A TEST OF THE VIRTUOUS CYCLE OF CORPORATE SOCIAL RESPONSIBILITY

Testing the relation between corporate social performance and corporate financial performance.

Master thesis
R.B.A Wissink
University of Twente
Business Administration

Graduation commission:
Prof. dr. N.P. Mol
Drs. G.C. Vergeer RA
Dr. P.A.T.M. Geurts

Foreword

This thesis is the graduation assignment for my master's program Business Administration at the University of Twente.

In previous work I've tried to find solutions for practical business problems, for this thesis I decided to look for a more theoretical challenge. I found such a challenge in the field of tension between corporate responsibility and financial performance. I dived into the history of corporate social responsibility and its relation to financial performance, and tested this relationship myself. The results of which can be found in this thesis.

I would like to thank my supervisors, prof. dr. N.P. Mol and drs. G.C. Vergeer RA for their help during the realization of this thesis, and dr. P.A.T.M. Geurts for his statistical advice.

I enjoyed my time working on this thesis; I hope you will enjoy reading it.

Rutger Wissink
April 2012

Table of contents

Abstract

In this thesis, the field of tension between corporate social responsibility and financial performance is addressed in an examination of the relationship between the two concepts. In recent decades, many theories about the relationship between corporate social performance and corporate financial performance were put forward, ranging from a predicted negative impact of corporate social responsibility on financial performance to a positive relation from financial performance to corporate social performance. In the same period, many of these theories and predictions were put to the test. Results from these tests were often contradictory. Partly, this is due to differences in research methodology and different ways of conceptualizing and operationalizing the variables of interest. Overall, the combined results suggest that the relationship between corporate social responsibility and corporate financial performance is at least neutral and perhaps slightly positive. However, the different approaches make it difficult to come to a final answer. In this thesis, the relation was put to the test once more, but only after trying to come to a more universal conceptualization and operationalization of the variables.

Corporate social responsibility (CSR) finds its origin somewhere in the 1930's. In subsequent years, many definitions of the concept were given by different authors, and many concepts related to, or perhaps similar to, CSR were introduced. In retrospect, the development of the definition of the CSR concept, and related concepts, has centered on two themes: corporate relations in the economic, societal and environmental dimension, and sustainability. By combining these themes, the following definition was created: *Corporate social responsibility refers to a company's actions to include the interests of its stakeholders in the economic, social and environmental domain in its business operations, and to a company's actions aimed at guaranteeing the continued existence, at least at an equal level, of the company, society and the environment at large*. Corporate social performance (CSP) was then defined as the extent to which companies are successful in implementing these actions. Corporate financial performance (CFP) was defined as the financial outcome of business operations.

Operationalization of corporate social performance is based on inclusion in the Dow Jones Sustainability Index. The DJSI is an independently verified index of the world's leading sustainable companies. Yearly, the world's 2500 largest companies are assessed on general and industry specific sustainability criteria by means of self-report questionnaires, media- and stakeholder analysis, and data from secondary sources (company websites, annual reports, etc.) The sustainability criteria are identified through the assessment of economic, environmental and social driving forces and trends. The DJSI approach to identifying sustainability leaders fits nicely to the definition of corporate social responsibility and performance suggested in this thesis, and can serve as a reliable source of information now and in the future. Disadvantages of using the DJSI include the binary nature of the data, and the limitations it imposes on the theoretical framework due to the limited information available. Corporate financial performance was operationalized by means of three different accounting variables: return on assets is used to measure how well a company can turn its assets into revenue, return on equity measures the return on ownership equity, and return on sales is used to determine the operating performance.

In determining the relation between CSP and CFP, instrumental stakeholder theory, slack resources theory, and the resource-based view were considered. The RBV claims that companies that are equipped with valuable resources that are rare, difficult to imitate and hard to substitute have a competitive advantage over companies that do not have these resources, resulting in above average returns. Instrumental stakeholder theory and slack resources theory both state that the relationship between CSP and CFP is positive. Slack resources theory describes a positive relation from CFP to CSP based on the availability of slack, financial resources; companies that have resources to invest in CSR will perform better. Instrumental stakeholder theory delineates a positive relation from CSP to CFP based on relations with stakeholders; CSR has a positive impact on a corporation's relationship with stakeholders, these improved relationships ultimately result in financial performance.

The combination of these two theories with the RBV results in a virtuous cycle of CSR. Slack financial resources have a positive impact on four intangible, valuable assets (reputation, innovative power, human capital, and culture), resulting in above average social performance. CSP, in turn, positively influences the same four intangible assets, resulting in above average financial performance.

Due to limitations in the data, hypotheses were developed based on a virtuous cycle that does not include the resource-based view but does include slack resources theory and instrumental stakeholder theory: hypothesis 1, better corporate financial performance results in better corporate social performance; and hypothesis 2, better corporate social performance results in better corporate financial performance.

These hypotheses were tested by means of multivariate statistical tests. Based on the results of these tests, the following conclusions were drawn. Size and institutional context are determinants of corporate social performance; larger firms have a greater chance of being included in the DJSI, as do firms originating from Europe compared to those from North America. Return on assets and return on sales are positively related to subsequent social performance, when firm size is appropriately controlled for, providing evidence of the slack resources theory. Corporate social performance is positively related to subsequent financial performance, providing evidence of the instrumental stakeholder theory.

These results show that corporate social performance does not come at a cost to shareholders. Taken together, the results provide evidence of a virtuous cycle of corporate social responsibility. Better corporate financial performance results in better corporate social performance and, in turn, better corporate social performance results in better financial performance. Both return on assets and return on sales take part in this cycle; however, return on equity is not associated with subsequent corporate social performance and corporate social performance is not related to subsequent return on equity. Based on all of the above, the answer to the research question must be: corporate social performance and corporate financial performance are positively related in the form of a virtuous cycle.

1. Introduction

In this chapter the general field of interest of this thesis is presented: corporate social responsibility. After a brief discussion of the concept, the research question is introduced.

1.1 Introduction to the topic

In recent decades, much attention has been paid to the role and responsibilities of the corporation in society. During these years, the increasing power of corporations has resulted in cries for a more balanced wealth distribution and ways to diminish the arisen inequalities. Since governments and regulatory bodies have proven not to be able to deal with these issues adequately, many hope that corporate self-regulation, in the form of corporate social responsibility (CSR), will aid in resetting the balance. Companies aim to retain their 'license-to-operate' by engaging in CSR activities (Halme & Laurila, 2009).

Not too long ago, many would argue that a company's only responsibility is to maximize profits while staying within the boundaries of the law (e.g. Friedman, 1970). However, increasing corporate power and increasing awareness of environmental and social issues among the general public make it difficult for companies to limit their responsibility to profit making. This is mirrored in the development of CSR: at first not taken seriously, currently CSR is promoted society-wide. Corporations, non-governmental organizations (NGO's), governments, and consumers, all actively promote and endorse CSR (e.g. Lee, 2008; McWilliams & Siegel, 2000). However, opinions on what CSR is, or should be, vary and implementations of CSR vary accordingly (e.g. Fifka, 2009).

The question that follows is then: what is a company responsible for? At the moment there is no agreement on the exact responsibilities of corporations, and, by extension, there is no definite definition of CSR. However, one cannot deny the influence of CSR on society; it seems that almost all companies feel that they have more responsibilities than profit-making. No longer are only economic impacts considered, the impact of the corporation on society and the environment is also considered. The individual approaches to these responsibilities may vary, at least corporations have accepted the responsibility (Doh & Guay, 2006; Lopez et al., 2007).

The developments in this field have not gone unnoticed in the academic world. Many scholars have dedicated their time to the subject. Most of the research literature concerning CSR has focused on either defining the concept or on the interplay between CSR and financial performance. This relationship received a lot of attention in particular.

Even though corporations are expected to take on more than one responsibility, and do so, the dominant view still is that they their primary responsibility is value creation for shareholders (Margolis et al., 2007). For this reason, it is interesting to see how companies that outperform others in terms of social responsibilities, perform in financial terms. Many scholars have theorized about this relation and many have put these theories to the test. On average, a small positive relation between CSR and financial performance was found (e.g. Orlitzky, 2003). However, due to problems of definition, operationalization, theoretical foundations and other issues, a definite positive relation cannot be inferred from these results (e.g. Peloza, 2009).

Because CSR is so topical and an interesting field of research, this subject was chosen to be addressed in this thesis. The Dow Jones Sustainability Index is used as data source for the research, offering many advantages. A disadvantage of these data is their limited, binary nature; companies are either in- or excluded and no further information is available. Therefore, variables put forward to moderate the relationship between corporate social performance and corporate financial cannot be addressed in a theoretical framework based on data from the DJSI. In this thesis, the relationship between corporate social performance and corporate financial performance is, for this reason, addressed directly.

