The relationship between Corporate Social Responsibility and capital structure and its importance over time

ABSTRACT

This thesis aims to study the relationship between Corporate Social Responsibility (CSR) and capital structure and the importance of CSR over time. CSR is defined as company performance regarding social, environmental and corporate governance practises. A fixed effects estimation technique is used in the main analysis, followed by some robustness checks of which the GMM estimation technique is one. Using ASSET4 panel data from the Thomson Reuters Eikon database, only little evidence is found in support of this relationship. Only the GMM estimation technique shows a negative relationship between the corporate governance pillar and capital structure. Surprisingly, although corporate governance is not related to the capital structure in the main analysis, the strength of the corporate governance-capital structure relationship has increased over the years.

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Date: 20-7-2018

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1 Introduction

One of the most studied concepts in corporate finance is the capital structure of firms. The Modigliani-Miller theorem, trade-off theories and pecking order theory all seek to explain capital structure decisions. A field of study that only recently flourished is Corporate Social Responsibility (CSR). Many research that combines CSR with economics has been focussed on the financial consequences of CSR activities. For example, the effect of CSR on the cost of debt (Goss & Roberts, 2012; Oikonomou, Brooks & Pavelin, 2014; Ge & Liu, 2015; Bauer & Hann, 2010; La Rose, Liberatore, Mazzi & Terzanic, 2017) and on the cost of equity (Dhaliwal, Li, Tsang & Yang, 2011; El Ghoul, Guedhami, Kwok & Mishra, 2011; Xu, Liu & Huang, 2015) has been examined extensively. These studies show a negative relationship between CSR performance and cost of debt and equity. The rationale is that engagement in CSR activities decreases investor's perceived riskiness of the firm (El Ghoul, Guedhami, Kwok & Mishra, 2001). An additional force driving this relationship is the reduction of asymmetric information of firms with high CSR performance (Cho, Lee & Pfeiffer, 2013; El Ghoul, Guedhami, Kwok & Mishra, 2011). Another topic that has been studied extensively is the effect of CSR on the financial performance of firms. However, the results of these studies are mixed. Some researchers argue that CSR increases brand image, reputation and transparency, decreases costs, enhances stakeholder relationships and reduces risk and hence provide support for a positive relationship (Tsoutsoura, 2004; Waddock & Graves, 1997). Other studies report a negative (Wright & Ferris, 1997) or neutral (McWilliams & Siegel, 2000) relationship. While financial consequences of CSR activities, such as cost of capital and financial performance, have been studied extensively, there is only little research on the effect of CSR performance on firm's financial policies. Financial policies refer to the main direction of action of the firm's financial activities, and in taking decisions on financial policies, the interest of all stakeholders is considered very carefully. Corporate Social Responsibility, with its social, environmental and corporate governance dimensions, reflects a large number of stakeholders. The studies that address the relationship between CSR and financial policies only focus on (a sub-part of) a single dimension of CSR performance. Bae, Kang & Wang (2011) and Verwijmeren & Derwall (2010) only focus on a sub-part of the social pillar, the employment treatment index score and employee wellbeing respectively. Girerd-Potin, Jimenez-Garces & Louvet (2011) and Pijourlet (2013) focus only on the social dimension of CSR in their analysis. Finally, Gruszczynski (2006), Jiraporn & Gleason (2011), Jiraporn, Kim, Kim &

Kitsabunnarat (2012) and Nadarajah, Ali, Liu & Huang (2016) study the relationship between corporate governance and capital structure. This study seeks to extend the research of CSR performance on firm's capital structure by incorporating all three dimensions of CSR performance. Hence, the research question that follows is:

'What is the relationship between CSR performance and firm's capital structure?'

It is vital for firms to know how their capital structures are determined. When managers decide to engage in (more) CSR activities, they should know whether these activities influence different aspects of the firm. To effectively manage their organisations, managers should incorporate this knowledge in their financing decisions. From a societal perspective, this study is relevant because CSR is a concept that has high societal value. Society benefits from firms engaging in CSR practices, because of the social and environmental nature of CSR.

This thesis uses a fixed effects model to capture the effect of CSR performance on the capital structure. The ASSET4 dataset from Thomson Reuters Eikon is used which divides CSR performance into multiple dimensions. The social, environmental and governance performance dimensions are used to measure the effect of CSR. In contrast to earlier research, no significant negative effect is found between the social dimension of CSR and capital structure. The environmental pillar has not extensively been studied before and shows an insignificant negative relationship with leverage too. The corporate governance pillar is insignificant in most models except the GMM estimation, where it shows a negative relationship with leverage. Since the importance of and attention to CSR related issues have increased over the years, this study examines whether the effect of CSR on capital structure also has increased over the years. Some evidence is found in favour of this argument; while the effect of the environmental and social dimension remains unchanged, the effect of corporate governance on the capital structure has become stronger.

The remainder of this thesis is structured as follows: the next section provides an overview of the related literature on capital structure, CSR and the combinations of these concepts. Section 3 elaborates on the research method and data after which, in section 4, the results and some robustness tests will be presented. Section 5 concludes and discusses the findings, implications, limitations and possible future research.

2 Literature overview

2.1 Theories on capital structure

Capital structure decisions with regard to a company's composition of debt and equity, have been examined extensively in the economic literature. Modigliani and Miller (1958) were the first to demonstrate the trade-off between debt and equity in these decisions. According to them, the market value of a firm is only dependent on the income stream generated by that firm's assets. If this claim holds, then the capital structure does not influence the market value of a firm and consequently does not influence the cost of capital. This reasoning leads to their famous proposition: "the average cost of capital to any firm is completely independent of its capital structure" (Modigliani & Miller, 1958). However, their theorem is based on strong assumptions of a perfect market environment, which do not hold in practice (Titman, 2002).

When one relaxes the assumptions of the Modigliani-Miller theorem, the possibility of an optimal capital structure arises. A related set of theories that incorporate the notion of an optimal capital structure are known as trade-off theories. Trade-off theories focus on the cost and benefits of debt financing (Frank & Goyal, 2007). In static trade-off theory, firms gradually move towards the selected capital structure. These static models have faced severe criticism, which is partly resolved by dynamic trade-off models. Dynamic trade-off theory represents the capital structure as an interval. The financing mix is revised whenever the interval boundaries are crossed (Lemmon & Zender, 2010). Though the dynamic models have more explanatory power in describing capital structures, these models still face some severe criticism. The first criticism by Fama & French (2002) concerns their finding of debt ratios adjusting very slowly to their (interval) targets. Since it takes a very long time to return to the optimal capital structure, the question remains whether the interval is actually optimal because it is not reached most of the time. Secondly, Welch (2004) found that stock price shocks affect capital structures for a significant period of time. The article concludes with the notion that capital structures are primarily determined by stock price shocks, and that the motives for issuing activities remains a mystery. The last criticism refers to the unobservability of the optimal capital structure (Frank & Goyal, 2007). The optimal capital structure interval is not straightforward, the question remains how the optimal interval can be determined.

In response to these shortcomings, Myers (1984) developed the pecking order theory based on earlier work of Myers and Majluf (1984), which was

later further developed by Lucas & McDonald (1990). Pecking order theory rejects the notion of an optimal capital structure and instead focusses on asymmetric information problems (Shyam-Sunder & Myers, 1999). It is argued that managers know more about the firm's riskiness and the firm's actual value than less informed outside investors. Hence, internal financing is preferred since it does not exhibit these asymmetric information costs. When internal resources are fully exhausted, external financing, the issuance of debt and equity, is the next best option. Consequently, the use of debt is preferred over equity since debt is less risky and hence exhibits lower asymmetric information costs. If the company is not able to attract more debt, the least attractive financing option, equity financing, is left (Lemmon & Zender, 2010). The pecking-order theory rejects the notion of an optimal capital structure but does incorporate the notion of optimal financing decision. Whenever the company is in need of financing, there is an optimal financing decision which mainly depends on net cash flows in determining the availability of funds (Tong & Green, 2005). While some empirical findings are in favour of the theory (Lemmon & Zender, 2010; Shyam-Sunder & Myers, 1999), others do not support the pecking order theory (Fama & French, 2002; Frank & Goyal, 2003; Leary & Roberts, 2010).

