Comparing dividend policies between Germany and the Netherlands: a test of the life-cycle theory

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ABSTRACT
This paper compares the dividend policies of German and Dutch firms on the basis of the life-cycle theory of dividends. Evidence for the life-cycle theory can be found for Germany whereas the Netherlands show no significant results for it but tend to pay out dividends in order to signal profitability. For Germany, the signaling theory as well as the clientele effect does not play a significant role in determining dividend policy. The life-cycle stages are determined by the earned/contributed capital mix which suggests that firms with high earned capital are mature and more likely to pay out (high) dividends. Germany and the Netherlands both pay out low dividends. The study in this paper indicates that dividend payout in both countries is also related to industry-specific characteristics.

Supervisors: Henry van Beusichem, Xiaohong Huang

Keywords
dividend policy, Germany, Netherlands, life-cycle theory, signaling theory, payout

1st IBA Bachelor Thesis Conference, June 27th, 2013, Enschede, The Netherlands.

1. INTRODUCTION

Dividend policy is one of the most important subjects in corporate finance and refers to the amount and time pattern of earnings a company pays out to its shareholders in dividends (Hillier, Clacher, Ross, Westerfield & Jordan, 2011). Many researchers have devoted their work in explaining which factors and theories actually affect a company's decision to pay dividends. Related to this, the fact that in the US and Europe the total amount of dividends paid has increased but at the same time the fraction of firms that pay dividends has declined over the past 45 years (von Eije & Megginson, 2008; DeAngelo, DeAngelo & Stulz, 2006), gives implications on which theories regarding dividend policy can be considered to be first-order determinants and which are (at most) second-order determinants (DeAngelo, DeAngelo & Skinner, 2004). DeAngelo et al. (2006) argue, for example, that the clientele effect and the signaling theory cannot be a first-order determinant when dividends are concentrated among a small number of large firms. In contrast, they extended the life-cycle theory by combining elements of the agency theory (as described by Jensen (1986)) with the development of a firm's investment opportunities. As a result, firms in their early years will pay few or no dividends because of high investment opportunities and low internally generated capital. After some years, however, with a lower level of investment opportunities, firms are more willing to pay out the excess funds in order to avoid a waste of free cash flows (DeAngelo et al., 2006). This is in line with the findings from other papers such as the ones by Fama and French (2001) and Denis and Osobov (2008).

When studying dividend policies of certain countries from a life-cycle perspective, the existing literature is strongly concentrated on studies about US-American and British companies (see DeAngelo et al., 2006.) or it is referred to a whole continental or economic region like the European Union (for example, von Eije & Megginson, 2008). Therefore, this paper will examine and compare the dividend policies based on the life-cycle theory of Germany and the Netherlands. Both countries are attractive in two different aspects: First of all, both have well established capital markets and the most relevant financial data are easily available. Second, in contrast to the Anglo-Saxon countries, Germany and the Netherlands are civil law countries and have stakeholder-oriented governance systems which might lead to different results in the payout policy. To my knowledge, there is also no study available which has tested the life-cycle theory for its application on Dutch firms. As a result, a direct comparison from a life-cycle perspective between Germany and the Netherlands has not been made, yet. This paper will eventually contribute to the literature in various ways: First, the life-cycle theory will be tested on Dutch firms. Second, the sole paper which studied the dividend policy of German firms from a life-cycle perspective used a sample period from 1989 to 2002 (Denis & Osobov, 2008). In this paper, firms in the period from 2006 to 2012 are considered so this study might reveal changes in the dividend policy of German firms. However, the main research question which will be investigated in this paper: *How do dividend policies based on the life-cycle theory differentiate comparing Germany and the Netherlands?*

The approach that is taken in order to analyze and compare the dividend policies of both countries is similar to the one by DeAngelo et al. (2006), i.e. the ratios of retained earnings over total equity and total assets will be used as the main-determinants for life-cycle stages. They will also be controlled for total equity over total assets, return on assets, the sales growth rate and the ratio of cash over total assets. Dummy variables are assigned to each variable indicating a low or high score which will be used in order to verify with an independent samples t-test whether the means of the dividend ratio for each dummy variable differs significantly[1]. Relevant financial data will be obtained from the database ORBIS.

In this study, evidence is found for a life-cycle theory of dividends for German firms but not for Dutch firms. The results rather suggest a signaling theory for Dutch firms regarding the payout level whereas the propensity to pay out dividends seems to be rather flexible. As a side-effect of this study, the data shows that the industry a company is operating in seems to play an important role in determining the dividend payout as well.

The rest of the paper is organized as follows: Section 2 is dedicated to a review of existing literature about the relevance of dividend policy and the life-cycle theory as well as recent studies of the dividend policies of Germany and the Netherlands. Section 3 will describe the methodology that is used in order to be able to compare the payout policies of Germany and the Netherlands. The results and their implications are reported in sections 4 whereas section 5 concludes the paper.

2. THEORY REVIEW

2.1 Relevance of Dividend Policy

In their paper from 1961, Miller and Modigliani (MM) argue that dividend policy does not matter in frictionless markets. In reality, though, markets are not frictionless due to flotation costs, taxes, etc. That is the reason why dividend policy concerning payout ratios does matter in real world scenarios. Litner (1956) is one of the first who studied the preferences of US-managers concerning dividend policy. The interviews he conducted with them support the common assumption that managers prefer stable dividends and try to avoid dividend cuts. Even though Litner (1956) does not test or tries to develop a certain theory in his paper, his findings imply an informational role of dividends which form the basis for the signaling theory. The signaling theory suggests that – since costs are attached in issuing dividends - a dividend-paying firm is perceived to be profitable and have high future free cash flows so that firms signal profitability in order to attract investors (Aivazian, Booth & Cleary, 2003). Despite the signaling theory, other theories have developed which try to explain when and how firms pay out dividends. For example, in line with the clientele effect, there are certain types of investors which prefer low dividends because they might have to pay high income taxes or because of restricted dividends (Hillier et al., 2011). Similar to the clientele effect is the catering theory as proposed by Baker and Wurgler (2004). It states that managers will increase dividend payments if dividend-paying firms are valued higher than non-paying firms and vice-versa.