1.2 Research question

Based on the discussion above, the following research question is formulated:

What is the relationship between corporate social performance and corporate financial performance?

To further structure the thesis, and to guide the research, the following subjects will be addressed:

Concerning the relation between corporate financial performance and corporate social performance, what is the current state of the art in academic literature?

What is the history of the corporate social responsibility concept, and which definition is most suitable for studying the relation between corporate social performance and corporate financial performance?

What is meant with corporate financial performance, and how can it be defined to be of instrumental value for studying the relation between corporate social performance and corporate financial performance?

How can the concepts be operationalized, and tested, in order to determine the relation between corporate social performance and corporate financial performance in a way that advances on current knowledge?

Which conclusions can be drawn, based on the literature review and the empirical evidence?

Which implications does this research have for future research on the relation between corporate social performance and corporate financial performance?

To answer the research question, a review of the body of literature on the relation between corporate social performance and corporate financial performance is conducted, supported by an examination of this relationship in real world companies.

2. Theories and evidence

Based on the research question, literature on the relationship between corporate responsibilities and corporate financial performance was examined. An overview is given in section 2.1; different theories and empirical findings will be described, and an overview of methodological and theoretical issues that have to be taken into account is provided. In section 2.2 the concepts used in this thesis are defined. Finally, testable hypotheses, based on the theory, are developed in section 2.3.

2.1 Literature overview

In trying to establish a relationship between corporate social performance (CSP: how well companies perform in the field of corporate social responsibility) and corporate financial performance (CFP) scholars have theorized in many different directions and thought of many mechanisms that could explain such a link. In this section, some of the more influential ideas are reviewed. A distinction has been made between theoretical and empirical work, first the attempts to address the link between CSP and CFP will be discussed, followed by results from empirical research into the theorized connection between CSP and CFP.

2.1.1 Theories

Preston and O'Bannon (1997) argue that in the relationship between corporate social performance and financial performance two different issues are to be considered: the sign of the relationship and the direction of causation. The relationship can either be positive, neutral or negative. Furthermore, a change in CSP can cause a change in CFP and vice versa. Since this logic holds today as it did then, the same classification is used here, completed with a category of theories that do not fall in this classification. The different theories and assumptions that address the relation between CSP and CFP are summarized in table 1 and reviewed in more detail below.

Table 1
Theories and assumptions that address the relation between CSP and CFP.

Sign	Direction	Theory	Short description
+	CSP → CFP	Instrumental stakeholder theory	Originally by Jones (1995), multiple variations (e.g. good management theory, Waddock & Graves (1997)). Firms benefit from high CSP by creating goodwill from stakeholders or improving internal resources.
+	CSP → CFP	Management skill	CSP is a proxy for management skills resulting in comparable performance in other domains (e.g. Alexander and Buchholz, 1978).
+	CSP → CFP	Stakeholder-agency theory	The relationship with stakeholders monitors and enforces management to keep to broad organizational goals (Orlitzky et al., 2003).
+	CFP → CSP	Slack resources	Availability of financial resources is a determinant of CSP; firms that are able to invest in CSR will perform better (Waddock and Graves, 1997).
+	CSP → CFP CFP → CSP	Virtuous cycle	Waddock and Graves (1997) argue that CSP leads to CFP and CFP leads to CSP (a combination of good management theory and slack resources theory).

Table 1
Continued.

-	CSP → CFP	Trade-off theory	Firms have to choose, either invest in CSP or in CFP. Firms that invest in CSP are at a competitive disadvantage compared to firms that chose not to (Friedman, 1970; McGuire et al., 1988).
-	CFP → CSP	Managerial opportunism hypothesis	Managers with a short-term outlook, for example due to remuneration plans, will attempt to cash in when performing well financially. When not performing well, managers will attempt to disguise this by investing heavily in CSP (O'Bannon & Preston, 1997).
-	CSP → CFP CFP → CSP	Negative synergy	O'Bannon and Preston (1997) argue that the possibility exists that CSP negatively influences CFP, which in turn has a negative effect on CSP.
Other		Inverted 'U'	There is an optimal level of CSP, deviations from this level result in lower CFP (Salzmann, 2005; Barnett and Salomon, 2006).

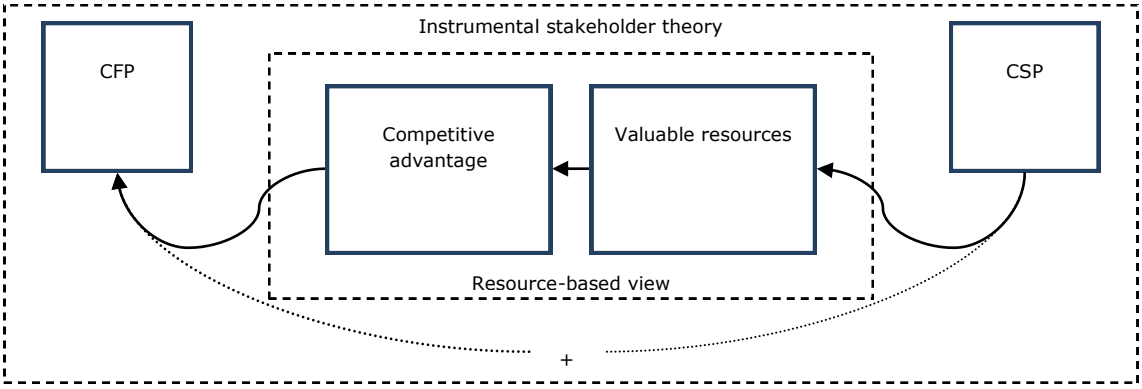
Stakeholder theory

In theorizing about the relation between CSP and CFP most theorists work towards a positive association. In their reasoning, many scholars base this expectation on benefits derived from creating goodwill from stakeholders, referred to as stakeholder theory (Demacarty, 2009). Stakeholder management focuses on the interests of constituencies that are affected, or affect, the corporation (Freeman, 1984). By identifying stakeholders, analyzing relationships with them and evaluating these relationships, firms are able to successfully operate in their public and strategic environments. The analysis and evaluation of stakeholder relationships enables firms to determine which parties deserve or require attention from management, resulting in optimization of relationships and preservation of corporate legitimacy (Doh & Guay, 2006).

Jones (1995) put forward an operationalization of stakeholder theory that could offer instrumental value to management. In his instrumental stakeholder theory, he argues that firms that work on the basis of honest, trusting and ethical relationships will be rewarded by stakeholders in terms of positive reputation effects, making these firms suitable business partners. Applying this theory to CSR, Jones suggests that corporate responsible behavior corresponds to attempts to build honest, trusting and ethical relationships. By extension, firms that are high in CSP should benefit financially from their positive interaction with stakeholders. Paying attention to the domains of CSR improves the relations with the stakeholders that were identified, ultimately resulting in better overall performance (Waddock & Graves, 1997). Variations of this theme were introduced by: Waddock and Graves (1997), the good management theory; Cornell and Shapiro (1987), the social impact hypothesis; Freeman and Evan (1990, in Orlitzky et al., 2003), firm-as-contract analysis.

A noteworthy addition to the instrumental stakeholder theory was made when the resource-based view (RBV) logic was applied to this theory (Russo & Fouts, 1997; Surroca et al., 2010). Where Jones (1995) explicitly mentioned the benefits of creating goodwill from stakeholders, instrumental stakeholder management may also result in other benefits. Applying the RBV logic, theorists argue that the reputational effect of CSR and internal effects of CSR actions on, for instance, technology, HR capital, and other firm assets, can all be at the root of increasing a firm's competitive advantage, explaining the subsequent financial performance (Orlitzky et al., 2003) (see also section 2.3).

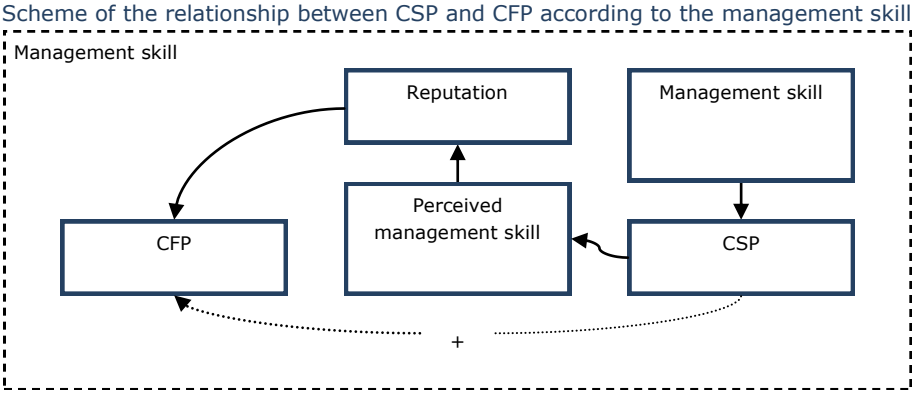
Figure 1
Relationship between CSP and CFP according to the instrumental stakeholder theory and the resource-based view.