2.2 Corporate Social Responsibility

Firms and society at large keep an interest not only in the financial performance of firms but also in their nonfinancial performance. Nonfinancial indicators, such as customer loyalty and employee satisfaction are regarded as additional instruments that also affect profitability (Ittner & Larcker, 2003). However, nonfinancial performance is broader than only these social indicators. The most common terms to address these comprehensive nonfinancial indicators are Corporate Social Responsibility (CSR), Corporate Social Performance (CSP) and Environmental, Social and Governance (ESG) issues (Gillan, Hartzell, Koch, & Starks, 2010). Other than financial performance indicators, the information on these non-financial indicators serves to provide better insight into the firm's overall performance and helps investors to better asses risks and opportunities (Bassen & Kovacs, 2008). In this thesis, these non-financial indicators are referred to as Corporate Social Responsibility (CSR) performance. However, in academic literature, there is no consensus on a precise definition of CSR (Dahlsrud, 2008). There are many definitions that are often biased towards specific interests of study (van Marrewijk, 2003). Therefore, it is crucial to define and explain the operationalisation of the concept clearly. CSR can in broad terms be defined

as follows: "In general, corporate sustainability and, CSR refer to company activities – voluntary by definition – demonstrating the inclusion of social and environmental concerns in business operations and in interactions with stakeholders" (van Marrewijk, 2003). In this definition, both the social and environmental dimensions are explicitly included in the concept. A third dimension is less explicitly included and, as stated in the definition, concerns the firm's interactions with stakeholders and can be interpreted as corporate governance performance. Hence, in this thesis, the definition of CSR performance refers to these social, environmental and corporate governance performance dimensions. Social performance refers to issues such as the firm's health and safety, community, diversity, human rights, product responsibility, training and development and employment quality. Environmental performance refers to issues such as the firm's product innovation benefiting the environment, emission reduction and resource reduction (Luo, Wang, Raithel, & Zheng, 2015). Corporate governance performance refers to the firm's corporate conduct and board effectiveness. Along with the development of global markets, investors demand higher standards of performance, responsibility and conduct (Kocmanová & Dočekalová, 2013).

2.3 CSR and the capital structure

The studies that address the CSR-capital structure relationship only incorporate (a sub-part of) a single dimension of CSR. Verwijmeren & Derwall (2010) use a measure of employee wellbeing and seek to capture its effect on firm's leverage. The research finds that higher employee wellbeing leads to lower costs of equity and consequently to firms issuing more equity compared to firms with lower employee wellbeing scores. The rationale is that debt increases the chance of bankruptcy, that bankruptcy is costly for employees and that firms that care about social responsibility are thus likely to reduce the chance of bankruptcy (Verwijmeren & Derwall, 2010). Bae, Kang & Wang (2011) use the employee treatment index score to capture the effect of social responsibility on capital structure and explain this relationship based on three arguments. The model of Maksimovic and Titman (1991) is the primary focus of the paper, and they hypothesise that stakeholders are reluctant to engage into a contract with highly leveraged firms because there is a possibility that the firm does not honour its contracts in case of financial difficulties. The second argument relates to agency costs and is based on the analysis of Myers (1997). The argument is as follows: if highly leveraged firms have incentives not to engage in valuable investment opportunities, positive net present value investments in human capital will not be

employed. This also indicates a negative relationship; however, the rationale and the causal direction of the effect are different. The last argument is based on Jensen (1986) who expects firms with high free cash flows to be more likely to employ the necessary resources to invest in social responsibility activities. If these investments do not create value for shareholders, and debt is a disciplinary mechanism that prevents firms from wasting cash, high leverage will control overinvestment in CSR. Thus, while this argument has a different rationale, it also predicts a negative relationship but the direction of the relationship proceeds from capital structure to CSR. Bae, Kang, & Wang (2011) find support for the first argument of Maksimovic and Titman (1991) and consequently report that high employee treatment scores are associated with lower leverage. Pijourlet (2013) defines CSR as socially responsible firms and finds that socially responsible firms are less leveraged and prefer equity over debt financing in attracting new capital. The study also addresses the environmental performance of firms, but it is not the focus of the paper because it is found not to have any effect on leverage. The last study that investigates the CSR-capital structure relationship is by Girerd-Potin, Jimenez-Garces, & Louvet (2011) and it takes social ratings of the Arese and Vigeo rating agencies as the independent variable. The results are in line with the abovementioned studies and show a negative relationship between social rating and leverage. These studies only focus on (a sub-part of) the social aspect of CSR.

Other studies only incorporate the corporate governance dimension of CSR. Jiraporn and Gleason (2007) study the relationship between shareholder rights and capital structure for US companies. The relationship is theoretically motivated by agency theory, which states that agency conflicts reduce the use of equity financing. Jiraporn and Glearson (2007) argue that good corporate governance reduces agency conflicts and consequently reduces leverage. To proxy shareholder rights, the governance index from the Investor Responsibility Research Center (IRRC) is obtained, which publishes detailed information on corporate governance provisions for individual firms. The authors find that there is an inverse relationship between corporate governance and leverage. A similar study by Jiraporn, Kim, Kim & Kitsabunnarat (2012) reports the finding that US firms with weak corporate governance are significantly more leveraged than firms with good corporate governance. Additional analysis points out that corporate governance and leverage are not merely related, but that good corporate governance likely brings about lower leverage. The proxy that the authors use for corporate governance is captured by data on the governance standards by the Institu-

tional Shareholder Services (ISS). Although not the focus of the article, the same negative relationship is found in the article by Gruszczynski (2006), when using a dataset of Polish companies. Finally, the study by Nadarajah, Ali, Liu, & Huang (2016) on the effect of corporate governance quality on leverage finds a similar negative relationship for Australian firms. A measure for corporate governance quality is constructed using Horwarth ratings for six categories: audit committee, board structure, codes of conduct, external auditor independence, nomination committee and remuneration committee (Nadarajah, Ali, Liu, & Huang, 2016).

2.4 Hypothesis development

2.4.1 CSR and the capital structure

This thesis incorporates the entire social dimension as well as the environmental and corporate governance performance dimensions. The relationship between CSR and capital structure is therefore not necessarily in line with these previous studies. Two rationales are presented that predict the relationship between CSR and capital structure.

The risk mitigation view of CSR is the idea that investing in social, environmental and corporate governance practices reduces the risk of the firm. Several studies investigated this relationship; Jo & Na (2012), Lee & Faf (2009) and Boutin-Dufresne & Savaria (2004) find a negative relationship between CSR and risk. Possible reasons for this relationship are improved risk management, better access to financial markets, insurance-like protections, improved information transparency and providing market appeal to customers (Jo & Na, 2012). As illustrated in the CAPM model, if firms are less risky, their cost of equity will decrease (Hillier, Clacher, Ross, Westerfield, & Jordan, 2014). The model of Heinkel, Kraus & Zechner (2001) assumes two types of investors: neutral investors that ignore ethical considerations and green investors who do take into account ethical considerations and refuse to invest in non-ethical firms. The model specifies three types of firms: green firms, polluting firms and reformed firms. The latter are initially polluting firms, which, after reformation, have obtained acceptable standards. Polluting firms will have a smaller investor base, because the green investors only invest in green and reformed firms. This leads to lower risk sharing for polluting firms, and thus to lower demand and consequently to a lower share price and higher cost of equity. Hence, the model shows that due to ethical investing, polluting firms are more leveraged than their counterparts (Heinkel, Kraus, & Zechner, 2001). This body of literature leads

to the increased investor base hypothesis: CSR activities lead to a large investor base, which reduces risk and costs of equity and increases share prices which leaves equity as a more attractive financing option. The increased investor base hypothesis thus hypothesises a negative relationship between CSR and the capital structure.