Regardless of the fact that perfect (frictionless) capital markets do not exist in the real world, DeAngelo and DeAngelo (2007)

[1] Initially, it was planned to determine the life-cycle stages via an Exploratory Factor Analysis. However, for both samples the Kaiser-Meyer-Olkin measure as well as the Bartlett's Test of Sphericity showed that they are not adequate to extract factors. As can also be seen in the results of the regression analysis for Germany in Table 3 in the appendix, the variables RE/TE, RE/TA and TE/TA show some collinearity which is why these variables in the factor analysis have always been bundled together but have neglected any relationship with the other variables and therefore, would not have represented appropriate factors.

criticize the MM model also in other respects. According to Miller and Modigliani (1961), investment policy is considered to be the only determinant because they assume 100% free cash flow and do not allow retention of earnings. Nevertheless, as DeAngelo and DeAngelo (2007) claim, maximizing the project NPV (i.e. choosing the right investment policy) only creates the capacity to distribute earnings. However, the value for investors is only existent when the returns on that investment lead to actual payouts, which is why payout policy is equally important as is investment policy, providing that retention is allowed. Nevertheless, since retention of earnings is allowed and managers decide how to distribute the free cash flow, agency problems may arise (Jensen, 1986). Jensen defines free cash flow as the "cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital" (p. 2). The issue with substantial free cash flow is how to prevent managers from investing in projects which have no value to the firm but only increase the power of the managers. Agency problems thereby seem to play an important role why dividend policy matters in the end and why it is also important to investigate other theories. As has already been mentioned above, DeAngelo et al. (2006) used the findings of Jensen's paper to extend the life-cycle theory of dividends which will be used as the underlying theory in this paper to compare the dividend policies between Germany and the Netherlands. The next section will, therefore, give a literature overview about how the life-cycle theory developed and what its implications are.

2.2 Implications of the Life-cycle Theory

Originally developed as a marketing concept, the life-cycle theory has been extended to other areas such as microeconomics, management and finance (Yan, 2006). Applying the theory to dividend policy, it predicts that the dividend payout varies among different stages of a firm's life-cycle. At the beginning, firms are likely to make high investments and exploit their opportunities so dividend payout is low or even not existent (Anthony & Ramesh, 1992). As the firm matures and becomes bigger, dividend payout increases but it again decreases once profitability decreases (DeAngelo & DeAngelo, 2006). A drawback of the life-cycle theory is that there is neither an exact definition of each stage nor a standard methodology of how to identify life-cycle stages (Yan, 2006). Even the number of stages differs across papers. Miller and Friesen (1984), for example, identified five phases which they referred to as Birth Phase, Growth Phase, Maturity Phase, Revival Phase and Decline Phase. Controlling variables were Situation, Organization and Innovation and Strategy as well as quantitative variables, Firm Age and Sales Growth. Miller's and Friesen's classifications implied that as the firm grows bigger through innovative phases, organizational structure must become more formal and sophisticated as well as establishing organizational competences. In the maturity and decline stages, these organizational competencies need to be exploited through efficiency.

One of the first papers that investigated the relation between life-cycle theory and dividend policies is the article by Mueller (1972). Mueller suggested that there are managerial diseconomies of scale, i.e. a mature firm cannot invest at a reasonable rate of return like firms in a growth stage can. This finding suggests that shareholders of mature firms prefer dividends over retentions. Grabowski and Mueller (1972) further expanded Mueller's research on the investment opportunities of mature firms across industries and confirmed his findings for companies which are not operating in technology-progressive firms.

Anthony and Ramesh (1992) carried out a univariate analysis as well as a multivariate analysis. The former led to three life-cycle stages, namely "growth", "mature" and "stagnant" whereas the latter identified two additional stages which are called "growth/mature" and "mature/stagnant". In contrast to Miller and Friesen, Anthony and Ramesh used quantitative variables only. These were dividends, sales growth, capital expenditure and firm age. Their findings suggested low dividend payout for young firms with high sales growth (Growth Stage) and high payout for older firms with low growth rates (Mature Stage).

Just like Anthony and Ramesh, Dickinson (2011) used accounting information in order to determine life-cycle stages. Her main determinants are the cash flow patterns of firms, including operating, investing as well as financing cash flows. She claims that cash flow patterns capture the five life-cycle stages which were identified by Gort and Klepper (1982), namely introductory, growth, maturity, shake-out and decline stage. Different cash flow patterns indicate future profitability of a firm. Her findings suggest that mature firms' future excess returns are most likely in the mature phase.

Fama and French (2001) as well as Grullon, Michaely and Swaminathan (2002) further investigated that mature firms with high profitability (and low growth rates) tend to pay dividends rather than firms with low profitability and high investment opportunities. These findings are again in line with a life-cycle theory of dividends which implies that dividend payout is dependent on the trade-off between the advantages like flotation costs savings and disadvantages such as the agency costs of free cash flows.

The work by Fama and French (2001) forms the basis for the study of DeAngelo et al. (2006) who added further variables in testing the life-cycle hypothesis for US-American firms. They used the ratios of retained earnings over total equity (RE/TE) and total assets (RE/TA) as main-determinants for life-cycle stages. DeAngelo et al. obtained significant results suggesting that firms with a high RE/TE and a high RE/TA (earned/contributed capital mix) are more likely to pay dividends, controlling for firm size, current and recent profitability, growth, total equity, cash balances as well as dividend history.

Denis and Osobov (2008) are the first who studied the effect of the earned/contributed capital mix outside the US and found evidence for a positive correlation in Canada, UK, Germany, France and Japan in the time period between 1981 and 2002. Their results also suggest that dividend-paying firms are concentrated among the largest and most profitable firms. This is consistent with the life-cycle theory in which the distribution of free cash flow is the primary determinant of dividend policies.