Management skill

A different notion that relates CSP to CFP in a positive way can be referred to as management skill. It states that management that is able to perform in the social responsibility domain will be perceived as having the skills to perform equally adequate in other domains, including the financial domain (Alexander & Buchholz, 1978). In this assumption, CSP functions as an indicator of management skill. The mechanism at work here is based on reputation effects; an increase in perceived CSR positively influences the firm's reputation, resulting in the possibility for management to exchange explicit claims for less costly implicit claims (McGuire et al., 1988). This mechanism, or idea, was named the social impact theory by Preston & O'Bannon (1997). They linked the mechanism to stakeholder theory; however, it must be noted that in this theory the idea of building relationships, as described in instrumental stakeholder theory, are replaced for a simpler notion of meeting stakeholder claims.

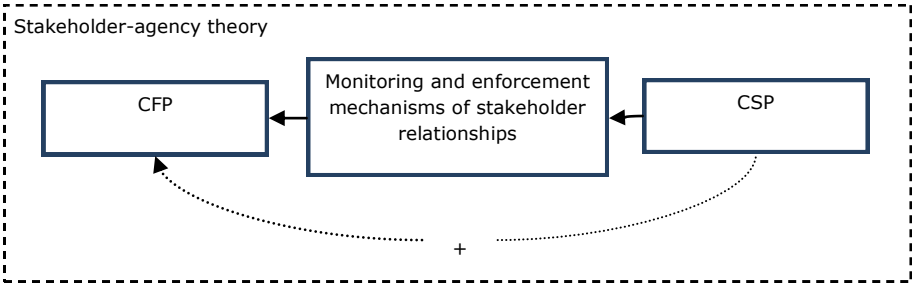
Figure 2
Scheme of the relationship between CSP and CFP according to the management skill assumption.



Stakeholder-agency theory

Orlitzky et al. (2003) use the principles of agency theory to build a positive relation from CSP to CFP (for negative relations between CSP and CFP based on agency theory, please refer to the descriptions of trade-off theory and the managerial opportunism hypothesis). In the article it is stated that the relationships build with stakeholders serve as monitoring and enforcement mechanisms that prevent managers to lose sight of broad, financial organizational goals. Negotiation and contracting processes with stakeholders, based upon a reciprocal, bilateral basis, prevent mangers to drift away from organizational goals and, in that way, lead to a reduction in agency costs resulting in a positive relationship between CSP and CFP.

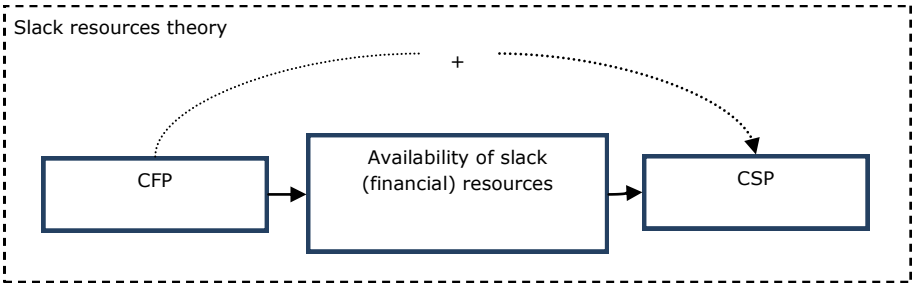
Figure 3
Scheme of the relationship between CSP and CFP according to stakeholder-agency theory.



Slack resources theory

Slack resources theory states that there is a positive relation between CSP and CFP. However, compared to instrumental stakeholder theory, this theory proposes a different direction of causation. Slack resources theorists argue that firms with better financial performance will have resources available to invest in CSR. Since these resources, financial and other, are necessary to improve CSP, a link between the two is expected. In this line of reasoning, better CFP will result in better CSP (Waddock and Graves, 1997). In other words: all firms may want to excel in CSR but only those with sufficient resources will find themselves performing well (O'Bannon and Preston, 1997). McGuire et al. (1988) add to this discussion by stating that CSR is an area of high managerial discretion, making it more likely that CSP will depend on available resources.

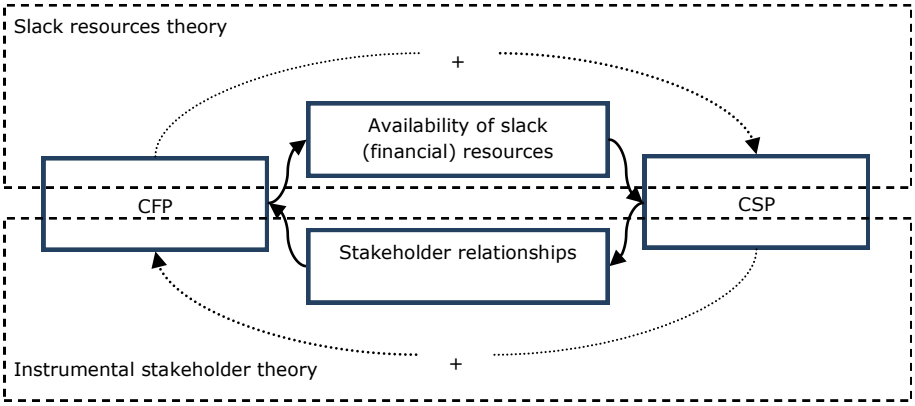
Figure 4
Scheme of the relationship between CFP and CSP according to slack resources theory.



Virtuous cycle

Waddock and Graves (1997) introduced a positive, synergistic relation between CSP and CFP. They argue that CSP is a predictor of CFP and a result of CFP. The last notion is based on slack resources theory (see above). Companies that have slack resources at their disposal, and allocate these resources in the social domain, are expected to increase CSP. Here, an increase in financial performance is a predictor of an increase in social performance. Based on good management theory (see above), the authors expect a similar, positive relationship in the other causal direction: CSP is a predictor of CFP. The mechanism at work is stakeholder relationships. Investments in the social domain are expected to result in improved relationships, resulting in overall better performance (figure 5, next page).

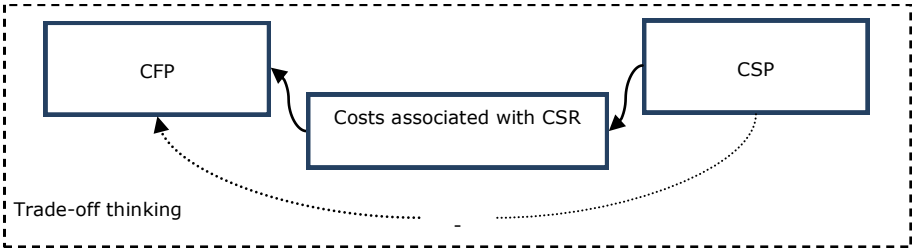
Figure 5
Scheme of the relationship between CFP and CSP according to the virtuous cycle.



Trade-off thinking

Proponents of this line of reasoning believe that firms have to choose between CSP and CFP. Those firms that chose to invest in the CSP domain face costs that firms that stay away from these investments do not face. Since investments in CSR are expected to result in corporate social performance, firms that perform well in terms of social responsibility are at a disadvantage compared to firms that do not invest in these types of actions. It is this trade-off between the two concepts that is at the core of an expected negative relation between CSP and CFP (e.g. Aupperle et al., 1985; McGuire et al., 1988; O'Bannon and Preston, 1997). This theory finds its roots in the classical work of Friedman (1970) on CSR. The costs of CSR are expected to be higher than the potential benefits (if any at all). Such investments are not in line with the principle of shareholder wealth maximization. Additionally, theorists in this direction of reasoning state that managers are unable to determine what the exact responsibilities of a firm are (Bauer et al., 2005). The disagreement between shareholder interests and management actions, and the resulting costs to shareholders, is rooted in agency theory. Friedman (1970) argued that investments in CSR boil down to a betrayal of shareowner trust, based on an expected negative relation between CSP and CFP that might result in reduced shareowner welfare.