Another view suggests the opposite; that CSR increases the portion of debt. The reputation view is based on agency costs and is closely linked to the argument of Myers (1977) and Jensen (1986). According to this view, managers overinvest in CSR at the expense of shareholders. Managers do this because the benefits of CSR investment will come to them in the form of reputation, while shareholders only bear the costs (Rubin, 2005). Hence, CSR increases the cost of equity, and high CSR performance firms are more leveraged. The second way in which this relationship might manifest itself is through reduced cost of bankruptcy. Jiraporn, Jiraporn, Boeprasert & Chang (2014) find that an increase in one standard deviation of CSR increases firm's credit ratings by 4.5%. Higher credit ratings reduce the cost of bankruptcy, which in turn makes debt a more attractive financing option. This leads to the reputation hypothesis: CSR activities lead to higher cost of equity and lower cost of debt, which leaves debt financing as a more attractive financing option. The reputation hypothesis thus suggests a positive relationship between CSR and the capital structure.

The increased investor base hypothesis is more appealing since earlier research that has been conducted has confirmed a negative relationship between (sub-parts of) the social and governance dimensions of CSR and firm's leverage. This leads to the following hypothesis:

H1: Firms that engage more in social, environmental and corporate governance practices are less leveraged.

2.4.2 CSR in a historical perspective

While CSR is often perceived as a concept of recent years, the origin of CSR lies in the 1950's. The phenomenon of CSR was a response to the institutional deficits, which failed to provide social infrastructure. In that time, CSR mainly took the form of charitable giving (Kudłak, Szőcs, Krumay, & Martinuzzi, 2018). Back then, the concept was not paid much attention to by businessman, because it was perceived as expensive and an unnecessary form of spending. While expectations regarding ethical practices of corporations grew, it became evident that CSR is indeed in the best interest of the firm in the long run. As social consciousness advanced, business behaviour

was examined more closely, and attention to CSR practices grew. Another event that increased the importance of CSR was the introduction of social regulations by the government. In the 1980's, Ronald Reagon was elected as president of the US and the CSR movement gained increased attention because Reagon called upon companies to address social problems. With globalisation, strategic reconciliation and industrialisation in the 1990's, the concept of CSR also gained attention outside of America and the environment became an additional dimension of concern. So far CSR had mainly been concerned with the social dimension. In the 2000's the dimension of corporate governance gained attention because of multiple scandals during that period (Caroll, 2015).

CSR practices have become even more important in recent years (Schrempf-Stirling, Palazzo, & Philips, 2016). The level of the legitimacy of businesses has fallen drastically over the years and has reached an all-time low (Crane, Palazzo, Spence, & Matten, 2014). This growing scepticism about corporate actions is driven by the power balance between the government and firms (Scherer & Palazzo, 2007). Firms increasingly operate on a global scale, while governmental regulation lacks and for a large part remains nationally bound (Matten & Crane, 2005). Corporations have recently been the centre of attention when it comes down to social, environmental and governance disasters (Philips, 2010). Examples are the mistreatment of child labourers by Walmart in 2005 and violent and illegal plucking methods of Moncler in 2014 (Florio & Sproviero, 2017). However, companies have also been acknowledged as potential promoters and protectors of the environment, human rights and legitimate corporate governance practices (Philips, 2010). Accordingly, expectations of corporations to act responsibly on these matters have increased (Palazzo & Scherer, 2006). Several studies demonstrate that CSR increases trust in the corporation (Pivato, Misani & Tencati, 2008; Martínez & Del Bosque, 2013; Tian, Wang & Yang, 2011) and this belief is also shared by managers who indicate that CSR investments have been used to restore the trust of stakeholders after a particular event (PricewaterhouseCoopers, 2013; PricewaterhouseCoopers, 2014). Thus, the increased scepticism of stakeholders with respect to corporations likely has led to increased investments in CSR to regain trust. Hence, CSR has played a more critical role, and its importance is expected to have increased over the years because of increased worldwide attention, which leads to the following hypothesis:

H2: The relationship between CSR and capital structure has become stronger over the years.

3 Method

3.1 Sample

The dataset consists of all firms in the Thomson Reuters Eikon database for which data on CSR is available for the period 2002-2016. The timeframe starts in 2002 because CSR data recordings by the Thomson Reuters database started in this year; this data is not available for prior years. The period ends at 2016 because, at the time of writing, it is the latest year for which data is available. Specifically, the CSR data source covers roughly 7,000 firms that are listed worldwide. Financial firms and firms that face strict regulations are removed from the analysis because these firms either face strict capital requirements, or their operations differ substantially from firms in other industries, which might also affect the capital structure decision. Consequently, firms with Standard Industrial Classification (SIC) codes ranging from 4900-4999 and 6000-6999 are removed from the dataset. Furthermore, there are many missing values observed in the dataset. To provide a more meaningful interpretation of the dynamics over time, it is desirable to have information on consecutive years. Hence, firms that do not contain information on five consecutive years for the dependent variable, as well as all independent variables, are excluded from the analysis. The result is a final panel dataset of 3,596 firms listed in 47 countries and 18,508 firm-year observations.

3.2 Measures

3.2.1 Dependent variable

The dependent variable in the analysis is the capital structure which is represented as leverage. As Jong, Kabir & Nguyen (2008), Rajan & Zingales (2015) and Verwijmeren & Derwall (2010) point out, a distinction can be made between book leverage and market leverage. Following Pijourlet (2013), total assets at their book value are considered not to be able to appropriately investigate the link between CSR and leverage because book value does not reflect the trade-off between debt and equity. Consequently, the market leverage ratio is the dependent variable in the analysis and is calculated by dividing total debt by the share price times common shares outstanding. The natural logarithm of the market leverage ratio is computed to obtain a normally distributed dependent variable. The data to compute the market leverage ratio is retrieved from the Thomson Reuters Eikon database.

3.2.2 Independent variables

Corporate Social Responsibility is defined as the social, environmental and corporate governance performance of companies. All three dimensions of CSR are incorporated as separate independent variables in order to disentangle their individual effects. Data on the social, environmental and governance performance is collected via ASSET4 data on Thomson Reuters Eikon. ASSET4 data provides information on the social, economic, environmental and corporate governance performance of firms and has global coverage. ASSET4 provides scores on the individual dimensions, which are based on many metrics, and an equal-weighted rating over all dimensions with scores ranging between 0 and 100. A higher score represents a higher CSR performance.

3.2.3 Controls

Numerous variables determine firm's capital structures. Control variables that are frequently encountered in the literature on capital structure are included in the model. A detailed overview of the control variables and relevant literature is presented in table A2 in the Appendix. The control variables that are incorporated are firm size, profitability, growth opportunities, SGA expenses, financial slack, dividend payments, asset structure, liquidity and non-debt tax shields. The following section elaborates on the choice and computation of the controls. All data is retrieved from the Thomsom Reuters Eikon database.

Firm size is an inverse proxy for costs of bankruptcy and asset volatility (Frank & Goyal, 2009; Rajan & Zingales, 1995). As demonstrated by multiple studies (Deesomsak, Paudyal & Pescetto, 2004; Frank & Goyal, 2009; Hovakimian, Opler & Titman, 2001; Jong, Kabir & Nguyen, 2008; Rajan & Zingales, 1995), the expected relationship between firm size and leverage is positive. Firm size is measured as the natural logarithm of total assets.