Von Eije and Megginson (2008) conducted a study about dividends and share repurchases of countries that were part of the European Union from 1989 until its enlargement in May 2004. Their findings confirm these of Denis and Osobov (2008) concerning a large concentration of dividend-paying firms and high profitability. However, they did not find a significance correlation between the earned/contributed capital mix and the likelihood to pay dividends but argue that firm age is the main-determinant.

Before explaining the methodology that is used in this paper to compare the two countries, a short summary will be given in the next two sections about what past studies revealed about the dividend policies of Germany and the Netherlands.

2.3 Dividend Policy in Germany

Germany has a stakeholder-oriented governance system which is characterized by strong ownership concentration and banks being part of the board. According to Gugler and Yurtoglu (2003), strong ownership implies that managers do not have considerable discretion in order to signal cash flows or make the theory of free cash flows likely determinants of German dividend policy. Rather, the conflict lies between large and controlling shareholders and small outside shareholders. Gugler and Yurtoglu, therefore, point out to the rent extraction property of dividends which indicates that a decrease in dividend payout is based on expropriation of small shareholders and decreases the market value of a firm. Due to the strong shareholder concentration, the agency problems of free cash flows as described by Jensen (1986) are less likely to play an important role for German firms than they do for Anglo-Saxon companies because managers have less discretion.

Andres, Betzer, Goergen and Renneboog (2009) found evidence that German firms are more willing to cut dividends if profits decrease. This suggests that profitability is a significant factor to determine the amount of dividends German firms pay out to their shareholders. These findings are in line with the results of the study by Goergen, Renneboog and Correia da Silva (2005) who also found out that German firms even omit dividends if profitability is lower only on a temporary basis. Furthermore, they studied the role of banks as controlling shareholders and their impact on dividend policy. Their results revealed that if bank control is high, the firm is more likely to omit dividends in case of negative earnings. A possible explanation is that low or no dividend payout serves as a greater security for debt (Amihud & Murgia, 1997).

As has already been stated in the previous section, Denis and Osobov (2008) tested the earned/contributed capital mix for Germany and found that there is a significant positive relation to dividend payout. Just like DeAngelo et al. (2006) have found for US-firms, dividend payouts in Germany have not declined during their sample period and they are concentrated among the largest and most profitable firms. Therefore, the signaling theory and clientele effect are less likely to hold in Germany. In addition, no evidence for the catering theory could be found. As the findings of Denis and Osobov (2008) are consistent with the findings of DeAngelo et al. (2006), they call upon the strength of the life-cycle theory in explaining (German) dividend policy.

2.4 Dividend Policy in the Netherlands

Up to now, there are not many studies available examining the dividend policy of the Netherlands. As a civil law country with a stakeholder-oriented governance system and strong ownership concentration, it can be assumed that Dutch firms have a similar dividend policy to German firms. However, the corporate governance system of the Netherlands is quite unique in that the rights of shareholders can be significantly restricted by a legally imposed governance regime, i.e. if a domestic Dutch firm has more than 100 employees, a legally installed work council and book value of shareholders' equity of more than 11.4 million euros, the firm is legally required to operate under a so-called "structured regime" (De Jong, DeJong, Mertens & Wasley, 2005). Exceptions to the rule include multinational Dutch firms with more than half of their employees working outside the Netherlands. Nonetheless, these firms are allowed to voluntarily retain the structured regime and in most cases do so. In essence, this regime tries to simplify consensus-seeking among various kinds of stakeholders, in particular between employers and employees (Renneboog & Szilagyi, 2006). This is done by giving the work council a role in the supervisory boards whereas the rights of the shareholders decrease which also refers to their influence on determining dividend policy. The dividend policy under the structured regime in Dutch companies is established and approved by the managers and the supervisory board whereas the shareholders only formally approve it (De Jong et al., 2005).

Renneboog and Szilagyi (2006) studied the dividend behavior of Dutch firms under the structured regime to investigate the impact of shareholder power restriction on dividend payout. Initially, it had been assumed that dividend payout is rather high as dividends could be used as a monitoring device in order to decrease agency costs. Their analysis, though, showed the opposite: a low payout ratio and smoothed dividends. Evidence for the agency theory related to free cash flows – which was measured by firm size, leverage and investment opportunities – could also not be found in their study. Rennebook and Szilagyi conclude that this is due to the fact that shareholders are too weak to push optimal payout policies. In addition, net income was not regarded as a main-determinant for dividend policy but operating cash flow was. These findings do not support the life-cycle theory of dividends but suggest a rather flexible dividend policy for Dutch firms.

3. METHODOLOGY

3.1 Sample

The research question that is investigated in this paper is: *How do dividend policies based on the life-cycle theory differentiate comparing Germany and the Netherlands?* Naturally, the sample consists of German firms which are listed at all German stock exchanges (Berlin, Düsseldorf, Frankfurt, Hamburg, Hannover, Munich, Stuttgart and XETRA) and Dutch firms listed at Euronext Amsterdam. Banks and insurance companies are excluded in both samples due to stricter regulations or different accounting standards. The focus is on the period from 2006 up to 2012. The necessary financial data was obtained from the data base ORBIS and in order to be included in the sample in a given year, the firms must have non-missing values on all variables which were selected to investigate the dividend policies of both countries (see section 3.3). In total, the sample includes 1,202 observations across sixteen different industries for Germany and 275 observations across fourteen different industries for the Netherlands. The industries are classified by the Statistical Classification of Economic Activities in the European Community (NACE).

3.2 Hypotheses

Similar to the work of DeAngelo et al. (2006), the ratios of retained earnings over total equity (RE/TE), respectively over total assets (RE/TA), are assumed to be the main-determinants of a firm to pay out (high) dividends. It is predicted that firms with high RE/TE and high RE/TA are mature firms and hence, more likely to pay out dividends. This will be controlled by the TE/TA ratio (total equity/total assets) whereas it is assumed that dividends are higher when the TE/TA is high.

Recent studies (Fama & French, 2001; DeAngelo et al. (2006); Denis & Osobov, 2008) found a positive relationship between profitability and the likelihood of a firm to pay out (high) dividends.