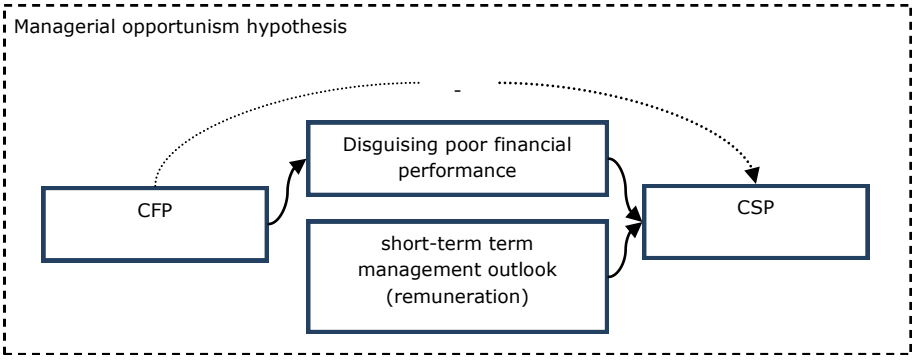
Figure 6
Scheme of the relationship between CSP and CFP according to trade-off theory.



Managerial opportunism hypothesis

The negative association set forth in the managerial opportunism hypothesis is founded in agency theory, however, unlike in the trade-off theory (described above) O'Bannon and Preston (1997) expect a negative relationship from CFP to CSP. This is expected because managers pursue private goals, for instance benefitting from remuneration schemes, which are linked to short-term financial performance. These managers are less likely to invest in CSR because these investments will not pay off in the short-term and would endanger manager compensation. The temptation here, and the link between CFP and CSP, is cashing in by reducing CSR investments. A second reason for the negative association is that when managers are faced with poor financial performance they may want to disguise or justify this performance by means of excessive investments in CSR. Goss and Roberts (2009) reason in a similar way: managers that want to polish their reputations may do so at the expense of shareholders. Both management actions may explain why negative financial performance may result in improved attention to the social domain.

Figure 7
Scheme of the relationship between CFP and CSP according to the managerial opportunism hypothesis.



Vicious cycle

Next to a positive cycle that links CSP tot CFP (the virtuous cycle), a negative synergistic relationship must be considered too (a vicious cycle). It is possible that such a vicious cycle exists in reality (O'Bannon & Preston, 1997), however, in literature on the link between CSP and CFP such a relationship has not been specified in a theory.

The inverted 'U'

According to some theorists, the relationship between CSP and CFP is not linear. Rather, there is relationship between the two variables in the form of an inverted 'U': a curvilinear relationship. This implies a single, optimal level of CSR and also that any deviations from this level will result in lower levels of financial performance (Salzmann et al., 2005; Lankoski, 2009; Barnett and Salomon, 2006).

2.1.2 Empirical findings

The discussed theories have been subject to empirical testing in many studies. Examining this body of research through meta-analysis, Margolis et al. (2007) concluded that there is a small, positive association between CSP and CFP, a result previously found in other meta-analyses (Orlitzky et al. 2003; Margolis and Walsh, 2003).

In their review, Margolis et al. (2007) included studies that satisfied two conditions: CSP and CFP were measured on the firm level, and an effect size for the association between CSP and CFP was provided. Based on these criteria and a thorough literature review, 167 studies were identified. As mentioned previously, within the body of literature many different indicators of CSP were used. In this meta-analysis, these indicators were divided into single dimensions of CSP (charitable contributions, corporate policies, environmental performance, revealed misdeeds and transparency) and broad appraisals (self-reported social performance, observers' perceptions, third-party audits, and screened mutual funds).

The analysis resulted in finding a positive relationship between CSP and CFP (with an overall average effect of $r = 0.132$). Although the result is statistically significant, it is small. Based on their results, Margolis et al. (2007) conclude that the financial impact of CSP is, at the least, neutral. This conclusion contradicts the concerns of those theorizing about a negative relationship (e.g. Friedman, 1970). Only in 2 percent of the analyzed studies a significant negative association was detected. However, the small effect size indicates that, although CSP is not detrimental for CFP, it is not very beneficial to CFP either.

Orlitzky et al. (2005) come to a similar conclusion when reviewing research up to that point. They conclude that there is no trade-off between CFP and CSP. This conclusion is based on the correlations they find between CSP and subsequent CFP ($r = 0.288$), CFP and subsequent CSP ($r = 0.294$), and CSP and CFP measured in the same period ($r = 0.440$).

The theory that received most attention in research is instrumental stakeholder theory. Here, empirical findings from research that combines instrumental stakeholder theory and slack resources theory is of most interest; the theoretical framework of this research is based on these two theories that, together, form a virtuous cycle (see section 2.3 Hypotheses).

Waddock and Graves (1997) found first empirical evidence for the virtuous cycle of corporate social responsibility. In their research, corporate social performance was significantly related to subsequent corporate financial performance, and corporate financial performance was significantly related to corporate social performance. Based on the evidence, the authors conclude that corporate social performance may cause financial performance and, in its turn, social performance may cause financial performance.

Surroca et al. (2010) expanded on the virtuous cycle proposed by Waddock and Graves (1997) with the resource-based view. The authors expected that intangible assets moderate the relationship between corporate social performance and corporate financial performance, and vice versa. Their results support this line of reasoning; an increase in in of the two measures of performance will always results in an increase in the other, if new intangibles are developed. Again, providing significant evidence for the virtuous cycle.

2.1.3 Methodological issues

The previously mentioned meta-analysis studies not only try to combine data in order to conclude about the relation between CSP and CFP, additionally various differences in the extant research into this link are mentioned. Margolis et al. (2007) found, among other things, differences in the operationalization of CSP and CFP, the order of measuring the variables and thus the direction of causation, and the control variables used. Orlitzky et al. (2003) also point out differences in measurement strategy and time order.

Direction of causation

In their meta-analysis of the body of research on the CSP-CFP link, Margolis et al. (2007) found evidence of a small, positive relation from CSP to CFP. Additionally, they found evidence that the link is at least as strong, if not stronger, from CFP to CSP (as was previously reported by Orlitzky et al. (2003)). The authors point out that although these findings have been reported before, and theories that link CFP to CSP exist, there has been little research into this direction of causation. Especially the mechanisms, that explain how companies that perform well in terms of financial performance consequently perform well in the social responsibility domain, have gone overlooked.

Measuring the variables

Based on the results of their meta-analysis, Margolis et al. (2007) argue that the difference in measures of CSP explains the differences in the strength of the relationship between CSP and CFP that are found by various researchers. Peloza (2009) researched the tools and metrics used to quantify the financial impacts of CSR. The author identified 39 measures of CSP in existing research; these were then classified into social, environmental and broad CSR. A similar amount of CFP measures was found, these were classified into: end state outcome metrics (market, accounting, and perceptual based), intermediate outcome metrics (cost, revenue, and integrative based), and mediating metrics (input/output, employee, innovation, and reputation based). After discussing (dis)advantages of the individual measures, the author argues that due to the inconsistency of measures used, it is difficult to identify a relationship between CSR and CFP.

Griffin and Mahon (1997) also identified several issues that complicate interpretations of existing research. The authors argue that a single measure of financial performance is insufficient and, in addition, that accounting measures are preferred since they are less noisy (see also López et al., 2007). Single-year measurements have several disadvantages: they can be susceptible to peaks in corporate performance, influencing the results of the relationship identified; and investments in CSR do not pay of immediately. Therefore, basing CSP and CFP scores on averages of longer time periods seems to be a better way of measuring corporate performance. Also, many studies use a single measure of CSP, where a more comprehensive measure, a metric, of CSP is preferable.

Control variables

Control variables are variables that affect the variable of interest, the dependent variable, but are not part of the relationship studied. In research on the link between CSP and CFP many control variables have been introduced, all for different reasons. Margolis et al. (2007) discuss the most common: firm size, risk and industry. The authors state, however, that more control variables should be included in research into the CSP-CFP link.

2.1.4 Conclusion

Since the beginning of the debate on CSR, and on the link between CSP and CFP, many theories and ideas were introduced and tested. The debate centered on the potential negative or positive financial impact of CSR on CFP. Theories that predict negative and positive relations between CSP and CFP were introduced. In the course of time, scholars came to focus more on theories that predict a positive relationship. There are two reasons for this development: (1) the empirical evidence collected over the years pointed at a relationship between CSP and CFP which is at least neutral and perhaps (mildly) positive, and (2) the increasing popularity of corporate social responsibility across all lines and, consequently, companies' willingness to adopt the extra responsibility, makes comparing companies engaging in CSR with companies that do not difficult and redundant. It seems that Friedman's (1970) objections to CSR were invalidated and outdated.