Although the direction of the effect on capital structure is uncertain, profitability might also affect the capital structure. More profitable firms have higher debt capacity and thus use more debt financing. However, these firms might increase retained earnings which decreases the use of debt (Hovakimian, Opler & Titman, 2001; Lipson & Mortal, 2009). A positive direction could be explained by more severe cash flow problems that arise in more profitable firms. In an attempt to discipline managers, debt could be used to mitigate these problems (Jensen, 1986). Since an overwhelming number of studies report a negative relationship (Baskin, 1989; Chen, 2004; Chitten-

den, Hall & Hutchinson, 1996; Friend & Lang, 1988; Huyang & Song, 2006; Kester, 1986; Lipson & Mortal, 2009; Titman & Wessels, 1988), the relationship between capital structure and profitability is expected to be negative as well. Following most studies, profitability is measured as the return on assets, which is operationalised as EBITDA divided by total assets times 100.

Growth opportunities are expected to increase costs of financial distress and to lower free cash flow problems (Jensen, 1986). Thus, firms with higher growth opportunities are expected to increase the portion of debt. Therefore, the expected sign of the relationship is positive. While some studies report a negative relationship (Chung, 1993; Deesomsak, Paudyal & Pescetto, 2004; Huang & Song, 2006), most evidence points toward a positive relationship (Chen, 2004; 2009; Ozkan, 2001; Titman & Wessels, 1988). Growth opportunities is often measured by the market-to-book ratio (Song, 2005). The market-to-book ratio is calculated as the market value of the firm divided by common equity.

Selling, general and administrative (SGA) expenses represent both agency costs and product specialisation (Bae, Kang, & Wang, 2011). A negative relationship between SGA expenses and capital structure is expected.

Firms with substantial financial slack are expected to require less debt (Gaud, Hoesli & Bender, 2007; Verwijmeren & Derwall, 2010). Following Pijouerlet (2013), financial slack is measured as cash and cash equivalents divided by total assets. As in Bae Kang & Wang (2011) and Pijourlet (2013), firms that pay many dividends are presumed to be less financially constrained. Thus, the expectation is that there is a negative relationship between dividend payments and leverage.

Tangibility, measured as the ratio of tangible assets to total assets, is often used as a measure of asset structure (Chen, 2004; Chung, 1993; Long & Malitz, 1985; Walsh & Ryan, 1997). According to agency theory, firms are assumed to conflict with shareholders, which creates incentives for shareholders not to invest in an optimal way. This leads to lenders requiring tangible assets as collateral in order to protect themselves. A positive relationship between asset structure and capital structure is predicted since it is not as difficult to write contracts for firms with high levels of tangible assets; thus these firms will be higher leveraged (Song, 2005; Walsh & Ryan, 1997).

Liquidity refers to the ease with which a company can meet financial obligations and is defined as current assets divided by current liabilities. According to the pecking order theory, highly liquid firms will borrow less because they will first use internal financing sources. Besides, liquidity can increase the cost of debt because managers might manipulate liquid assets

against the interest of debt holders, in favour of shareholders (Prowse, 1990). In favour of this rationale, some studies report a negative effect (Deesomsak, Paudyak & Pescetto, 2004; Jong, Kabir & Nguyen, 2008; Ozkan, 2001).

To reduce corporate tax, firms can use non-debt tax shields. These tax shields reduce the potential tax benefit of debt financing and hence are expected to be negatively related to the leverage ratio. Following (Bradley, Jerrell & Kim, 1984; Deesomsak, Paudyal & Pescetto, 2004; Huang & song, 2006; Ozkan, 2001) non-debt tax shields is calculated by dividing depreciation by total assets.

3.3 Descriptive statistics

In table 1, the summary statistics of the dependent, independent and control variables are presented. Leverage ratios in this sample have an average (mean) of 2.2355, and a standard deviation of 2.17, which is broadly consistent with the leverage ratios reported in similar studies[1]. The scores for the social, environmental and corporate governance pillars are relatively close to each other. The corporate governance dimension has a substantially lower average than the other two ratings. Also, the lowest corporate governance score is lower than the lowest scores of the other two pillars suggesting that overall, firms score worse on the corporate governance pillar.

Table 1: Summary statistics

Variable	Observations	Mean	SD	min	max
Market leverage	45,438	-1.55	2.17	-15.46	8.01
Social	35,896	54.74	30.64	3.44	99
Environmental	35,896	54.26	31.77	8.27	97.5
Governance	35,896	51.95	30.91	1.09	97.91
Size	48,660	16.93	2.81	0	27.66
ROA	47,456	5.96	29.39	-978.62	5,771
SGA expenses/sales	37,914	0.66	59.67	-11.85	11,531
MTB ratio	46,353	0.003	0.02	-2.25	1.96
Financial slack	48,622	0.12	0.13	0	2.46
Dividend dummy	50,445	0.82	0.38	0	1
Asset structure	38,013	1.07	0.43	0.005	28.54
Liquidity	39,330	1.94	18.54	0	3,592
Non-debt tax shields	34,185	0.04	0.74	0	137.24

[1]Transformation of the log leverage ratio requires a correction because the transformed estimator consistently underestimates the mean. After applying the bias correction, the mean leverage ratio is 2.2355 ($e^{-1.55+0.5*(2.17)^2} = 2.2355$).

To inspect whether the data might have a multicollinearity problem, a correlation matrix is presented in table A1 in the Appendix. There is a high correlation between the environmental and governance indicators, this might be problematic and will be paid attention to later in the analysis. All the other correlations have such a low value that it is reasonable to assume that multicollinearity will not be a problem.

3.4 Method

As in Girerd-Potin Jimenez-Garces & Louvet (2011) and Pijourlet (2013), the model will be estimated using fixed effects, which is a conventional method to analyse panel data. The fixed effects model creates a dummy for each firm, which already controls for industry and country-specific effects. A control for year-specific effects is included in the model. Another common method to analyse panel data is with a random effects model. However, the results of the Hausman test rejects the use of the random effects model in favour of the fixed effects model. To address the second hypothesis, the same model will be estimated with the addition of three interaction terms. The interaction terms capture the change in time and the social, environmental and governance indicators respectively. The variables are centered in order to provide interpretative meaning to the coefficients.

4 Results

4.1 Main analysis

The results of the fixed effects model are depicted in table 2. Since both autocorrelation and heteroscedasticity are detected in the data, the option robust is added to correct for this. The results for the social, environmental and corporate governance dimensions indicate an insignificant negative relationship. There is no support for either the increased investor base hypothesis or the reputation hypothesis. The results do not support hypothesis 1.

Although there is no significant effect, the strength of the effect might still have increased over time. For example, it might be that increased importance has led to a significant effect in the latest year(s), which is overshadowed by a long time-frame of insignificance. To test whether the strength of this relationship has increased over the years, an interaction term is added which is the standardised value of change over time multiplied by the standardised values of social, environmental and governance respectively. The results are

Table 2: Dependent variable: market leverage ratio

	Model 1	Model 2	Model 3
Social	-0.000176	-0.000168	-0.0000690
	(0.0009)	(0.0009)	(0.0009)
Environmental	-0.0000112	-0.0000303	-0.0000901
	(0.0009)	(0.0009)	(0.0009)
Governance	-0.00598	-0.000656	-0.000626
	(0.0009)	(0.0009)	(0.0009)
Size	0.516***	0.510***	0.517***
	(0.0493)	(0.0493)	(0.0491)
ROA	-0.0207***	-0.0208***	-0.0208***
	(0.0023)	(0.0023)	(0.0023)
MTB ratio	-0.415*	-0.426*	-0.422*
	(0.2030)	(0.2029)	(0.2034)
SGA expenses/sales	0.00225	0.00214	0.00220
	(0.0045)	(0.0045)	(0.0045)
Financial slack	-1.073***	-1.049***	-1.069**
	(0.2839)	(0.2838)	(0.2832)
Dividend dummy	-0.194***	-0.204***	-0.202***
	(0.0441)	(0.0439)	(0.0439)
Asset structure	0.374***	0.360***	0.369***
	(0.0899)	(0.0900)	(0.0899)
Liquidity	-0.145***	-0.145***	-0.145***
	(0.0244)	(0.0244)	(0.0243)
Non-debt tax shields	-0.895	-0.999	-0.923
	(1.0439)	(2.0439)	(1.0418)
Social int.		0.0233	
		(0.0287)	
Environmental int.		-0.0414	
		(0.0247)	
Governance int.		0.0402*	0.0393*
		(0.0194)	(0.0189)
Year dummies	yes	yes	yes
Observations	18,508	18,508	18,508

* Model (1) reports the results of the fixed effects analysis. Model (2) reports the results of the fixed effects analysis including interaction terms for social, environmental and governance with time. Model (3) reports the results of the re-estimated model including the significant interaction terms. Social int. is the interaction term of the standardized value of social with time. Environmental int. is the interaction term of the standardized value of environmental with time. Governance int. is the interaction term of the standardized value of governance with time. Robust standard errors are given in parenthesis.
* p<0.05, ** p<0.01, *** p<0.001

presented in table 2. The results of the time effect are mixed. The social and environmental pillar show an insignificant negative interaction between time and the value of social and environmental respectively. For governance, the time interaction coefficient is positive and significant at the 5% level. This implies that the relationship between governance and leverage has become stronger over time. The results partly support H2, which hypothesised increasing importance over time. The inclusion of the interaction terms has not changed the results of the independent variables. Since the significance of the interaction term shows that there is a significant increasing effect, this interaction term should be included in the model to prevent omitted variables bias. Hence, the first model is re-estimated including the corporate governance interaction term and is depicted in the third row in table 2. The inclusion of the significant interaction terms does not change the results.

4.2 Robustness check

4.2.1 Independent analysis

As can be seen from table A1 in the Appendix, the independent variables are relatively highly correlated with each other. This implies that the effects of social, environmental and corporate governance cannot be estimated independently and this renders estimates of the independent variables to be imprecise. Hence, the independent variables are estimated independently to address this concern. The results excluding control variables are depicted in table 3, the results including control variable can be found in the Appendix table A3. The results remain robust when the independent variables are regressed independently; thus the conclusion is that multicollinearity does not bias the results.

4.2.2 Dependent variables dichotomous dummy

For an additional test of robustness, the independent variables (social, environmental and governance) are constructed differently. Following Girerd-Potin, Jimenez-Garces & Louvet (2011) the independent variables are divided into categories. The independent variables will be placed into the category 'high' when observations are higher than the median and placed in the category 'low' for values below the median. By doing this, a dummy is created which is 0 if the observation for the social, environmental and corporate governance pillars is placed into the category low and which is 1 if the observation is placed into the category high. The results excluding the control variables are presented in table 4. In the Appendix table A4

Table 3: Dependent variable: market leverage ratio

	(1) Social	(2) Environmnetal	(3) Governance
Social	-0.000264		
	(0.0009)		
Environmental		-0.0000251	
		(0.0008)	
Governance			-0.000670
			(0.0009)
Governance Int.	0.0391*	0.0393*	0.0393*
	(0.0189)	(0.0188)	(0.0188)
Year dummies	yes	yes	yes
Observations	18,508	18,508	18,508

* (1) Social estimates the fixed effects model with only the social dimension as independent variable. (2) Environmental (2) estimates the fixed effects model with only the environmental dimension as independent variable. (3) Governance estimates the fixed effects model with only the governance dimension as independent variable. Governance int. is the interaction term of the standardized value of governance with time. Robust standard errors are given in parenthesis.
* p<0.05, ** p<0.01, *** p<0.001

the results are displayed including the control variables. The inclusion of dummy variables as independent variables does not affect the results for the environmental and governance pillar but does change the coefficient of the social pillar from negative to positive. The interaction term for governance stays positive and significant.

Table 4: Dependent variable: market leverage ratio

	Dummy estimation
Social dummy	0.0311
	(0.0240)
Environmental dummy	-0.0282
	(0.0242)
Governance dummy	-0.0102
	(0.0229)
Governance int.	0.0396***
	(0.0092)
Year dummies	yes
Observations	18,508

* In this model the independent variables are placed into the category high (observation above median) or low (observation below median). Governance int. is the interaction term of the standardized value of governance with time. Robust standard errors are given in parenthesis.
* p<0.05, ** p<0.01, *** p<0.001

4.2.3 GMM

Generalized method of moments (GMM) estimation is an estimation technique used for dynamic panel models. Generalized methods of moments estimation stems from the more simple estimation technique called methods of moments. The principle of methods of moments will be explained after which it's generalisation, GMM, will be clarified.

In conducting analyses, it is rarely possible to obtain information on the whole population. Hence, only a sample of the whole population is used in order to provide a meaningful interpretation of the whole population. The principle of moment estimation is to estimate population moments by sample moments. The expected value of a variable is its mean:

$$E(y) = \mu$$

And the expected difference between the observation and the mean is 0:

$$E(y - \mu) = 0$$

The empirical moment condition then is as follows:

$$\frac{1}{n} * \Sigma_i (y_i - \mu) = 0$$

The estimate of the sample mean is then the average, which yields the following equation:

$$\mu_{mm} = \frac{1}{n} * \Sigma_i y_i$$

This principle can be extended to regression; we estimate the following equation:

$$y_i = X_i \beta + u_i$$

A basic condition for any such linear regression is:

$$E(\mu_i \mid X_{ki}) = 0$$

In words, this means that the expected error given our variables is zero; hence the explanatory variables are uncorrelated with the error term. This condition has to hold for every explanatory variable; this gives an equation for each explanatory variable. Now, the error term is replaced by its value in the population:

$$y - x\beta$$

Beta is the unknown regression coefficient. For each of these k explanatory variables, a cross product between the explanatory variable and its error

term is set up, which gives an expression in the k beta coefficients. The empirical moment conditions are that the cross-product of the explanatory variable and the error term has to be zero for each explanatory variable; this gives the k moments equations:

$$E[x_{ik}(y_i - x_{ki} * \beta_k)] = 0, for\ each\ k$$

and

$$\frac{1}{n} * \Sigma_i x_i(y_i - x_i\beta) = 0$$

In methods of moments, there are k equations for k unknowns, so each k has a moment equation. The solution for the equations is least squares estimation. If there is an equal number of unknowns and equations, the solution is exact. This is methods of moments estimation. However, when there are more moments than parameters, for example, six moments and three parameters, you can write six equations for three parameters. Depending on which three equations you take, you get a different estimate. This is where the generalisation comes into play; we are now estimating a generalised methods of moments equation. In GMM, not three but all six equations are satisfied as best as possible, in which the moment conditions with larger variances are weighted less because these moment conditions contain less information on the population parameters (Wooldridge, 2001).

GMM will be implemented as the final robustness check. The argumentation for this is threefold: (1) GMM can address endogeneity bias. Endogeneity bias is a common problem in economic research and can arise from common method variance (CMV), measurement errors and omitted variables. It is possible that both measurement errors and omitted variables bias arise in the dataset. (2) Generalized methods of moment (GMM) models are a good fit for dynamic panel data in which it is probable that the cause and effect relationship is dynamic over time (Ullah, Akhtar, & Zaefarian, 2018). It is likely that such a dynamic relationship is present in the data because the current capital structure is highly related to the capital structure of the prior year. (3) A dynamic panel model is better able to capture the change in the strength of the effect of CSR on leverage over time (H2).

In order to perform GMM, the following assumptions should be met:

- Some regressors may be endogenously determined
- The relationship has a dynamic nature, with current values of the dependent variable influenced by past ones

- The idiosyncratic disturbances are uncorrelated across individuals
- There may be arbitrarily distributed fixed individual effects
- The idiosyncratic disturbances may have individual-specific patterns of serial correlation and heteroscedasticity (Roodman, 2006).

There are some additional assumptions which shape the design of the model:

- Some regressors may not necessarily be strictly exogenous; these regressors are called predetermined. A predetermined variable might be influenced by past disturbances; however it might not be influenced by current or future disturbances
- the time periods T may be small (small T, large N dataset) (Roodman, 2006).

Finally, GMM is characterised by the use of instrumental regressors. However, GMM is designed for general use and therefore it is not assumed that there are any good instruments available outside the immediate dataset. Hence, the final assumption is as follows:

- the only instruments available are 'internal' ones, which are based on the lags of instrumental variables (Roodman, 2006).

All of these assumptions are valid for the dataset.

There are two essential statistics to support the validity of the model. The first is the Hansen statistics, which tests for the overidentifying restrictions. Instruments used should be exogenous; the Hansen statistic detects whether the instruments used are exogenous and thus whether they are valid instruments. A significant statistic is a sign of an invalid model. However, a large number of instruments can bias the statistic and hence can even provide a perfect statistic of 1.000. Such high statistics are a sign that the Hansen test might be biased. Roodman (2006) advices not to take comfort in a Hansen statistic below 0.1, and to view values above 0.25 as potential signs of trouble.

The second important statistic is the Arellano-bond statistic. The Arellano-Bond test identifies whether there is autocorrelation in the model. A negative first-order autocorrelation is expected because Δv_{it} and $\Delta v_{i,t-1}$ are related via the shared $v_{i,t-1}$ term, and is therefore uninformative. Much

more important is the second-order autocorrelation statistic; if this statistic is significant, autocorrelation is a problem in the model (Roodman, 2006).

In conducting a GMM analysis, many decisions have to be made. Following the advice of Roodman (2006), these decisions and the argumentation for them are clarified in the next section to provide openness. Firstly, difference GMM is applied instead of system GMM because, by showing a highly significant Hansen test, system GMM proves to be inconsistent[2]. Secondly, a two-step procedure is used because it is robust to heteroscedasticity and serial correlation, which the one-step estimation technique is not. Next, in order to conduct a GMM analysis, the variables need to be classified as either endogenous, predetermined or exogenous because each will be treated differently. The social and environmental dimension of CSR can both be seen as corporate activities that are not strictly necessary for the survival of the firm. Leverage might affect the social and environmental pillar in the way that higher debt comes with higher risk of financial distress and hence companies might resort to their principal activities to avoid bankruptcy. It is likely that current leverage does not influence past or current levels of social and environmental performance. On the other hand, it is likely that leverage does affect future levels of social and environmental performance since this is not a relationship that takes place immediately after retaining more debt. Following this argumentation, social and environmental dimensions of CSR are classified as predetermined. The governance dimension might be affected by high leverage in the way that the firm is prone to financial distress and hence might resolve to dirty corporate governance practices. Again, this relationship is not expected to take place immediately; it is likely that high levels of leverage affects corporate governance over the long term and not current or past corporate governance levels. Hence, corporate governance is classified as a predetermined variable. Company size is not affected by leverage in any way, which makes it an exogenous variable. Return on assets, which is measured as EBITDA over assets, is also classified as exogenous since it measures returns before interest expense or dividend payments and thus is not influenced by leverage. Market to book ratio is measured as the market value of the firm divided by common equity, which makes it an endogenous variable because it is directly related to the leverage ratio. Selling, general and administrative (SGA) expenses are fixed to a large extent because it includes fixed expenses such as mortgage and rent on buildings

[2]An inconsistent estimator means that the property of the estimator converging to the real value when the sample size increases, does not hold. Hence, a consistent estimator is preferred over an inconsistent one.

and insurance. Hence, SGA expenses are classified as exogenous. Financial slack, measured as cash and cash equivalents, is classified as endogenous because interest payments are paid in cash, and thus leverage is directly related to the amount of cash & cash equivalents. The higher the leverage, the higher the fixed interest payments and thus the lower the amount of money that is left for shareholders. A high leverage ratio decreases the possibility that the firm pays out dividends, but there is expected to be a lag due to slow convergence to a different debt/equity ratio, which makes the dividend dummy a predetermined variable. Leverage is not expected to affect tangible or total assets in any way; hence the variable asset structure is classified as exogenous. Liquidity, measured as current assets over current liabilities, is classified as an endogenous variable because leverage is directly linked to current liabilities since current liabilities is a portion of total leverage. Non-debt tax shields are possibly more applied by firms whose leverage ratio is low because a high leverage ratio already provides much tax advantages. Hence, non-debt tax shields are classified as endogenous. Finally, the predetermined variables are lagged one period while the endogenous variables are lagged two periods, which is standard practice in applying GMM. The first, second and third lags are used as instruments for the predetermined variable and the second and third lags are used as instruments for the endogenous variable. Taking further lags is not considered appropriate since the Hansen test points out that these further lags are weak instruments.

Model 1 and model 2 from the main analyses are estimated using the GMM estimation technique. The results from the GMM analyses are reported in table 5. Model 1 in table 5 reports the results of the GMM estimation without the interaction terms, and model 2 reports the results including the interaction terms. For model 1, the social and environmental dimensions are still negative and insignificant. However, the governance dimension is now negative and significant. In model 2, the interaction terms for the social and environmental pillar are still insignificant, and the corporate governance pillar is not significant anymore. Hence, none of the interaction terms should be incorporated in the GMM estimation and model 1 is the appropriate model.

Table 5: Dependent variable: market leverage ratio

	Model 1 GMM	Model 2 GMM
L.leverage	0.435***	0.408***
	(0.0452)	(0.0478)
Social	-0.000810	-0.00274
	(0.0014)	(0.0027)
Environmental	-0.00132	-0.00187
	(0.0015)	(0.0034)
Governance	-0.00388*	-0.000817
	(0.0016)	(0.0022)
Size	0.882***	0.851***
	(0.0738)	(0.0724)
ROA	-0.0150***	-0.0151***
	(0.0024)	(0.0024)
MTB ratio	-2.704	-2.985
	(1.5457)	(1.7128)
SGA expenses/sales	-0.00881***	0.00784***
	(0.0024)	(0.0022)
Financial slack	-1.066	-0.897
	(0.8615)	(0.8602)
Dividend dummy	-0.0144	-0.0233
	(0.0684)	(0.0698)
Asset structure	0.279*	0.245
	(0.1345)	(0.1277)
Liquidity	-0.0716	-0.0657
	(0.0455)	(0.0452)
Non-debt tax shields	-6.176*	-5.922*
	(2.7581)	(2.7011)
Social int.		0.0807
		(0.0728)
Environmental int.		-0.0260
		(0.0763)
Governance int.		0.0257
		(0.0293)
Year dummies	yes	yes
Hansen statistic	0.252	0.202
AR(1)	-6.94***	-6.52***
AR (2)	-0.58	-0.69
Observations	15,083	15, 083
Instrument count	39	48

* Model (1) and (2) depict the results from the GMM estimations. Model (1) estimates the same equation as in the main analysis. Model (2) includes interaction terms of the independent variables with time. L.leverage is the lag of the dependent variable. Social int. is the interaction term of the standardized value of social with time. Environmental int. is the interaction term of the standardized value of environmental with time. Governance int. is the interaction term of the standardized value of governance with time. AR(1) provides the Arellano & Bond z statistic for the first lag. AR(2) provides the Arellano & Bond z statistics for the second lag. Robust standard errors are given in parenthesis.
* p<0.05, ** p<0.01, *** p<0.001

5 Discussion & Conclusion

5.1 Discussion and implications

The aim of the study was to provide insight into the relationship between Corporate Social Responsibility and the capital structure, and how the strength of the relationship changes over time. The study provides no evidence for the existence of a relationship between the social aspect of CSR and capital structure. This finding is contradictory to the limited existing research on this topic by Bae, Kang & Wang (2011), Girerd-Potin, Jimenez-Garces & Louvet (2011), Pijourlet (2013) and Verwijmeren & Derwall (2010). A reason for this might be that Bae, Kang & Wang (2011) and Verwijmeren & Derwall (2010) only focus on a sub-part of the social pillar, the employment treatment index score and employee wellbeing respectively. The social pillar of the ASSET4 data used in this thesis consists of over 200 metrics that together determine the social pillar score which makes the results less sensitive to specific or outlier metrics, but there is also less room for nuance. It might be the case that different metrics have a different effect on the capital structure and that these studies might have used a metric that shows a stronger negative relationship than the average of all metrics. Another explanation for these contradictory results might be that Girerd-Potin, Jimenez-Garces & Louvet (2011) and Pijourlet (2013) retrieve data on the social dimension from a different database, the Areso and Vigeo rating agencies and MSCI ESG Research respectively. The social ratings are constructed differently and hence are likely to capture different elements. For example, data from the Areso and Vigeo rating agencies might be focussed on information relevant for rating agencies. Furthermore, the time periods incorporated by these papers are shorter and go up to only 2005, 2007 and 2009. Hence, there is only limited overlap in the time period considered. Finally, Verwijmeren & Derwall (2010) use ordinary least squares estimation to estimate the effect of social performance on leverage. Ordinary least squares estimation is not considered the appropriate estimation technique since it does not account for firm-specific differences and it provides no dynamic interpretation to the results. The results of the OLS estimation are tabulated in table A5 in the appendix and indeed show a significant negative relationship. Hence, the use of the wrong estimation technique might also explain the difference in results. Overall, the results do not provide evidence for either a negative or a positive relationship between social performance and capital structure. Accordingly, there is no support for either the increased investor base hypothesis or the reputation hypothesis, and H1

cannot be accepted.

The same is true for environmental performance, which consistently does not show a significant relationship with leverage. This finding is in line with the outcome of the study by Pijourlet (2013), which also does not show a significant relationship between environmental performance and leverage. The authors argue that this might be because environmental activities are less recognised or less important than other CSR activities. However, a different study on environmental risk management and the cost of capital by Scharfman & Fernando (2008) shows that the environmental performance of firms does matter. The study finds that not only does environmental risk management reduce the cost of capital overall, but it in particular also reduces the use of equity and increases the use of debt (Scharfman & Fernando, 2008). The contradictory findings could be explained by a different measure of environmental performance. The environmental data from Scharfman & Fernando (2008) is retrieved from the KLD database; the KLD database examines only seven strengths and weaknesses as a basis for the environmental rating. Again, the many metrics of which the ASSET4 data consists might explain the difference in results.

Finally, while the corporate governance pillar shows no significant relationship in most analyses, the GMM estimation does provide support for a negative relationship between corporate governance performance and leverage. This finding is in line with earlier research and hence provides some evidence for the increased investor base hypothesis. However, the evidence is not as overwhelming as the reported evidence of earlier studies. The findings of the corporate governance pillar provide some support for the increased investor base hypothesis.

The interaction terms of the social and environmental pillar with time are not significant, which means that the effect of the social and environmental pillar on leverage has neither decreased nor increased over time. It seems that although social and environmental performance have become more important over the years, their effect on leverage has not changed. A possible explanation for this is that initially, the concepts of social and environmental performance were rather new and consequently had a substantial impact. Since these activities are now more and more considered as usual practices, the effect remained constant. On the other hand, the interaction term of governance with time does show a significant positive relationship. Hence, the effect of corporate governance performance on leverage has increased over the years, and hypothesis 2 is partially supported.

This thesis also has some interesting managerial implications. Indeed, the results enable managers to gain a better understanding of the implications of their CSR policies for their financing decisions. Social and environmental performance show not to affect the capital structure and thus do not have to be taken into account in making financing decisions. There is some evidence that corporate governance performance is negatively related to leverage, and hence this factor cannot be omitted in making these decisions. Secondly, managers could use this information to reduce the firm's dependence on market conditions in issuing equity. The sometimes negative relationship of corporate governance performance could indicate that it is easier for a firm to attract equity when it has a high corporate governance score. Hence, firms could use corporate governance performance as a tool in reducing the importance of market conditions in issuing equity. Finally, the effect of corporate governance performance has increased over time, suggesting that firms might want to pay more attention to their corporate governance practices to keep managing their financing policies effectively.

5.2 Conclusion, limitations and future research

This thesis presents the results of a quantitative study on the relationship between firm's Corporate Social Responsibility (CSR) performance and capital structures. In this study, a distinction is made between three types of CSR, namely social, environmental and corporate governance activities to capture different aspects of CSR. A fixed effects estimation technique is used to capture the relationship between CSR and capital structure. To capture the dynamics of this relationship, interaction terms of the independent variables with time are incorporated to evaluate the strength of the effect over time. The social and environmental pillars are negative but insignificant in all models; the interaction terms of the social and environmental pillar with time are also insignificant which means that their effect has not changed over time. The corporate governance dimension is insignificant in most models except the GMM estimation, where it shows a negative relationship with leverage. In all models, except the GMM estimation, the governance pillar interaction term is significant and positive, which indicates stronger importance of corporate governance in the determination of the capital structure.

As with any research, this thesis is prone to certain limitations. Firstly, there are many missing observations in the dataset which could potentially bias the results, with an N of 7,215 and a T of 15, there could be 108,225 firm-year observation, but when matching available observations, a dataset of

18,508 firm-year observations remains. Data availability also has limited the research because ASSET4 data is only available from the year 2002 and alternative datasets, with larger timespans, were not available at the Radboud University. A longer timeframe could, in particular, have offered a better perspective on the results of the second hypothesis, where the strength of the relationship over time is concerned. Finally, there is relatively little prior research on this topic which complicates the reliance on scientific literature.

The results of this thesis open opportunities for interesting future research. Firstly, the concept CSR could be disentangled even further. It is possible that the many metrics that construct one CSR dimension have a different influence on leverage. Future research could address this concern by incorporating individual metrics into the analysis. Another possibility is for future research to incorporate the effect on different aspects of the capital structure. CSR might have a different effect on private debt than it has on public debt. Finally, there is some support for a relation between leverage and corporate governance. Although this thesis assumes leverage to be the dependent variable, the causal direction of this relationship is not tested. Future research could address this issue by testing the causality of the relationship.

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A Appendix

Table A1: Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Leverage	1.0000												
2 Social	-0.0029	1.0000											
3 Environmental	0.0094	0.8053***	1.0000										
4 Governance	-0.1474	0.3104*	0.2274	1.0000									
5 Size	0.3109	0.2025	0.2751	-0.4001*	1.0000								
6 ROA	-0.2643	0.0383	0.0006	0.0042	-0.0230	1.0000							
7 SGA	-0.0080	-0.0187	-0.0275	-0.0025	-0.0437	-0.0348	1.0000						
8 MTB ratio	-0.0254	0.0112	-0.0056	0.0080	-0.0076	0.0509	0.0039	1.0000					
9 Financial slack	-0.2049	-0.0780	-0.0627	-0.1299	0.0038	0.1122	0.0055	0.0128	1.0000				
10 Dividend dummy	-0.0660	-0.2037	0..2132	-0.0786	0.2005	0.1577	-0.0536	-0.0063	-0.1109	1.0000			
11 Asset structure	0.0641	0.0806	0.1286	-0.0934	0.0715	-0.1165	-0.0060	-0.0040	0.0320	0.0069	1.0000		
12 Liquidity	-0.2070	-0.1136	-0.0971	-0.0078	-0.1046	0.0601	0.0273	-0.0037	0.4074*	-0.0781	0.0263	1.0000	
13 NDTS	0.0547	-0.0323	0.0314	0.0373	-0.0311	-0.1348	-0.0244	0.0071	-0.1242	-0.0733	0.6466**	-0.0930	1.0000

* NDTS stands for non-debt tax shields,
* >0.30, ** >0.50, *** >0.70

Table A2: Control variables overview

Variables	**Literature**	**Measure**
Firm size	Deesomsak, & Paudyal & Pescetto (2004), Frank & Goyal (2009), Hovakimian, Opler & Titman (2001), Jong, Kabir & Nguyen (2008), Rajan & Zingales (1995)	Natural log of total assets
Profitability	Baskin (1989), Chen (2004), Chittenden, Hall & Hutchinson (1996), Friend & Lang (1988), Huyang & Song (2006), Kester (1986), Lipson & Mortal (2009), Titman & Wessels (1988)	MTB ratio
Growth opportunities	Chen (2004), Chung (1993), Deesomsak, Paudyal & Pescetto (2004), Huang & Song (2006), Ozkan (2001), Titman & Wessels (1988)	ROA
SGA expenses	Bae, Kang & Wang (2011)	$\frac{SGAexpenses}{Sales}$
Financial slack	Gaud, Hoesli & Bender (2007), Pijourlet (2013), Verwijmeren & Derwall (2010)	$\frac{Cash\&cashequivalents}{Totalassets}$
Dividend payments	Bae, Kang & Wang (2011), Pijourlet (2013)	dividend dummy
Asset structure	Chen (2004), Chung (1993), Pijourlet (2013)	$\frac{currentassets+ppe+othertangibleassets}{totalassets}$
Liquidity	Deesomsak, Paudyal & Pescetto (2004), Jong, Kabir & Nguyen (2008), Ozkan (2001)	$\frac{currentassets}{currentliabilities}$
Non-debt tax shields	Bradley, Jarell & Kim (1984), Deesomsak, Paudyal & Pescetto (2004), Huang & Song (2006), Ozkan (2001)	$\frac{depreciation}{totalassets}$

* ppe = property, plant & equipment

Table A3: Dependent variable: market leverage ratio

	(1) Social	(2) Environmnetal	(3) Governance
Social	-0.000264		
	(0.0009)		
Environmental		-0.0000251	
		(0.0008)	
Governance			-0.000670
			(0.0009)
Size	0.516***	0.516***	0.517***
	(0.0490)	(0.0491)	(0.0487)
ROA	-0.0208***	-0.0208***	-0.0208***
	(0.0023)	(0.0023)	(0.0023)
MTB ratio	-0.422*	-0.422*	-0.423*
	(0.2044)	(0.2047)	(0.2033)
SGA expenses/sales	0.00221	0.00221	0.00219
	(0.0045)	(0.0045)	(0.0045)
Financial slack	-1.068***	-1.067***	-1.069**
	(0.2826)	(0.2827)	(0.2831)
Dividend dummy	-0.202***	-0.202***	-0.202***
	(0.0439)	(0.0439)	(0.0440)
Asset structure	0.369***	0.368***	0.369***
	(0.0899)	(0.0899)	(0.0899)
Liquidity	-0.145***	-0.145***	-0.145***
	(0.0243)	(0.0243)	(0.0243)
Non-debt tax shields	-0.915	-0.908	-0.927
	(1.0413)	(1.0426)	(1.0407)
Governance Int.	0.0391*	0.0393*	0.0393*
	(0.0189)	(0.0188)	(0.0188)
Year dummies	yes	yes	yes
Observations	18,508	18,508	18,508

* (1) Social estimates the fixed effects model with only the social dimension as independent variable. (2) Environmental (2) estimates the fixed effects model with only the environmental dimension as independent variable. (3) Governance estimates the fixed effects model with only the governance dimension as independent variable. Governance int. is the interaction term of the standardized value of governance with time. Robust standard errors are given in parenthesis.
* p<0.05, ** p<0.01, *** p<0.001

Table A4: Dependent variable: market leverage ratio

	Dummy estimation
Social dummy	0.0311
	(0.0240)
Environmental dummy	-0.0282
	(0.0242)
Governance dummy	-0.0102
	(0.0229)
Size	0.515***
	(0.0218)
ROA	-0.0208***
	(0.0009)
MTB ratio	-0.427
	(0.2257)
SGA expenses/sales	0.00217
	(0.0025)
Financial slack	-1.070***
	(0.1171)
Dividend dummy	-0.202***
	(0.0265)
Asset structure	0.368***
	(0.0447)
Liquidity	-0.145***
	(0.0092)
Non-debt tax shields	-0.911
	(0.5998)
Governance Int.	0.0396***
	(0.0092)
Year dummies	yes
Observations	18,508

* In this model the independent variables are placed into the category high (observation above median) or low (observation below median). Governance int. is the interaction term of the standardized value of governance with time. Robust standard errors are given in parenthesis.
* p<0.05, ** p<0.01, *** p<0.001

Table A5: Dependent variable: market leverage ratio

	(1) OLS	(2) OLS	(3) OLS
Social	-0.00299***	-0.00316***	-0.00300***
	(0.0006)	(0.0006)	(0.0006)
Environmental	-0.00128*	-0.00105	-0.00131*
	(0.0006)	(0.0006)	(0.0006)
Governance	-0.00201**	-0.00237***	-0.00237***
	(0.0006)	(0.0006)	(0.0006)
Size	0.327***	0.326***	0.327***
	(0.0095)	(0.0095)	(0.0095)
ROA	-0.0378***	-0.0378***	0.0378***
	(0.0011)	(0.0011)	(0.0011)
MTB ratio	-0.944**	-1.005**	-1.004**
	(0.3422)	(0.3422)	(0.3422)
SGA expenses/sales	-0.00390	-0.00398	-0.00392
	(0.0031)	(0.0031)	(0.0031)
Financial slack	-3.063***	-3.056***	-3.057***
	(0.1036)	(0.1036)	(0.1036)
Dividend dummy	-0.379***	-0.380***	-0.380***
	(0.0263)	(0.0263)	(0.0263)
Asset structure	0.189***	0.190***	0.190***
	(0.0353)	(0.0353)	(0.0353)
Liquidity	-0.189***	-0.190***	-0.190***
	(0.0091)	(0.0091)	(0.0091)
Non-debt tax shields	-2.345***	-2.406***	-2.390***
	(0.5167)	(0.5173)	(0.5170)
Social int.		0.0175	
		(0.0190)	
Environmental int.		-0.0232	
		(0.0179)	
Governance int.		0.0301*	0.0307*
		(0.0129)	(0.0125)
Year dummies	yes	yes	yes
Country dummies	yes	yes	yes
Industry dummies	yes	yes	yes
Observations	18,508	18,508	18,508

* (1) OLS estimates model (1) from the main analysis using OLS regression. (2) OLS estimates model (2) of the main analysis using OLS regression, which includes the interaction terms. OlS (3) re-estimates (1) OLS, including the significant interaction term. Social int. is the interaction term of the standardized values of social with time. Environmental int. is the interaction terms of the standardized values of environmental with time. Governance int. is the interaction of the standardized values of governance with time. Robust standard errors are given in parenthesis.

* p <0.05, ** p<0.01, *** p<0.001