Firms which have a high sales growth rate are in general likely to be in the growth phase according to the life-cycle theory. Among others, Fama and French (2001) found evidence that firms with a high sales growth rate are less likely to pay out dividends because they have many positive investment opportunities and tend - as a result – not to retain their earnings but rather invest it to create greater revenue.

Last but not least, the impact of low/high cash holdings on cash dividend payments will be investigated. A high cash/total assets ratio can have two meanings: On the one hand, large cash holdings can be regarded as resources in order to finance upcoming promising investment projects. Those firms are, therefore, less likely to pay out dividends (DeAngelo et al., 2006). On the other hand, large cash holdings can be excess funds and most likely to be paid out in dividends. In this paper, it is initially assumed that large cash holdings serve as an indicator for investments so that the dividend ratio is low when the ratio of Cash/Total Assets is high.

3.3 Variables

As has already been indicated above, the variables were chosen based on the earned/contributed capital mix of DeAngelo et al. (2006). The main variables are the RE/TE and the RE/TA ratios. The former measures the extent to which a firm is financing its projects internally or externally whereas the RE/TA ratio focuses on financing a firm's assets (DeAngelo et al., 2006). This indicates that if this ratio is high, firms are likely to have accumulated a sufficient amount of profits and are not completely reliant on external sources of financing its projects.

In order to identify the relationship between total equity and total liabilities, the ratio of total equity over total assets can be used. DeAngelo et al. (2006) report that firms with a low TE/TA ratio are less likely to pay dividends as this can indicate that a firm is in financial trouble. However, their findings also revealed that a high TE/TA ratio does not automatically imply a high payout ratio because high total equity can either be earned or contributed.

It must be noted that stock repurchases can cause the total equity of the shareholders to drastically decline whereas retained earnings remain the same and so can overstate the RE/TE and RE/TA ratios. As a result, firms that have a negative total shareholder's equity will be excluded from the sample.

The measurement of the other variables is straight forward: Profitability is measured by ROA (return on assets) and growth by the sales growth rate (SGR) which is computed by the change of the sales divided by the previous year's sales. Last but not least, the ratio of cash over total assets consists of dividing cash and equivalents by total assets.

3.4 Method of Analysis

The method for analyzing the different dividend policies of Germany and the Netherlands will be similar to the approach which DeAngelo et al. (2006) have used in their study. In that regard, the life-cycle stages will be estimated by the firms' amount of retained earnings relative to total equity (RE/TE) and total assets (RE/TA). In addition, it will be controlled for profitability (measured as return on assets ROA), the ratio of total equity over total assets (TE/TA), the sales growth rate (SGR) as well as the ratio of cash and equivalents over total assets (Cash/TA). For each variable, the median values over the sample period for both countries will be calculated. The medians will serve as an orientation in order to assign the different variable scores dummy variables which are either "0" for a low score or "1" reflecting a high score on the variable at hand. The dummy variables will be used to carry out an independent samples t-test (one-tailed). With this test, it is possible to check whether there is a significant difference between the means of the low- and high-scoring firms on each variable on the dividend ratio (cash dividends divided by net income). Even though not all variables are normally distributed, the test can be used because the sample size is big enough. In the end, for both samples a regression analysis will be implemented in order to verify the implications of the independent samples t-test.

In order to analyze the propensity to pay dividends among the two samples, another dummy variable will be created. A "0" will represent firms that do not pay dividends and a "1" for firms which do pay dividends. This dummy variable will then be tested on the variables explained above using an independent samples t-test again.

4. RESULTS AND DISCUSSION

4.1 Results

The independent samples t-test is carried out using the dividend ratio as the dependent variable and RE/TE, RE/TA, TE/TA, ROA, the sales growth rate (SGR) and Cash/TA as independent variables. After that, a linear regression is executed with the dividend ratio again as the dependent variable.

4.1.1 Germany

The mean dividend ratio of German firms in the studied time period is about 35% (median: ca. 31%). The minimum dividend ratio in the sample is ca. -51% and the maximum is ca. 127% (summary statistics can be found in Table 1 in the appendix). 89 out of 1,202 firms did not pay dividends so roughly 93% were dividend payers between 2006 and 2012.

The mean dividend payout ratios range from 26% in 2010 to 40% in 2012. In 2006, it has a median ratio of 30%, 29% in 2007 and 2008, 34% in 2009 and 32% in 2011. Differences in the payout ratios across industries can also be observed for Germany. The lowest payout ratio has the Hotels & Restaurants industry with 0% but since there are only five firms included in the sample, it is not a significant number. Second-lowest dividend payout ratio within the sample is the Construction industry (23%) followed by Education & Health (24%) and the Primary Sector (25%). The highest dividend payout ratios have Gas, Water & Electricity (69%), Post & Telecommunications (49%) and Wood, Cork & Paper (43%). All represented industries and their values can be found in the appendix in Table 5.

The results of the independent samples t-test for German firms are statistically significant (alpha value of 0.05) for all variables except for ROA (see Table 2 in the appendix). For RE/TE, RE/TA and TE/TA, it shows clearly that the higher these ratios are, the higher the payout ratio is. Firms with a low RE/TE, RE/TA and TE/TA have on average a payout ratio of about 32% whereas firms with high ratios have about 38%. A negative relationship between the sales growth rate and the dividend ratio is also confirmed by the independent samples t-test. Firms with low SGR tend to have a higher dividend ratio (38%) than firms with high SGR (32%). Also statistically significant (but contrary to prediction) is the positive relationship between Cash/TA and the dividend ratio whereas firms with low cash holdings have a dividend ratio of about 33% and firms with high cash holdings about 37%.

The linear regression analysis shows highly significant results for all variables except for Cash/TA which is like also not of the predicted sign. Statistically significant but contrary to expectations is RE/TA. The other results of the linear regression correspond significantly to the results of the independent samples t-test and are, therefore, of the predicted sign. The results for the regression analysis are shown in Table 3 in the appendix.

The analysis on the propensity to pay dividends shows highly significant results for RE/TE, RE/TA as well as ROA. On

average, dividend payers have a RE/TE of about 48% and non-payers not even half of that; 23%. The mean ratio of RE/TA for dividend-payers is 20% and 10% for non-payers (see Table 4 in the appendix). Payers have on average a return on assets of about 5% whereas non-payers have one of about 2%. The results of the other variables are not statistically significant but TE/TA shows the predicted positive sign. SGR and Cash/TA also show a positive sign which is, however, contrary to the predictions.

4.1.2 Netherlands

The summary statistics of the Dutch firms are presented in Table 1 in the appendix. They show that the mean dividend ratio is about 34% (median: 27%) and ranges from -138% to about 280%. Only nine firms did not pay dividends at all which means that out of this sample, about 97% were dividend payers in the observed period.

Throughout the years, the dividend ratios fluctuated little in the Netherlands. In 2006, it was ca. 28%, in 2007 ca. 27%, 33% in 2008, 27% in 2009, 26% in 2010, 20% in 2011 and 25% in 2012. Firms within the Wood, Cork & Paper industry have the lowest median payout ratio, ca. -3% (see Table 5 in the appendix). However, the sample includes only two observations in this industry classification so it may not be representative. A similar restriction has the Primary sector with a median payout ratio of about 28% but five observations only. Otherwise, firms within the Chemicals, Rubber, Plastics & Non-metal Products industry as well as the Construction and Other Services industries have the lowest dividend payout ratios with ca. 23%, respectively 24%. The highest payout ratio has Education & Health with 60% but only four observations. This is followed by Transport (42%) and Publishing & Printing as well as Wholesale & Retail Trade with 33% each.

Concerning the results of the independent t-test, only the results for the variable TE/TA and SGR are statistically significant (see Table 2). Dutch firms with a low TE/TA ratio have on average a payout ratio of about 29% whereas it is on average 40% for firms which score high on TE/TA. The t-test for SGR shows the same positive relationship with the dividend payout ratio with the same means. The results of all other variables (except for Cash/Total Assets) are not of the predicted sign. However, they are not statistically significant.

The regression analysis shows positive relations between all variables and the dividend ratio except for the variable RE/TE but they are not statistically significant (see Table 3 in the appendix).

The independent samples t-test that was run in order to investigate the relationships between the variables used in this paper and the Dutch firms' propensity out dividends, showed no statistically significant results but - except for ROA, SGR and Cash/TA - all variables were of the predicted sign. SGR showed in fact a difference between the means of zero. The results of this test can be found in Table 4 in the appendix.

4.2 Discussion

4.2.1 Germany

For the German sample, the two main-determinants RE/TE and RE/TA have a huge impact on the firms' decision to pay low or high cash dividends according to the independent samples t-test. This cannot be confirmed in the regression analysis for the variable RE/TA, however. The negative relationship between SGR and the dividend ratio is highly significant in this study and provides evidence for a life-cycle theory of dividends. Also highly significant is the result for the TE/TA ratio in that the dividend ratio increases when TE/TA increases. Before the conduction of this study, it was assumed that large cash holdings rather exist in order to finance upcoming investment projects than to pay out dividends to shareholders. However, according to the independent samples t-test, firms with high cash holdings have a higher dividend ratio and therefore, the implications of the variable Cash/TA for German firms stand in contrast to DeAngelo et al.'s findings for US-American firms (2006). In the regression analysis, the relation is negative but not statistically significant.

As has already been explained in section 2.3, Goergen et al. (2003) claim that German firms are willing to omit dividends in case profits decrease even on a temporary basis. In the sample of this paper, the independent samples t-test showed a highly significant positive relation between ROA and the propensity to pay dividends. In addition, the results for RE/TE and RE/TA are highly significant which corresponds to the findings of DeAngelo et al. (2006) and Denis and Osobov (2008), i.e. RE/TE and RE/TA have a large impact on the decision to pay or not to pay dividends.

Providing that the life-cycle theory of dividends for German firms does hold for the level of dividend payouts, the clientele effect, the signaling theory as well as the catering theory must be rejected to be first-order determinants to explain German dividend policy. If dividend-paying firms only took into account the amount of cash dividends their shareholders desire to receive (as the clientele effect suggests), retained earnings and growth opportunities would have no effect on the decision of how much to pay them. Rather, in case the majority of shareholders would like to receive high cash dividends, the firm would decide to pay them as much as they can and the reverse is true in case shareholders prefer low dividends. However, since this study found evidence that the earned/contributed capital mix has an impact on the decision of not only how much to pay but also on the propensity to pay, the clientele effect (as well as the catering theory) can – if at all – only be regarded as a second-order determinant to explain the dividend payout policy of the German firms that are included in this study.

According to the signaling theory, firms pay dividends in order to signal profitability. Therefore, firms which are in the growth stage and have low retained earnings are likely candidates to pay out a certain amount of dividends. Since the independent samples t-test showed that the positive relationships between RE/TE (RE/TA) as well as ROA and the propensity to pay out dividends are highly significant, the signaling theory cannot be supported in this study.

Grabowski and Mueller (1972) found that US-American firms that operate in a technology-intensive industry pay lower dividends than in industries that are not technology-driven. For the German firms in this study, a significant relation between technology-specific characteristics of certain industries and the payout ratio could not be found. For example, the Post & Telecommunications industry which is rather technology-intensive has one of the highest payout ratios. Machinery also has a moderate dividend payout ratio of about 28% even though technology plays a very important role in that industry. However, when comparing the mean ratios of RE/TE, it must be noted that those industries which have the highest RE/TE actually have the lowest payout ratio, e.g. the Primary Sector with an RE/TE of 73% but only a payout ratio of about 25%. The same can be observed in the Construction (RE/TE ≈ 66%, payout ratio ≈ 23%) and Transport industry (RE/TE ≈ 62%, payout ratio ≈ 29%). These findings imply that industries may indeed play an important role in how much a German company pays out in dividends.

4.2.2 Netherlands

In this study, no evidence could be found for Dutch firms following a life-cycle theory of dividends, respectively that RE/TE and RE/TA are main-determinants in paying out low or high cash dividends. On the other hand, since the independent samples t-test showed a positive relationship between SGR and the dividend ratio, Dutch firms might use signaling to attract investors and get access to capital. If that is the case, the positive relationship between TE/TA and the dividend ratio could be explained in that total equity is contributed instead of earned. The negative relationships between RE/TE, RE/TA and ROA with the dividend ratio (according to the independent samples t-test) further indicate that the signaling theory may hold but they are not statistically significant.

The question whether the signaling theory plays an important role in the propensity to pay out dividends for Dutch firms cannot clearly be answered. Even though the results of the independent samples t-test are not statistically significant, RE/TE, RE/TA and ROA tend to be higher for dividend-paying firms. This contradicts the signaling theory as the theory indicates firms with low retained earnings and high profitability would rather pay out dividends. The sales growth rate shows no difference between dividend payers and non-payers for Dutch firms. According to the signaling theory, SGR is expected to be high for dividend payers.

Concerning the industry characteristics of Dutch firms paying out low or high dividends, the findings by Grabowski and Mueller (1972) can partly be supported for the sample of Dutch firms in that technology-intensive industries like Chemicals, Rubber, Plastics & Non-metal Products as well as the Construction industries have the lowest dividend payout ratios (Other Services is thereby an exception). However, the reasoning might be different. Grabowski and Mueller (1972) argue that firms within technology-progressive industries pay out fewer dividends due to a wider choice of positive investment opportunities. Checking the sales growth rate for each industry, it can be observed, though, that firms within a technology-progressive industry actually have a low growth rate (Chemicals, Rubber, Plastics & Non-metal Products: 5%, Construction: 4%, Machinery, Equipment, Furniture & Recycling: 6%) and so they might in fact have fewer investment opportunities. In contrast, firms in industries with a high dividend ratio have a higher sales growth rate, e.g. Transport with 12% and Publishing & Printing with 8%. Eventually, there may be other reasons underlying the low dividend payout ratio for technology-intensive industries in the sample period, e.g. the economic situation or certain changes in industry characteristics.

4.2.3 Comparison between dividend policies in Germany and the Netherlands

German and Dutch firms both have a rather low payout ratio of about 31%, respectively 27%. While evidence could be found for a life-cycle theory of dividends for German firms regarding the dividend payout level and the firms' propensity to pay out dividends, the results for the Netherlands are not consistent with the life-cycle theory. Rather, Dutch firms seem to use signaling for their decision to pay out low or high dividends because the dividend ratios are significantly higher for those firms which have a high sales growth rate. This is supported by the fact that firms with low RE/TE, RE/TA and ROA have higher dividend ratios than those which score high on these variables. This is exactly the opposite (ROA excluded) for the German firms included in this sample so the signaling theory is considered to be a less likely explanation for German dividend policy. Even though, a tendency towards a signaling theory among the Dutch sample was found, it could not be found for the propensity to pay out dividends.

Since the results of the independent samples t-test as well as the regression analysis show significant results for a life-cycle theory of dividends for Germany, the clientele effect and catering theory can most likely be rejected. Dutch firms seem to use signaling in their decision to pay out high dividends. As a result, it is also less likely that the clientele effect plays a dominant role for the dividend policy of Dutch firms. No significant pattern could be identified concerning the propensity of firms in the Netherlands to pay dividends but a (statistically non-significant) tendency towards paying out dividends when ROA is low, could be found. This suggests that the signaling theory could also hold for the propensity to pay out dividends but since the results are not significant, the catering theory might, on the other hand, have an influence on the decision of when to pay out dividends.

Grabowski and Mueller (1972) found evidence in the US that technology-progressive firms have a low dividend ratio; no matter whether they are in the mature or growth stage. This could be confirmed for Dutch firms but since the growth rates of technology-intensive firms is rather low as well, the argument that they pay out fewer dividends due to larger investment opportunities does not hold. For Germany, the industry seems to have an influence on dividend payout as the fact that firms with high RE/TE have the lowest dividend ratios. No evidence was found for an impact of technology on the payout level.

In a nutshell, it can be said that out of this study, the dividend policy of German firms is consistent with the life-cycle theory of dividends and therefore, in line with the findings of Denis and Osobov (2008). The industry might play a role but no evidence was found that technology-progressive industries pay less dividends. Dutch firms rather tend to signal profitability with high dividends. The results on the propensity to pay dividends in the Netherlands are rather mixed but contradict the life-cycle theory and the clientele effect. In this study, Dutch firms operating in technology-intensive industries seem to pay out fewer dividends than firms that operate in industries which are not primarily technology-driven. In general, Dutch dividend policy seems to be rather flexible as put by Renneboog and Szilagyi (2006).

5. CONCLUSION

This paper has investigated the following research question: *How do dividend policies based on the life-cycle theory differentiate comparing Germany and the Netherlands?* Dividend policy refers to the amount and time pattern of earnings a company decides on to pay out in dividends to its shareholders. The life-cycle theory of dividends is built on the assumption that firms in a growth phase have high investment opportunities and low internally generated capital so they are less likely to pay out (high) dividends. Mature firms are seen as those firms which have less valuable investment opportunities but higher accumulated profits and in order to avoid a waste of free cash flows, they pay out (high) dividends to their shareholders. Since studies about the life-cycle theory outside the US are rather limited, Germany and the Netherlands are interesting countries to test the theory. Especially for the Netherlands, papers that investigate their dividend policy are rare and direct comparisons between Germany and the Netherlands have not been made, yet, and this paper fills this gap to a certain extent.

In order to test the life-cycle theory and compare the dividend policies of Germany and the Netherlands, a two samples t-test

as well as a linear regression analysis were carried out. Evidence for the life-cycle theory could be found for Germany; not only in determining the amount of dividends paid out to shareholders but also in the propensity to pay. In addition, the positive relation between the earned/contributed capital mix and dividend policy is highly significant for Germany. The signaling and catering theories as well as the clientele effect are, therefore, less likely to play an important role for German dividend policy.

For the Netherlands, the results of the quantitative analyses are not consistent with a life-cycle theory of dividends. Rather, high sales growth rates when dividend payouts are high support the signaling theory. No significant results could be obtained that also support the signaling theory for the propensity to pay out dividends. However, Gugler and Yurtoglu (2002) claim that at least for German firms, strong ownership implies that managers do not have considerable discretion in order to signal cash flows. Further research can be conducted in order to investigate such relations for Dutch firms where ownership is in fact also concentrated.

As a side-effect of this study, it was tried to identify a relationship between industries and the dividend-ratio as research showed that technology-driven industries tend to pay out fewer dividends. Some support could be found for the Netherlands whereas for Germany, technology does not seem to have an impact on the dividend payout. However, it could be observed that RE/TE is in fact low for firms within an industry with high dividend payout which contradicts the life-cycle theory of dividends (e.g. in the Primary Sector and Transportation). However, the database ORBIS only allows to categorize the industries into their major sectors given by NACE. As a result, the analysis of the industries and dividend payout may be a bit superficial in this paper. This is the reason why further research could be conducted to verify the results that were found in this study and identify underlying reasons.

Related to industry classifications is also the method by which firms were assigned dummy variables to. The median values of both samples were computed without considering the different industries. As a result, it might be the case that a firm was assigned to have a high sales growth rate but might have a low sales growth rate when compared to firms within that industry. The limitations of comparing firms from a life-cycle perspective include that the results are highly dependent on the method the life-cycle stages were determined and which variables have been taken into account. Even though for this study the variables have been chosen based on what literature suggested to be relevant in order to determine the life-cycle stages and dividend policy, there might also be other (financial) variables which are not taken into account. In addition, since a period has been chosen where two significant crises happened (the global financial crisis as well as the European sovereign-debt crisis) started, other factors might again have an impact on dividend policies in Germany and The Netherlands than simply just the life-cycle stages the firms are in.

6. ACKNOWLEDGEMENTS

First of all, I would like to thank my friends Christina-Maria Friebe, Joris Hoogerdijk, Anna Kamerlocher, Stefan Mitzkus and Christian Pötter for their hospitality and encouraging conversations throughout the last semester. Especially the third quartile would have been completely different without them and this Bachelor thesis would probably not even exist.

In addition, I am more than grateful for the mental and emotional support that my other friends Katja Heide, Jana Luckfiel, Laura Schenke, Jennifer Stahl and Iris Steen as well as my brother Matthias Trotz and his girlfriend Riana Wegner gave me. Special thanks also go to my fellow student Tobias Bohnenkamp for his endless support and for the good times we shared together.

Last but not least, I would like to thank my parents for their financial support and my supervisor Henry van Beusichem for his patience with me.

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8. APPENDIX

Table 1: Summary statistics

Included are German and Dutch industrial firms listed at the German, respectively Dutch stock exchanges from 2006 to 2012. RE/TE measures the relation of retained earnings over total (positive) equity. RE/TA was computed dividing retained earnings by total assets. TE/TA is defined by dividing total positive equity by total assets. ROA measures the profitability of a firm using net income over total assets (return on assets). The sales growth rate (SGR) is the change in sales divided by the previous year's level and Cash/TA is calculated by dividing cash and other marketable securities by total assets. The dividend ratio is defined by dividing net income by total cash dividends paid in the given period. Financial data was obtained from the database ORBIS.

Panel A	**RE/TE**	**RE/TA**	**TE/TA**	**ROA**	**SGR**	**Cash/TA**	**Dividend Ratio**
	Germany						
Mean	0.47	0.20	0.42	0.05	0.08	0.08	0.35
Median	0.52	0.18	0.40	0.05	0.07	0.06	0.31
Standard Deviation	0.32	0.16	0.16	0.04	0.13	0.09	0.31
Minimum	-0.55	-0.23	0.01	-0.08	-0.28	-0.13	-0.51
Maximum	1.36	0.62	0.91	0.17	0.42	0.34	1.27
Number of Observations	1,202	1,202	1,202	1,202	1,202	1,202	1,202

Panel B	**RE/TE**	**RE/TA**	**TE/TA**	**ROA**	**SGR**	**Cash/TA**	**Dividend Ratio**
	Netherlands						
Mean	0.45	0.18	0.43	0.05	0.06	0.08	0.34
Median	0.42	0.14	0.44	0.05	0,06	0,07	0.27
Standard Deviation	0.39	0.19	0,1647	0,.5	0.11	0,07	0.53
Minimum	-0.69	-0.33	0.05	-0.07	-0.22	5E-05	-1.38
Maximum	1.73	0.69	0.85	0.18	0,37	0.27	2.80
Number of Observations	275	275	275	275	275	275	275

Table 2: Results independent samples t-test for dividend ratios for German and Dutch firms

	Dividend Ratio (mean)	Δ[2]	p-value	Dividend Ratio (mean)	Δ	p-value
	Germany			*Netherlands*		
low RE/TE[3]	0.32	0.06	0.00	0.38	0.08	0.11
high RE/TE	0.38			0.30		
low RE/TA	0.32	0.06	0.00	0.35	0.02	0.39
high RE/TA	0.38			0.33		
low TE/TA	0.32	0.06	0.00	0.29	0.11	0.04
high TE/TA	0.38			0.40		
low ROA	0.35	0	0.32	0.35	0.01	0.42
high ROA	0.35			0.34		
low SGR	0.38	0.06	0.01	0.29	0.11	0.04
high SGR	0.32			0.40		
low Cash/TA	0.33	0.04	0.02	0.35	0.01	0.42
high Cash/TA	0.37			0.34		

Table 3: Results for the linear regression analysis

Panel A	**RE/TE[3]**	**RE/TA**	**TE/TA**	**ROA**	**SGR**	**Cash/TA**
	Germany					
Intercept	0.19	0.19	0.19	0.19	0.19	0.19
Coefficient	0.25	-0.52	0.26	1.31	-0.32	-0.04
Significance	0.00	0.00	0.01	0.00	0.00	0.72
Adjusted R^2	0.05	0.05	0.05	0.05	0.05	0.05
VIF	7.47	9.80	3.28	1.48	1.09	1.08
Number of Observations	1,202	1,202	1,202	1,202	1,202	1,202

Panel B	**RE/TE**	**RE/TA**	**TE/TA**	**ROA**	**SGR**	**Cash/TA**
	Netherlands					
Intercept	0.21	0.21	0.21	0.21	0.21	0.21
Coefficient	-0.13	0.03	0.24	0.12	0.41	0.64
Significance	0.14	0.89	0.25	0.86	0.17	0.18
Adjusted R^2	0.01	0.01	0.01	0.01	0.01	0.01
VIF	1.11	1.18	1.16	1.04	1.10	1.05
Number of Observations	275	275	275	275	275	275

[2] Δ shows the absolute differences between the mean dividend ratios of the low and high scores of each variable.
[3] The variables are defined in Table 1.

Table 4: Results independent samples t-test for German and Dutch dividend payers and non-payers

Panel A	**non-payer**	**payer**	**Δ[4]**	**p-value**
	Germany			
RE/TE[5]	0.23	0.48	0.25	0.00
RE/TA	0.10	0.20	0.10	0.00
TE/TA	0.41	0.42	0.01	0.36
ROA	0.02	0.05	0.03	0.00
SGR	0.06	0.08	0.02	0.13
Cash/TA	0.07	0.08	0.01	0.17
Number of Observations	89	1,113	-	-

Panel B	**non-payer**	**payer**	**Δ**	**p-value**
	Netherlands			
RE/TE	0.43	0.45	0.02	0.44
RE/TA	0.15	0.18	0.03	0.32
TE/TA	0.40	0.43	0.03	0.28
ROA	0.06	0.05	0.01	0.34
SGR	0.06	0.06	0	0.42
Cash/TA	0.07	0.08	0.01	0.25
Number of Observations	9	266	-	-

[4] Δ shows the absolute differences between the means of each variable for dividend payers and non-payers.
[5] The variables are defined in Table 1.

Table 5: Median Values for industries in Germany and the Netherlands

Panel A	RE/TE[6]	RE/TA	TE/TA	ROA	SGR	Cash/TA	Dividend Ratio
	Germany						
Chemicals, Rubber, Plastics[7] & Non-metallic Products (N=152)	0.06	0.23	0.42	0.07	0.07	0.05	0.33
Construction (N=24)	0.66	0.16	0.29	0.04	0.12	0.09	0.23
Education & Health (N=18)	-0.02	0	0.36	0.03	0.03	0.04	0.24
Food, Beverages & Tobacco (N=52)	0.35	0.15	0.35	0.03	0.05	0.01	0.32
Gas, Water & Electricity (N=42)	0.66	0.18	0.35	0.04	0.07	0.04	0.69
Hotels & Restaurants (N=5)	0.42	0.13	0.31	0.03	0.03	0.02	0
Machinery, Equipment, Furniture & Recycling (N=303)	0.56	0.21	0.41	0.05	0.08	0.07	0.28
Metals & Metal Products (N=46)	0.63	0.24	0.39	0.05	0.07	0.07	0.27
Other Services (N=234)	0.36	0.12	0.38	0.04	0.09	0.05	0.32
Post & Telecommunications (N=27)	0.43	0.13	0.38	0.05	0.05	0.07	0.49
Primary Sector (N=11)	0.73	0.43	0.53	0.06	0.13	0.02	0.25
Publishing & Printing (N=67)	0.45	0.18	0.48	0.07	0.09	0.08	0.31
Textiles, Wearing Apparel & Leather (N=32)	0.65	0.33	0.45	0.06	0.09	0.05	0.35
Transport (N=57)	0.62	0.20	0.34	0.04	0.08	0.09	0.29
Wholesale & Retail Trade (N=96)	0.53	0.18	0.42	0.04	0.04	0.06	0.34
Wood, Cork & Paper (N=36)	0.47	0.29	0.58	0.04	0.05	0.09	0.43

[6] The variables are defined in Table 1.

[7] The industries are classified by the Statistical Classification of Economic Activities in the European Community (NACE).

Panel B	**RE/TE**	**RE/TA**	**TE/TA**	**ROA**	**SGR**	**Cash/TA**	**Dividend Ratio**
	Netherlands						
Chemicals, Rubber, Plastics & non-Metallic Products (N=21)	0.93	0.14	0.48	0.04	0.05	0.04	0.24
Construction (N=31)	0.58	0.16	0.40	0.04	0.04	0.05	0.23
Education & Health (N=4)	0.20	0.04	0.26	0.03	0	0.05	0.60
Food, Beverages & Tobacco (N=25)	0.73	0.10	0.48	0.04	0.10	0.08	0.29
Machinery, Equipment, Furniture & Recycling (N=42)	0.25	0.21	0.46	0.07	0.06	0.06	0.26
Metals & Metal Products (N=6)	0.14	0.07	0.34	0.06	0	0.05	0.27
Other Services (N=59)	0.21	0.13	0.45	0.05	0.04	0.07	0.24
Post & Telecommunications (N=6)	0.35	0.15	0.40	0.06	-0.03	0.10	0.27
Primary Sector (N=5)	0.66	0.15	0.29	0.05	0.03	0.06	0.28
Publishing & Printing (N=30)	0.78	0.22	0.49	0.07	0.08	0.05	0.33
Textiles, Wearing Apparel & Leather (N=5)	0.84	0.11	0.37	0.06	0.24	0.05	0.28
Transport (N=15)	0.23	0.11	0.39	0.09	0.12	0.13	0.42
Wholesale & Retail Trade (N=24)	0.17	0.11	0.43	0.07	0.07	0.09	0.33
Wood, Cork & Paper (N=2)	0.93	0.23	0.31	0.04	-0.01	0.06	-0.03