Part of this shift towards theories that could explain a positive relationship is the hunt for mechanisms that can explain such a relation. Although it is hard to link the intangible concept of CSR to financial performance, theorists have succeeded, and some of these mechanisms have been put to the test and were validated. Especially the resource-based view offers great possibilities to link CSP to CFP in a time were almost all companies are, to some extent, actively pursuing social and environmental goals. In this line of thinking, CSR can act as a catalyst in the development of strategic resources that are at the basis of a company's competitive advantage.

Recent developments in theory and in empirical evidence, and the weight of the arguments for mechanisms that propose a positive link between CSR and CFP, suggest that there is indeed a positive link between the two concepts. This assumption will be the foundation of the research in this thesis. The theoretical framework will be based on the virtuous cycle proposed by Waddock and Graves (1997). The intuitive theoretical arguments for a positive link between corporate social performance and corporate financial performance (and vice versa) and the previous empirical evidence support the decision to base this research on such a virtuous cycle. Especially when complemented by the resource-based view, similar to the research of Surroca et al. (2010). Unfortunately, the measurement of CSP by means of the Dow Jones Sustainability Index makes it impossible to measure the proposed intangibles; though they are discussed in section 2.3 (hypotheses), they are not part of the theoretical framework and the statistical tests that arise from this framework.

To be able to distinguish from previous research, and add to the existing body of literature, when testing the theoretical framework, several issues have to be taken into consideration. First of all, it is necessary to develop a definition of CSR and CSP that is in line with the purpose of this study: determining the relation between CSP, based on CSR in the broadest sense, and CFP; based on this definition, a measurement of CSP and CFP in line with this goal has to be used. Additionally, these measurements are to be based on longer period of time. Secondly, based on findings of two meta-analyses, the relationship from CFP to CSP deserves to be taken into account. Thirdly, next to the controls suggested in the past, new control variables deserve exploration.

2.2 Theoretical concepts

Margolis et al. (2007) reviewed 167 studies into the link between CSP and CFP. One of the issues they identified in this body of work (see 2.1.3) is the many different ways in which CSR and CSP are conceptualized. Before conceptualization in this thesis, first an overview of the history of the concept of CSR will be provided[1]. The aim is to come to a conceptualization of CSR that is instrumental for the purpose of this research. It should be noted that the idea for this research took shape after becoming aware of the data available via the Dow Jones Sustainability Index; however, in conceptualizing CSR, the definition used by Dow Jones has not been used in any way and, therefore, reasons for any congruence must be sought elsewhere. Because CSP follows CSR, only after defining the first, it is possible to conceptualize CSP. The third construct important in this research is CFP, by reviewing extant research into the CSP-CFP link, it is attempted to give a conceptualization of CFP that is most suitable for this type of research.

2.2.1 Corporate social responsibility

The origins of the debate on CSR in academic writing is often claimed to be found in the articles of Berle (1931, in Okoye, 2009) and Dodd (1932, in Okoye, 2009). In these articles there was first mention of a second function of business, the social-service function, the first one being, of course, profit-making. Bowen (1953, in Carroll, 1999) was the first to talk about business' responsibilities to society and to put forth a definition of CSR: "*It refers to the obligation of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society*".

The debate continued in the 1960s, definitions of CSR came to include responsibilities beyond company's economic, technical and legal obligations; of interest were politics, community welfare, education, human resources, and the whole social system. Where the previous decade saw the first definition of CSR, the 1960s saw many attempts at defining CSR. The most important authors of the period were Davis, Frederick, McGuire and Walton (Carroll, 1999). Mathis (2008) considers definitions of CSR given by McGuire and Davis of importance because of their impact on later CSR developments. McGuire argues that business has responsibilities to society beyond economic and legal obligations. Davis (1960, in Mathis, 2008) recognized the growing power of business and considered the social impact of this power. Being a social institution, business should use power responsibly, he argued. In Davis' social power equation, greater power implies a greater responsibility to society. A second concept introduced by Davis is the 'iron law of responsibility', arguing that where business does not use its power, it will lose it (Davis 1960, 1967, in Okoye, 2009). Davis was also the first to introduce the linkage between social performance and financial performance (Carroll, 1999).

In the 1970s, CSR definitions, publications and concepts increased. In this decade, aspects of CSR that are still relevant today were introduced, e.g. stakeholder management (Johnson, 1971, in Carroll, 1999), environmental protection and discretion/voluntarism. Other developments were the search for social indicators and the elaboration of Davis' power arguments (Mathis, 2008). A milestone in the evolution of CSR definitions came from the Committee for Economic Development (CED, 1970 in Carroll, 1999), in response to observed changes in the social contract between business and society, a three concentric circles definition of CSR was introduced: "The inner circle included the clear-cut basic responsibilities for the efficient execution of the economic function – products, jobs and economic growth. The intermediate circle encompasses responsibility to exercise this economic function with a sensitive awareness of changing social values and priorities: for example, with respect to environmental conservation; hiring and relations with employees; and more rigorous expectations of customers for information, fair treatment, and protection from

[1] For a complete review of the history of the CSR concept, please refer to: Carroll, A.B. (1999). Corporate social responsibility: evolution of a definitional construct. Business & Society 38(3), 268-295.

injury. The outer circle outlines newly emerging and still amorphous responsibilities that business should assume to become more broadly involved in actively improving the social environment".

A very influential and often cited definition of CSR also saw light in the 1970s. Carroll (1979, in Carroll 1999) stated that: "The social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time". Since this definition, most scholars have recognized that a definition of CSR should include an economic aspect, and not only societal and environmental issues (Montiel, 2008). The definition is embedded in a conceptual model of corporate social performance, well known as 'Carroll's pyramid' (Mathis, 2008).

After the many definitions of the 1970s, in the 1980s developing the definition of CSR gave way to research into different aspects of CSR and alternative concepts. This trend continued in the 1990s resulting in the introduction of multiple themes and concepts (Carroll, 1999). These spin-off concepts include: corporate sustainability, 'business in society', corporate citizenship, corporate accountability, corporate responsibility, business (social) responsibility, sustainable business, the ethical corporation, etc. (e.g. Garriga and Mele, 2004; Montiel, 2008; Zu, 2009).

The evolution of the definition of CSR, and of concepts originating from CSR, is impressive. The key is to identify if all these definitions and concepts are different or simply different ways to refer to the same idea. Dahlsrud (2006) identifies five dimensions of CSR: the environmental, economic, social, stakeholder, and voluntariness dimension. Based on these dimensions, he analyzed 37 definitions of CSR put forward in the period between 1980 and 2003. He concludes that all definitions constantly refer to the five dimensions, albeit in different terms. Consequently, the problem of a lacking universal definition of CSR does not seem to be so troubling.

One of the concepts related to CSR that has accumulated a lot of attention recently is corporate sustainability (CS). CS was defined by the WCED (1987) as: "Sustainability development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Van Marrewijk and Were (2003) define corporate sustainability as: "Corporate sustainability … refers to a company's activities – voluntary by definition – demonstrating the inclusion of social and environmental concerns in business operations and in interactions with stakeholders". Interestingly, they argue that this definition not only applies to corporate sustainability but also to CSR. Montiel (2008) systematically reviewed definitions of CSR and CS used in literature. He identified many points of overlap between the two constructs and sees possibilities to integrate the concepts. In a similar effort, Fauzi et al. (2010) examine the concepts of sustainability, CSR and Triple Bottom Line (TBL). They conclude that for all three concepts, corporations have a discretionary responsibility in the financial, social, and environmental domain.

Based upon the historical development of CSR, its spin-off concepts, and the apparent congruence between the definitions and concepts that were introduced during the last 60 or so years, it is concluded that any CSR definition should be formulated based upon the relationship a company has with its stakeholders in the economic, societal, and environmental dimension, and the direct relationship of a company with society and the environment at large.

Based on this conclusion, the following conceptualization of CSR is used in this paper:

Corporate social responsibility (CSR) refers to a company's actions to include the interests of its stakeholders in the economic, social and environmental domain in its business operations, and to a company's actions aimed at guaranteeing the continued existence, at least at an equal level, of the company, society and the environment at large.

2.2.2 Corporate social performance

The concept of corporate social performance was introduced by Wood (1991), initially defining it as: "a business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's societal relationships". Based on the importance of stakeholders (they set the norm for CSR, experience the effects and evaluate corporate social behavior), this definition was adjusted by Wood and Jones (1995); policies, programs, and outcomes were redefined as "internal stakeholder effects, external stakeholder effects, and external institutional effects".

In literature on the relation between CSP and CFP, researchers have defined CSP in two ways: (1) as a multidimensional construct (that is either constructed by examining companies' efforts of living up to multiple responsibilities, or by looking at a company's principles, processes, practices and outcomes) or (2) as a function of how stakeholders are treated by a company. Efforts have been made to discriminate between the concepts of CSR and CSP, however in literature these concepts are often used interchangeably (Margolis et al., 2007).

For the purpose of this thesis, CSP is regarded as the outcome of a company's CSR actions, much in line with the definition of Wood (1991). CSP is not regarded as a concept comparable to CSR, additional to CSR, or in any way related to CSR other than as a consequence of CSR. Therefore, the concept is defined in line with CSR:

Corporate social performance (CSP) refers to the extent to which a company is successfully able to implement the interests of its stakeholders, in the economic, social and environmental domain in its business operations, and the extent to which a company is successfully able to implement actions aimed at guaranteeing the continued existence at least at an equal level, of the company, society and the environment at large.

2.2.3 Corporate financial performance

Corporate performance refers to the outcomes of management processes in relation to the goals that were set. It is the ability of the organization to use its resources efficiently and effective in order to reach those goals. Corporate performance can be divided into two categories: operational performance and financial performance. Operational performance contains measurements like market share, marketing effectiveness and product quality. Financial performance can be split up, once more, into market-based performance and accounting based performance. The first referring to, for example, earnings per share and stock prices, the latter includes return on assets and return on equity (Fauzi et al., 2010).

The concept of corporate performance depends heavily on the purpose of measuring it. For instance, customers will rate corporate performance in operational terms: product quality, affordability, service level, etc. In the financial markets, people are more likely to consider financial indicators, the market-based performance. Even corporate sustainability performance in itself is considered by many. Internally, companies will try to balance these aspects of corporate performance (Fauzi et al., 2010).

This research focuses on financial performance. It addresses the area of tension between CSR and shareholder interests. Because these interest are mostly based on financial corporate outcomes, in this thesis, as in other research on the CSR-CFP link, corporate financial performance will be defined in financial terms. The definition is set accordingly:

Corporate financial performance (CFP) refers to the financial outcomes of business operations.

2.3 Hypotheses

Based on the literature review, hypotheses that will be tested in this research are developed. The hypotheses are built on instrumental stakeholder theory (Jones, 1995) and the slack resources theory (Waddock & Graves, 1997). The link between CSP and CFP is grounded in RBV logic (Surroca et al., 2010). It is expected that there is a 'virtuous cycle' between the two concepts (Waddock & Graves, 1997; Surroca et al., 2010). However, several variables are believed to influence the relationships in this cycle and are, therefore, controlled, these are: size, risk attitude, type of industry and institutional context.

The design of the research, i.e. using the Dow Jones Sustainability Index (see section 3.2), does not allow for measurement of the intangible assets put forward in the resource-based view. However, before coming to the final theoretical framework, the resources-based view in combination with instrumental stakeholder theory and slack resources theory will be addressed. The role of control variables is also addressed. After discussing the theories, two figures are introduced that summarize the relationship between CSP and CFP; figure 8 includes the resources-based view, and figure 9, the theoretical framework of this research, does not due to limitations in the data.

2.3.1 Slack resources theory and RBV

The resource-based view states that a firm's competitive advantage is rooted in the application of valuable resources that are difficult to obtain and hard to imitate and/or substitute (Barney, 1991). Surroca et al. (2010) propose a theoretical framework in which intangible resources, often seen as the basis for competitive advantage, mediate in the relationship between CSP and CFP. The link between CFP and CSP is rooted in the resource-based view. The effects of financial performance on four intangible resources (reputation, organizational culture, human capital and innovation) explain the positive relation between CFP and CSP. The mechanisms that are proposed to explain this positive relationship, in this combination of slack resources theory and the RBV, are discussed below.

Reputation

CFP improves a firm's reputation; it indicates that management is capable of resource allocation, building an effective strategy, and overall management (Surroca et al., 2010). These positive impacts on reputation may affect stakeholder relations; stakeholders are more likely to build relationships with corporations that have shown to be able to be successful. As a result, these relationships will become closer and CSP will increase (Surroca et al., 2010).

Innovation

McWilliams and Siegel (2000) suggest that a firm may improve its CSP by investments in product or process innovation. Product innovation is directly related to marketing responsible products, process innovation allows firms to produce in more environmentally friendly ways (e.g. waste and energy reduction). Since the external financing of such innovations is often difficult, they are often internally financed. Firms with more internal financial resources are in a better position to finance this investment, resulting in improved CSP (Surroca et al., 2010).

Human capital

Companies with slack resources are more likely to implement commitment-based HR policies. These policies positively influence employees. The relationship a company has with its employees is an important part of CSR. The implementation of these HR policies, for instance through employee training, empowerment, collaboration, and profit sharing schemes, will positively affect the relationship between a firm and its employees, resulting in increased CSP (Surroca et al., 2010).

Organizational culture

Financial success enables companies to build a culture where employee satisfaction and external relationship are central. In such a culture, commitment, trust, harmony, and a good working climate are promoted, this in turn affects the relations with stakeholders, resulting in satisfying the interests and expectations of multiple stakeholders. Increased CSP is the outcome (Surroca et al., 2010).

2.3.2 Instrumental stakeholder theory and RBV

Similar to the discussion above, Surroca et al. (2010) expect a positive relation from corporate social performance to corporate financial performance. They suggest that CSP influences the same four intangible resources, resulting in competitive advantage and, consequently, financial performance. In this research, the link between CSP and CFP is built on the same reasoning for two reasons: (1) the mechanisms that link CSP to CFP proposed by different authors over the years are very often build around either reputational effects or intangible internal effects and (2) based on the RBV it is possible to compare companies that all engage in CSR but are not all equally successful. Below, the effects of corporate social performance on the four intangible resources and, therefore on competitive advantage and financial performance, as found in literature, are discussed. These mechanisms combine instrumental stakeholder theory and the RBV.

Reputation

A negative reputation, due to failure of meeting stakeholder expectations, may result in market fears, which will increase a company's risk premium and result in higher costs and/or missed opportunities (Cornell & Shapiro, 1987). Likewise, environmental misconduct can result in costly penalties and negative reactions, affecting a firm's default risk (Bauer & Hann, 2010). High CSP can be interpreted as the ability to meet stakeholder expectations resulting in positive reputational effects and consequently the ensured participation of stakeholders in corporate activities (Surroca et al., 2010). Additionally, a good corporate reputation may result in improved CFP via employee attraction; improved contract negotiation position during external financing; and customer loyalty (e.g. Lev et al., 2010; Surroca et al., 2010). McGuire et al. (1988) argue that improved reputation can result in the possibility to exchange costly explicit claims for less costly implicit claims, positively impacting on CFP. Russo and Fouts (1997) conclude that a positive reputation is itself a valuable, inimitable resource.

Innovation

The ability to innovate can be a source of competitive advantage, such ability is often difficult to develop, hard to copy and replace (Russo & Fouts, 1997). CSR can act as a source of innovation: the development of new environment friendly products; process innovations stemming from initiatives to, for example, reduce waste or to reduce energy consumption (Surroca et al., 2010).

Human capital

CSR is also positively linked to human capital, which can act as a resource on which competitive advantage can be build. Several mechanisms that link CSR to CFP via human resources are offered: Surroca et al. (2010) argue that firms high in CSP attract better employees and retain them longer, reducing turnover; CSP is suggested to have a positive impact on employee morale (e.g. Surroca et al., 2010); CSP can improve employee productivity, morale, and satisfaction (McGuire, 1988); through CSR policies, employees learn about customer needs (Demacarty, 2009); a CSR firm has loyal employees that are proud of the superior value offered to customers (Demacarty, 2009); empowered employees have more control over their work and have higher levels of commitment (Surroca et al., 2010).

Organizational culture

Russo and Fouts (1997) argue that a corporate culture rooted in CSR behavior enhances cross-functional integration across the organization, learning and commitment, employee skills, and the incorporation of high qualified employees. Taking social and environmental considerations into account, aids companies in developing a culture based on innovation, mutual trust with stakeholders, and collaborative relationships (Surroca et al., 2010). In these ways, CSR can help build a culture upon which a firm can base its competitive advantage.

2.3.3 Control variables

To address the relationship between CSP and CFP it is necessary to filter out variables that distort the picture. By introducing control variables in statistical testing, it is possible to determine the influence of CSP on CFP and vice versa without the effects of other variables on the dependent variable. These control variables are held constant. In the research on the CSP-CFP link three control variables have dominated: industry type, attitude towards risk and firm size. In this research, a fourth control variable is introduced: institutional context. These variables, and the reasons for controlling them, are discussed in more detail below.

Institutional context

A company's institutional context is introduced in this research as a new control variable. Differences in the structure of corporate governance are believed to influence the relationship between corporate social performance and corporate financial performance. In the research, two different institutional contexts will be taken into account: North America and Europe. Europe has a more network-oriented (Rhineland) system of corporate governance. Traditionally, companies have a responsibility towards multiple stakeholders, including customers, suppliers, employees and shareholders. However, the main responsibility is, in case of conflicting interests, of financial nature and towards shareholders. North American companies have a more market-oriented (Anglo-Saxon) system of corporate governance in which the shareholder always comes first. Companies have a responsibility towards these shareholders, the interests of other stakeholders are not so prominent (Habisch, 2005).

In Europe, these relationships between firms and stakeholders have been part of business for decades (Doh & Guay, 2006). Institutional variation in Europe and North America, where stakeholder interest are less prominent, results in different perceptions and implementations of corporate social responsibility in North America and Europe. In Europe corporate social responsibility is expected from firms to a greater extent than this is the case in North America (Doh and Guay, 2006; Danko et al., 2008; Campbell, 2007). European companies are therefore expected to engage in CSR regardless of slack resources and to dominate CSP when compared to their North American counterparts. In terms of financial performance, institutional context may also play a role. The markets companies are active in may depend on their institutional origins. Because these markets differ in their economic outlooks, varying financial results are to be expected.

Type of industry

Not unlike the institutional context, a company's type of industry may affect the way in which a company implements its CSR policy and the dimensions of CSR a company puts emphasis on. Because the internal- and external environment is different for every type of industry, every industry is faced with unique challenges in the economic, social and environmental domains. As was mentioned in the theoretical section, these individual domains of CSR may relate differently to CFP. The role and interests of stakeholders may differ, social and environmental challenges may differ, resulting in a difference in the relative importance of the separate dimensions of CSR, and, consequently, different relations between CSP and CFP for different industries (Godfrey & Hatch,

2007; Griffin & Mahon, 1997). Additionally, a company's industry of choice may also very well determine financial performance. Industries differ in terms of competitive rivalry, the division of powers of the various actors and the threat of substitute products and new entrants. These variations may cause companies active in different industries to perform different in terms of finances.

Size

Size is often seen as a determinant of CSP. Artiach et al. (2010) report three reasons: (1) larger companies are more visible and therefore attract more attention from stakeholders, resulting in an increased need to consider stakeholder claims; (2) bigger companies leave a larger impression on their worlds, resulting in more thorough assessments of their activities; and (3) size may result in economies of scale in the implementation of CSR activities. These three factors (visibility, scrutiny and economies of scale) explain why bigger companies tend to perform better in terms of corporate social responsibility. To address the relation between CFP and CSP, it is important to factor out the influence of firm size on CSP. Secondly, firm size could also affect financial returns. Again, economies of scale can make it possible for larger firms to perform better financially when faced with the same challenges as smaller firms.

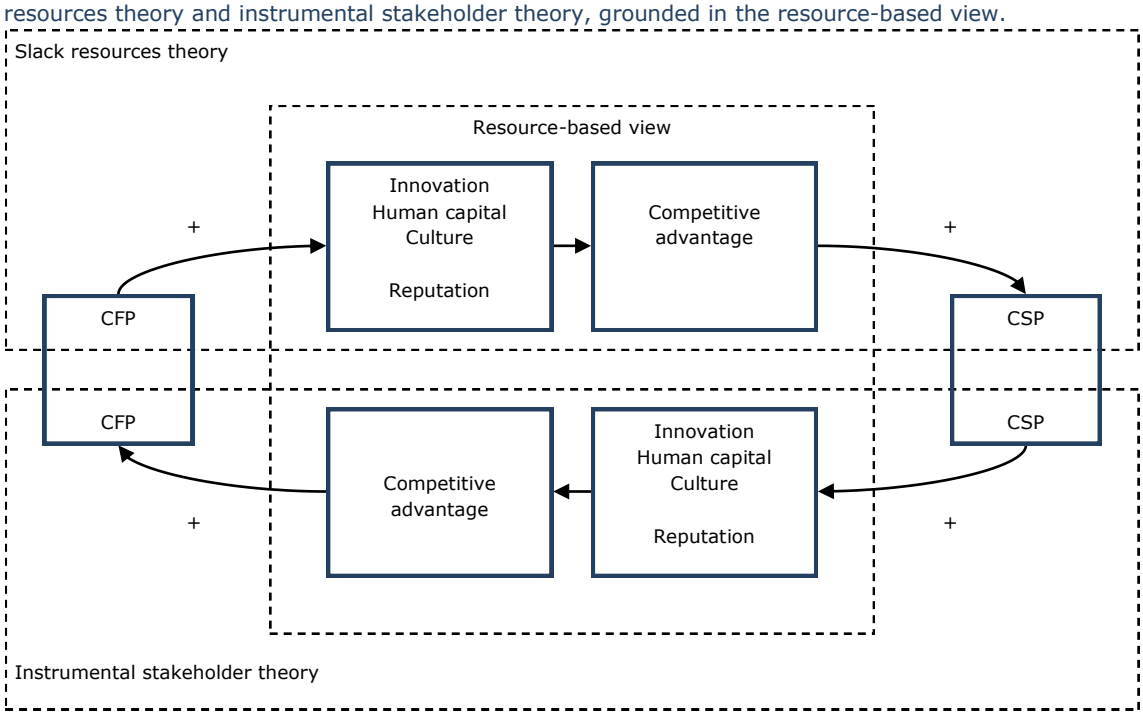
Risk

Margolis et al. (2007) sum up reasons for controlling firms risk attitudes when testing the relation between CSP and CFP. First of all, in general it is the more stable firm that is likely to engage in CSP and, secondly, a company's risk profile is strongly related to its financial returns. For these reasons, firms' attitude towards risk is controlled for when studying the relationship between CSP and CFP.

2.3.4 Hypotheses

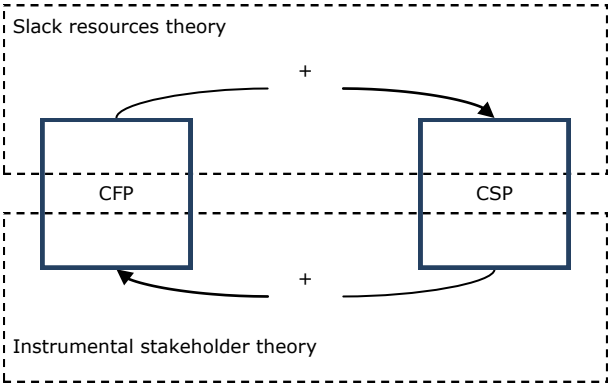
Based on the discussion above, the following scheme represents the relationships identified in theory.

Figure 8
The relationship between corporate financial performance and corporate social performance according to slack resources theory and instrumental stakeholder theory, grounded in the resource-based view.



The design of the research, i.e. using the Dow Jones Sustainability Index (see section 3.2), does not allow for measurement of the intangible assets put forward in the above scheme. Taking into consideration the absence of these data on the four intangible assets, the following theoretical framework is used.

Figure 9
Theoretical framework.



Based on this framework, that includes instrumental stakeholder theory (Jones, 1995) and slack resources theory (Waddock & Graves, 1997), the following hypotheses are developed:

Hypothesis 1: Better corporate financial performance results in better corporate social performance.

Hypothesis 2: Better corporate social performance results in better corporate financial performance.

3. Methodology

In this chapter, the research design of the thesis will be introduced, the concepts of CSP and CFP are operationalized and a description of the data selection process is given.

3.1 Research design

In identifying a link between CSP and CFP, researchers have studied different time frames and applied several methods (McWilliams & Siegel, 2000). Some study the short-term impact of CSP on financial performance, often by means of an event study methodology; others study the long-term impact, often by means of accounting or financial measures of profitability and a broad measure of CSR (CSP) (Zu, 2009). Both methods have disadvantages: abnormal returns found in event studies may result from events not under study and not controlled for (McWilliams & Siegel, 1997); taking a broad measure of CSR may result in subjectivity (Cochran & Wood, 1984).

In this study, the research will be based on a longitudinal design. Several points in time and long-term effects of both CSP and CFP will be considered. By using an index of sustainability performance, the Dow Jones Sustainability Index (DJSI), a broad measure of CSP is applied (see operationalization, 3.2). The disadvantage of such a broad measure of CSR, subjectivity, is limited in this case because the DJSI is based on assessment by experts, the criteria used for the index are continuously updated and the results are validated independently. Additionally, using the DSJI results in a large potential sample size, each year 230 firms are included in the index.

To overcome problems of time limitations, and causal direction, the design will be centered around three different time periods of three years. Period 1 from 2002 to 2004, period 2 from 2005 to 2007 and period 3 from 2008 to 2010. CSP will be determined by examining the index between 2005 and 2007 (period 2), resulting in a list of firms that have consistently scored high on CSP and a list of firms that did not. CFP will be determined for the time period 2002-2004 (period 1) in order to study the relationship via the CFP-to-CSP causal link. And CFP will be determined for 2008-2010 (period 3) to determine the influence of CSP on CFP, the other causal direction. By examining both CSP and CFP over longer periods of time, a consistent score is determined that factors out short-term financial fluctuations and peaks in CSP. Additionally, several control variables are introduced in the relationship (see 2.3.3 and 3.2). Figure 10 gives a graphical representation of the design.

Figure 10
Time periods and causal linkages studied.

To test these two relationships, two types of multiple regression analysis are used in this research. First, binary logistic regression is used to measure the relationship put forward in hypothesis 1; better corporate financial performance (2002-2004) results in better corporate social performance (2005-2007). Several control variables are introduced; these variables are believed to influence the relationship between CFP and CSP. Test results show: if the proposed model for CSP does a better job in predicting CSP than using the mean CSP value; if the individual predictor variables make a significant contribution to the model; and the strength of the influence of the predictor variable CFP on CSP, while holding the other variables constant.

In testing hypothesis 1, corporate social performance in period 2 is regressed against corporate financial performance in period 1. Three different models are used. Model 1a includes both measures of the control variable firm size (total assets and total sales), model 1b only includes total assets and model 1c total sales. Combining CFP, measured as return on assets, return on sales and return on equity, with control variables size, risk, industry and institutional context, results in the following models:

Model 1a:
$\text{Logit}(p_{CSP2}) = \beta_0 + \beta_1 CFP_{ROA1} + \beta_2 CFP_{ROS1} + \beta_3 CFP_{ROE1} + \beta_4 SIZE_{TA1} + \beta_5 SIZE_{TS1} + \beta_6 RISK1 + \beta_7 IND + \beta_8 IC$
(CSP = ROA1 + ROS1 + ROE1 + TA1 + TS1 + RISK + IND + IC)

Model 1b:
$\text{Logit}(p_{CSP2}) = \beta_0 + \beta_1 CFP_{ROA1} + \beta_2 CFP_{ROS1} + \beta_3 CFP_{ROE1} + \beta_4 SIZE_{TA1} + \beta_5 RISK1 + \beta_6 IND + \beta_7 IC$
(CSP = ROA1 + ROS1 + ROE1 + TA1 + RISK1 + IND + IC)

Model 1c:
$\text{Logit}(p_{CSP2}) = \beta_0 + \beta_1 CFP_{ROA1} + \beta_2 CFP_{ROS1} + \beta_3 CFP_{ROE1} + \beta_4 SIZE_{TS1} + \beta_5 RISK + \beta_6 IND + \beta_7 IC$
(CSP = ROA1 + ROS1 + ROE1 + TS1 + RISK1 + IND + IC)

To test hypothesis 2, better corporate social performance results in better corporate financial performance, multiple linear regression is used. It models the strength of the relationship between financial performance (the outcome variable) and social performance (the predictor variable). Several control variables are introduced; these variables are predicted to influence the relationship between CFP and CSP. The test results show if the proposed model for CFP does a better job in predicting CFP than using the mean CFP values; if the individual predictor variables make a significant contribution to the model; and the strength of the influence of the predictor variables on CFP, while holding the other variables constant.

Due to the three different measures of the outcome variable CFP (return on assets, return on sales and return on equity), three models are used:

Model 2.1: $CFP_{ROA3} = \beta_0 + \beta_1 CSP2 + \beta_2 SIZE_{TA2} + \beta_3 SIZE_{TS2} + \beta_4 RISK2 + \beta_5 IND + \beta_6 IC$
(ROA3 = CSP2 + TA2 + TS2 + RISK2 + IND + IC)

Model 2.2: $CFP_{ROS3} = \beta_0 + \beta_1 CSP2 + \beta_2 SIZE_{TA2} + \beta_3 SIZE_{TS2} + \beta_4 RISK2 + \beta_5 IND + \beta_6 IC$
(ROS3 = CSP2 + TA2 + TS2 + RISK2 + IND + IC)

Model 2.3: $CFP_{ROE3} = \beta_0 + \beta_1 CSP2 + \beta_2 SIZE_{TA2} + \beta_3 SIZE_{TS2} + \beta_4 RISK2 + \beta_5 IND + \beta_6 IC$
(ROE3 = CSP2 + TA2 + TS2 + RISK2 + IND + IC)

3.2 Operationalization

In this section the concepts of CSP and CFP will be operationalized. The concepts were formulated based on theory and historical developments, the operationalization will translate these concepts to the empirical world, in order to come to measurable variables. Additionally, the control variables will be operationalized according to prior academic research.

Corporate social performance

CSP was defined as: "*The extent to which a company is successfully able to implement the interests of its stakeholders, in the economic, social and environmental domain in its business operations, and the extent to which a company is successfully able to implement actions aimed at guaranteeing the continued existence at least at an equal level, of the company, society and the environment at large*".

To measure this extent, the Dow Jones Sustainability Index will be used. The Dow Jones sustainability indices track the financial performance of the leading sustainability-driven companies worldwide. Dow Jones provides several different indices, compiling firms from all over the world, Europe, the Euro zone, North America, the United States, Asia Pacific and Korea. The indices are the result of cooperation between Dow Jones Indexes and the SAM group (Germany, member of the ROBECO group). The indices are developed to provide asset managers with reliable and objective benchmarks to manage sustainability portfolios. Dow Jones (2011) describes corporate sustainability as: "*Corporate Sustainability is a business approach to create long-term shareholder value by embracing opportunities and managing risks deriving from economic, environmental and social developments. Corporate sustainability leaders harness the market's potential for sustainability products and services while at the same time successfully reducing and avoiding sustainability costs and risks*."

To be able to score companies on their social performance, Down Jones invites the world's 2500 biggest companies to participate in a CSR assessment on a yearly basis. Participating companies fill out a questionnaire. Results from these questionnaires are compared with a media- and stakeholder analysis performed by the SAM group and completed with data from secondary sources (company websites, annual reports, etc.). The assessment is based on general and industry specific sustainability criteria. The sustainability criteria are identified through the assessment of economic, environmental and social driving forces and trends. The criteria are selected on widely accepted standards, best practices, audit procedures and input from industry specialist and consultants. The criteria are:

Economic
- Codes of conduct / compliance / corruption and bribery
- Corporate governance
- Risk and crisis management
- Industry specific criteria

Environment
- Environmental reporting
- Industry specific criteria

Social
- Corporate citizenship / philanthropy
- Labor practice indicators
- Human capital development
- Social reporting
- Talent attraction and retention
- Industry specific criteria

Based on the questionnaires, media and stakeholder assessment and secondary information, each participating company is assigned a sustainability score. The top performers (top 10% or 20%, depending on which index) qua sustainability are then selected into one of the Dow Jones sustainability indices, and their financial performance is tracked. The validity of the assessment process and the final scores is independently verified by PWC.

In this thesis, CSP is operationalized as (not) being included in the Dow Jones Sustainability World Index. Operationalizing the concept in this way offers several advantages: (1) by applying industry specific criteria, Dow Jones is able to rank top performers per industry class (a best in class approach); (2) the criteria applied by Dow Jones cover the definition used in this thesis, therefore the operationalization of CSP agrees with the definition of the concepts of CSR and CSP; (3) independent verification of the data by an independent party ensures the validity of the scores; and (4) the CSP scores are based on a thorough examination of a broad range of sources, by a company specialized in this type of assessment.

Corporate financial performance

CFP is operationalized through the measurement of three accounting variables: return on assets (ROA), return on equity (ROE) and return on sales (ROS). These variables are commonly used to measure financial performance (Cochran and Wood, 1984; Peloza, 2009). Accounting measures give a demonstration of how efficiently a firm uses its assets in the process of value creation (Peloza, 2009). Only accounting variables are included in the operationalization, not market variables, because accounting variables are less noisy and indicate what is actually happening in the firm (Lopez et al., 2007). