend payout ratio during the crisis is 11.11 compared to respectively a value of 2.42 for the post-crisis period and 3.56 for both the pre-crisis period and the total period. Furthermore the mean value for dividend pavout ratio seems to be larger as well during the crisis compared to the other periods. Where the mean value of dividend payout ratio during the crisis is three times as high as during the post-crisis period and two times as high as during the pre-crisis and for the total period. Recall that Floyd et al. (2014) found that as earnings are far lower during the crisis and total cash dividends remain stable, because managers are reluctant to decrease the dividend payouts (Lintner, 1956; Brav et al., 2005; Floyd et al., 2014), the dividend payout ratio increases. The results of the descriptive statistics based on the maximum and mean values of the dividend payout ratio thus seem to be in line because they

indicate an increase in dividend payout ratio in times of a crisis as well.

However it should be said that the median value is not higher in times of a crisis as opposed to the other periods. Furthermore the median value for dividend payout ratio is almost two times lower than the mean value in times of a crisis. An explanation for this is that in times of a crisis there a more outliers in the values for dividend payout ratio as a result of bigger fluctuations in earnings, with cash dividends being equal. Hence the mean (average) value is thus higher, but the median (middle value of the data) is not. However for the other periods the mean and median value for dividend payout ratio seem to be somewhat equal. Furthermore the mean and median values for all other variables as adopted by this paper seem to be rather equal as well for all the periods as assessed by this paper. Therefore this paper will continue to use the mean as a measurement for the average, since there is no need to adopt the median.

#### 5.2 Mean comparisons

In order to test hypothesis one (H1) and its sub-hypotheses (H1a-H1c) this section will describe the results of the paired samples t-test (see Appendix C). The descriptive statistics part showed that the values for dividend payout ratio indeed varied for the different periods as defined by this study. However no conclusions can yet be made based on the descriptive analysis part. In this part, however, the mean values for dividend payout ratio of all periods (pre-crisis, crisis and post-crisis) will be compared and the results of the differences will take into account the statistical significance. Therefore conclusions regarding the differences in dividend payout ratios for all periods can be made based on the results from this part, to ultimately reject or fail to reject H1a-H1c.

Table 2 in the Appendix (part C) shows the paired sample statistics. Here the mean values for the pairs based on the number of firms (N) taken into account are provided. Where pair 1 corresponds with the periods of sub-hypothesis H1a, pair 2 with sub-hypothesis H1b and pair 3 with sub-hypothesis H1c. Furthermore the mean differences for the three pairs are provided. Pair 1 has a mean difference of 0.286, which is positive. Thereby indicating that dividend payout ratio is indeed higher during the crisis period as apposed to the pre-crisis period, a finding in line with the study of Floyd et al. (2014). Furthermore the mean difference for pair 2 is 0.301, which is again positive and thus indicates that dividend payout ratio is indeed higher during the crisis period as apposed to the postcrisis period. Finally the third pair shows to have a mean difference of -0.003, which is a really small difference, but the sign is negative. Therefore the dividend payout ratio is presumably lower during the post-crisis period compared to the pre-crisis period. The signs for pair 1 and pair 2 were in line with the expectations of H1a and H1b. However the sign for pair 3 is in the opposite direction and thus the expectation H1c can already be rejected.

In the last column of Table 2 in the Appendix (part C) the significance is presented. The numbers in this column need to be divided by two since the paired sample t-test used in this paper concerns a one-tailed test and the significance provided in the table is for two-tailed tests. It is a one-tailed test because the sub-hypotheses all indicate that the mean for 1 group is higher than the mean of the other. Therefore the mean difference of pair 1 has a p-value of 0.16 (0.319/2) and the mean difference of pair 2 has a p-value of 0.13 (0.264/2). The p-values compute for the probability of exceeding limits. Meaning that the chance of observing the differences in the values for the means which are observed now are the same for random samples of the same

size if the differences between the values of the means are zero (means are equal). The sub-hypotheses used in this paper are all alternative hypotheses. The null sub-hypotheses of H1a, H1b and H1c are that the means of the groups that form a pair are equal. To be able to reject the null sub-hypotheses the p-value needs to be smaller than 0.05 for a 95% confidence interval and smaller than 0.10 for a 90% confidence interval. The p-value of pair 1 showed to be 0.16 whereas the p-value of pair 2 was 0.13. Meaning that both p-values far exceeded the 95% confidence threshold and even the 90% confidence interval, however, not by a big margin.

These results indicate that the null sub-hypotheses H1a and H1b should not be rejected. The chance of observing the difference in the values of the means, which are observed now when testing other random samples of the same size are respectively 16% (pair 1) and 13% (pair 2). Therefore from a statistical point of view it seems that the mean values of pair 1 (DPR crisis and DPR pre-crisis) and pair 2 (DPR crisis and DPR post-crisis) are equal. Thus the (alternative) sub-hypotheses H1a and H1b need to be rejected resulting in the rejection of all three subhypotheses. Although the expectations for both H1a and H1b seemed to be correct based on the mean difference and the direction of the sign and thus the overall expectation of hypothesis one, that firms change their dividend payout in times of a crisis seemed plausible, it should be concluded that the mean differences between the pairs are statistically insignificant and thus hypothesis one and its sub-hypotheses need to be rejected.

## 5.3 Results of the variables

This section will describe the results regarding the relationships between the dependent variable (dividend payout ratio) and each of the independent variables (profitability, growth opportunities, firm size, earned equity, liquidity) for all periods as used by this paper. Correlation results will be provided for the pre-crisis, crisis, post-crisis and total period (see Table 3 in Appendix D) whereas regression coefficients are provided only for the total period (see Table 4 in Appendix E). The expected relationships based on existing literature will be taken into account and compared with the relationships that are found with the correlation and regression tests. The relationship between dividend payout ratio and the dummy variable crisis will not be discussed here, but in section 5.4.

#### 5.3.1 Profitability (P)

The first control variable in this study is profitability. Profitability is measured by dividing earnings (net. income) by the book value of total assets. First the results will be provided for the correlation analysis, followed by the results of the regression analysis. For the correlation analysis, Pearson correlation is used. Pearson's' correlation examines the strength of a relationship between variables. In Table 3 in the Appendix (part D) the results of the correlation test have been summarized. In the pre-crisis period, the Pearson correlation between dividend payout ratio and profitability was -0.083, whereas this increased to 0.003 in the crisis period and increased further to a significant 0.276 during the post-crisis period. The Pearson correlation for the total sample period was found to be 0.155, however this overall positive relationship was not found to be significant as the p-value for the correlation was 0.177 which is far higher than the 0.05 threshold. The regression results in Table 4 in the Appendix (part E) show that profitability has an unstandardized coefficient of 0.620 for the total sample period (2006-2012), indicating a positive relationship. An increase in profitability does lead to in an increase in dividend payout ratio. However, the p-value of the regression is 0.647, which is again far above the 0.05 threshold.

Overall it can thus be said that although both the correlation and regression analysis indicate a positive relationship between dividend payout ratio and profitability in this sample for the overall period (as was also expected by the outcomes of the literature review), this relationship is statistically insignificant because both p-values far exceeded the 0.05 threshold.

#### 5.3.2 Growth opportunities (GO)

The second control variable of interest concerns growth opportunities. Recall that growth opportunities are measured by dividing market value by the book value of total assets. As with profitability, first the correlation results will be provided followed by the unstandardized coefficient of the regression analysis. In the pre-crisis period, the Pearson correlation between dividend payout ratio and growth opportunities was -0.003, whereas this increased to 0.131 during the crisis period and 0.141 in the post-crisis period. The Pearson correlation for the total period was found to be 0.089 with a p-value of 0.452, which indicates a very weak positive relation between the variables. The unstandardized coefficient obtained form the regression analysis showed to be 0.122 with a p-value of 0.400. Which indicates again a rather weak positive relation. Although the results of the correlation and regression analysis both indicate a positive relationship between dividend payout ratio and growth opportunities for the total period, which is contrary to the expected negative relationship, it can be said that the positive relationship that is found in this sample is not significant as all p-values exceeded the 0.05 threshold.

#### 5.3.3 Firm size (FS)

The proxy firm size is constructed by taking the natural log of total assets in millions. The following outcomes were observed for the correlation analysis. In the pre-crisis period, the Pearson correlation between dividend payout ratio and firm size was 0.051, whereas this decreased to -0.045 during the crisis period before increasing slightly to 0.007 in the post-crisis period. The Pearson correlation for the total period was found to be 0.020 with a p-value of 0.859. The regression analysis showed an unstandardized coefficient of 0.016 with a corresponding p-value of 0.170. It can thus be said that although both tests indicate a positive relationship for the total period (as was expected by the outcomes of the literature review) this relationship is rather indifferent because of its weakness and because all p-values far exceed p < 0.05.

#### 5.3.4 Earned equity (EE)

The equation of the variable earned equity divides total retained earnings by total book value of equity. Correlation outcomes for the relationship between dividend payout ratio and earned equity are as follows: -0.080 for the pre-crisis period, -0.040 during the crisis period and a significant value of 0.269 for the post-crisis period. The Pearson correlation for the total period was found to be 0.212 with a p-value of 0.062. This indicates a rather positive relationship for the total period based on the correlation analysis, which is nearly significant at a 95% confidence interval as the p-value of 0.062 is close to 0.05. Note that the p-value does show to be significant at a 90% confidence interval, since 0.062<0.1. The regression analysis however shows a weak positive relationship between dividend payout ratio and earned equity, which is far from significant with an unstandardized coefficient of just 0.062 and a p-value of 0.700. Overall it can thus be concluded that both tests indicate a positive relationship for the total period. Although the positive correlation was found to be nearly significant at a 95% confidence interval and significant at a 90% confidence interval, also a weak, insignificant positive unstandardized coefficient was found. Therefore this relationship is again rather indifferent and thus the expectation of a significant positive relationship between dividend payout ratio and earned equity cannot be confirmed.

#### 5.3.5 Liquidity (L)

The relation between dividend payout ratio and liquidity is the last relationship that is described in this section. Recall that this study uses the current ratio to measure liquidity, which is total current assets divided by total current liabilities. In the precrisis period, the Pearson correlation between dividend payout ratio and liquidity was -0.168, opposed to -0.142 during the crisis period before increasing to 0.054 in the post-crisis period. The Pearson correlation for the total period was found to be negative -0.131 with a p-value of 0.253. The regression analysis showed an unstandardized coefficient of -0.159 with the p-value of 0.220. Although the results of the correlation and regression analysis both indicate a negative relationship between dividend payout ratio and liquidity the total period, which is contrary to the expected positive relationship, it can be said that the negative relationship that is found in this sample is not significant as all p-values exceeded the 0.05 threshold.

## 5.4 Regression analysis

This section will describe the relationship between dividend payout ratio and the dummy variable crisis based on the results of the regression analysis. The results of this regression (see Table 4 in Appendix E) will be used in order to test the second hypothesis of this paper (H2). Furthermore the results regarding the overall validity of the model will be highlighted in the latter stage of this section.

The second hypothesis (H2) of this study was constructed in order to test whether the change in dividend payout ratio (H1), is due to the crisis. By looking at Table 4 in the Appendix (part E) it seems that there exist a rather positive relationship between dividend payout ratio and the dummy variable crisis. The unstandardized coefficient of the dummy variable crisis is 0.385 the significance is indicated by a corresponding p-value of 0.074. Although this p-value is over the 0.05 threshold and this finding is thus statistically insignificant at a 95% confidence interval, the p-value that was found is significant at a 90% confidence interval since 0.074<0.1. Therefore this finding does provide some evidence to conclude that the crisis has indeed a positive impact on the dividend payout ratio. In other words, dividend payout ratio seems to increase in times of a crisis. Hence the second hypothesis (H2) is therefore (partially) accepted.

A model summary is presented in Table 4 in the Appendix (part E) as well, describing the effects of each variable on dividend payout ratio. First of all, it becomes apparent that only 8.6% of the total variance of dividend payout ratio is explained by this model. This is the value of the adjusted R square (0.086). The adjusted R square is a statistical term that shows how good one variable is at predicting another. In this regression analysis, the independent variables profitability, growth opportunities, firm size, earned equity, liquidity and the dummy variable crisis were pooled together. So that the adjusted R square value resembles how good this pool of independent variables is in predicting the dependent variable dividend payout ratio for the total period of this study (2006-2012). Although the adjusted R square value of 0.086 thus indicates a rather weak but nevertheless positive correlation between dividend payout ratio and the independent variables, the model does show to be valid with a p-value of 0.001. This means that based on a 99% confidence interval, there has to be at least one coefficient in this model (coefficient of one of the independent variables), which is not equal to zero. Therefore these results indicate that as the independent variables that are used by this study increase in value, so does the value of dividend payout ratio.

# 6. CONCLUSION AND IMPLICATIONS

#### 6.1 Conclusion

This paper intended to answer the following research question: "To what extent has a financial crisis impact on the dividend payout of Dutch publicly listed firms?" by examining the dividend payout of 78 Dutch publicly listed firms over the total period of 2006-2012. Furthermore three periods were distinguished in order to make assumptions regarding the research question; the pre-crisis period (2006-2008), the crisis period (2009) and the post-crisis period (2010-2012). First background information about the financial crisis was provided, followed by a literature review on dividends. Two hypotheses were constructed based on the outcomes of the literature review. The study adopted a model from Denis and Osobov (2008) in order to test both H1 and H2. Finally the results were analyzed and discussed to give an outcome to the central research question as stated above.

Overall it can be said that the financial crisis did not show to have a statistical significant impact on the dividend payout of Dutch publicly listed firms. However the results of this study do imply that dividend payout ratio is moderately affected by the financial crisis, although not statistically significant. Firstly descriptive statistics showed that dividend payout ratio is much higher during the crisis period as opposed to the pre- and postcrisis period, with a mean value over two times as high during the crisis period.

Secondly the results of the mean comparisons showed that although sub-hypotheses H1a and H1b seemed to be right predictions, they still had to be rejected because they were statistically insignificant. However both mean differences were substantial and not far away of being statistically significant. It seemed that for the non-crisis periods the mean values for dividend payout ratio are equal. However compared with the crisis period both periods showed to have substantially lower dividend payout ratio. Therefore it thus seems that the dividend payout ratio is indeed higher during the crisis period opposed to the pre- and post-crisis period. Although the results were not statistically significant, the findings were in line with the findings of Floyd et al. (2014).

Thirdly, all relationships between the variables showed to be insignificant at a 95% confidence interval and some relations were not even in line with the expectation. Both the correlation and regression analysis pointed out that although the variables profitability, firm size and earned equity had the correct sign according to the expectation, the relationship found was indifferent based on both tests. Furthermore the variables growth opportunities and liquidity showed an opposite sign as expected, but statistically insignificant as well. Hence non of the variables which are adopted from the model of Denis and Osobov (2008) showed to be significant determinants for dividend payout ratio for Dutch publicly listed firms in the period as used by this study (2006-2012).

Fourth and finally, the dummy variable crisis showed to have a positive unstandardized coefficient as was expected with a corresponding p-value close to being significant at a 95% confidence interval, but being significant at a 90% confidence interval. Therefore keeping in mind the results of the descriptive statistics, the mean comparisons and these results on the dummy variable crisis of the regression analysis, according to this study, although hard statistical significant evidence is not present, the crisis did have a positive impact on the dividend payout ratio of Dutch publicly listed firms. With total earnings decreasing in times of a crisis, total dividend payouts thus seem to stable in times of a crisis.

# 6.2 Limitations

Some factors may have caused the multiple statistically insignificant results that were found by this study, so that the conclusion of this paper is not hundred percent valid as no solid statistical evidence is present. The first limitation is that as with more studies, this study suffers from subjectivity. This paper defines the variables firm size for example as natural logarithm of total assets. However, using other definitions for this variable as well as all the other variables used by this study could result in different outcomes of all analyses. Secondly the crisis period could potentially be wrongly interpreted. In this study the year 2009 forms the crisis period as 2009 shows a severe value decrease in GDP, total imports and total exports (see Figure 2 in Appendix A). However, the crisis already started in 2007 and had a major impact in the US in the year 2008. Therefore, this could lead to different interpretations of when the crisis actually begun. Hence interpreting a different period of the crisis period could results in different outcomes of all analyses. The third and final limitation to be discussed is the small sample size of 78 firms as adopted by this study. Since only Dutch publicly listed firms were taken into account, all unlisted firms were excluded from the analysis. A suggestion for future research could thus be to increase the sample size by including more firms, for example: small firms, large firms and unlisted firms. Furthermore as this study only focused on Dutch firms, future research could also include more countries and perform cross sectional analyses to make a comparison between different countries. So that solid evidence can be provided instead of potential coincidental results.

# 6.3 Practical implications

The focus of this paper is on the impact of a financial crisis on the dividend payout of Dutch publicly listed firms. Although the results of this paper could potentially provide investors/shareholders with information on how to handle when a financial crisis occurs, by giving more insight in the dividend payout of firms in times of a crisis, all crises are different even though they have the same characteristics. Furthermore only Dutch firms were used in this research. Therefore it should be said that the results of this study are not generalizable for other countries and for financial crises in the past or the future as only the effects on dividend payout of the global financial crisis of 2007 were analyzed by this study.

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## 8. APPENDIX

# A: FIGURES

Figure 1: Primary Incomes Including Incomes from Abroad in Euros.

Saldo primaire inkomens met het buitenland



	Figure 2: Ex	penditure A	pproach	to GDP	of the l	Netherlands.
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	Onderwerpen	Expenditure approach to GDP					
		Disposable for final	expenditure	Final expenditure			
		Gross domestic product	Imports of goods and services	Exports of goods and services			
			Total	Total	Exports of goods	Exports of services	
Dimensions	Periods	%					
Value, on previous period (q/q)	2006	5.2	12.1	10.1	12.2	2.1	
	2007	5.8	7.3	7.8	8.2	6.1	
	2008	4.0	7.1	6.9	5.9	11.1	
	2009	-3.6	-12.6	-13.3	-17.0	1.3	
	2010	2.4	17.4	17.5	20.2	8.6	
	2011**	2.1	8.8	8.8	9.8	5.3	
	2012*	0.0	5.8	5.0	5.9	1.8	

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# **B. DESCRIPTIVE STATISTICS**

	Variable	Minimum	Maximum	Mean	Median	Std. Deviation	N (missing)
	Dividend Payout Ratio	-4.37	3.56	0.36	0.36	1.01	64 (14)
	Profitability	-0.16	0.42	0.08	0.07	0.07	70 (8)
Pre-Crisis	Growth Opportunities	0.24	4.74	1.32	1.13	0.81	65 (13)
	Firm Size	15.59	25.01	20.26	20.40	2.02	70 (8)
	Earned Equity	-1.65	1.60	0.40	0.42	0.48	70 (8)
	Liquidity	0.51	9.04	1.69	1.46	1.10	70 (8)
	Dividend Payout Ratio	-2.03	11.11	0.63	0.29	1.76	54 (24)
	Profitability	-0.47	0.38	0.03	0.05	0.13	70 (8)
Crisis Post-Crisis	Growth Opportunities	0.05	2.95	0.71	0.65	0.43	65 (13)
	Firm Size	13.47	25.06	20.46	20.59	2.13	71 (7)
	Earned Equity	-1.64	7.58	0.55	0.46	1.01	70 (8)
	Liquidity	0.55	7.29	1.52	1.28	0.96	71 (7)
	Dividend Payout Ratio	-3.21	2.42	0.24	0.23	0.76	73 (5)
	Profitability	-0.20	0.24	0.04	0.04	0.08	78 (0)
	Growth Opportunities	0.11	6.53	0.97	0.80	0.84	73 (5)
	Firm Size	16.52	25.15	20.63	20.61	2.01	78 (0)
	Earned Equity	-2.75	2.06	0.32	0.33	0.67	78 (0)
	Liquidity	0.53	3.38	1.43	1.31	0.66	78 (0)
Total	Dividend Payout Ratio	-2.43	3.56	0.33	0.26	0.80	78 (0)
	Profitability	-0.19	0.25	0.06	0.05	0.07	78 (0)
	Growth Opportunities	0.16	5.25	1.05	0.90	0.71	73 (5)
	Firm Size	15.68	25.08	20.51	20.55	2.01	78 (0)
	Earned Equity	-2.75	1.86	0.35	0.42	0.63	78 (0)
	Liquidity	0.58	3.49	1.52	1.40	0.68	78 (0)

### Table 1: Summary of the Descriptive Statistics.

Dividend payout ratio is measured by dividing total cash dividends by total net earnings. Profitability is measured by dividing net income by total assets. The variable growth opportunities is measured by dividing market value by total assets. The variable firm size is defined as the natural logarithm of total assets. All values used for total assets are derived from the balance sheet total. However for the variable firm size this is adjusted by the natural logarithm. The variable earned equity is measured by dividing total retained earnings by the total book value of equity. Lastly, liquidity is measured by dividing total current assets by total current liabilities

# C. MEAN COMPARISONS (PAIRED SAMPLE T-TEST)

		Mean	Ν	Mean Difference	Sig. (2-tailed)
Pair 1	DPR_Crisis	0.633	50	0.286	0.210
	DPR_PreCrisis	0.348	50	0.280	0.319
Pair 2	DPR_Crisis	0.647	53		0.264
	DPR_PostCrisis	0.345	53	0.301	
Pair 3	DPR_PostCrisis	0.276	60	-0.003	0.978
	DPR_PreCrisis	0.279	60	0.000	

# **Table 2: Paired Samples Statistics**

This table shows the mean values of dividend payout ratio for the pre-crisis, crisis and post-crisis period. Furthermore the number of observations is provided in this table as well as the differences in mean values for dividend payout ratios between three periods. Pair 1 differentiates between the crisis and the pre-crisis period, pair 2 between the crisis and post-crisis period whereas pair 3 differentiates between post-crisis and the pre-crisis period. Results of the mean difference are based on a 95% confidence interval. See Table 1 for the definition of dividend payout ratio.

# D. CORRELATION ANALYSIS

		Expected Relationship	DPR_PreCrisis	DPR_Crisis	DPR_PostCrisis	DPR_Total
	Pearson Correlation		083	.003	.276**	.155
Profitability	Sig. (2-tailed)	+	.513	.984	.018	.177
	Ν		64	52	73	78
Crowth	Pearson Correlation		003	.131	.141	.089
Opportunities	Sig. (2-tailed)	-	.981	.371	.251	.452
	Ν		60	49	68	73
Firm Size	Pearson Correlation		.051	045	.007	.020
	Sig. (2-tailed)	+	.689	.752	.955	.859
	Ν		64	52	73	78
Earned Equity	Pearson Correlation		080	040	.269**	.212*
	Sig. (2-tailed)	+	.530	.776	.021	.062
	Ν		64	52	73	78
	Pearson Correlation		168	142	.054	131
Liquidity	Sig. (2-tailed)	+	.183	.317	.653	.253
	Ν		64	52	73	78

### Table 3: Determinants of Dividend Payout Ratio (Correlation).

This table shows the Pearson correlations, 2-tailed significance, and the number of observations in relation to dividend payout ratio for the pre-crisis, crisis, post-crisis, and total period. The 'expected relation' column is based on the literature review. See Table 1 for the definitions of the variables. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).

# E. REGRESSION ANALYSIS

	Expected Relationship	В	Sig.
Profitability	+	.620	.647
Growth Opportunities	-	.122	.400
Firm Size	+	.016	.170
Earned Equity	+	.062	.700
Liquidity	+	159	.220
Dummy Crisis	+	.385*	.074
Adjusted R square			0.086***
Ν			234

This table shows the unstandardized coefficients in relation to dividend payout ratio for the pre-crisis, crisis, postcrisis, and total period. The 'expected relation' column is based on the literature review. Furthermore the R-square of the model is provided by the table as well as the total number of observations. See Table 1 for the definitions of the variables. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).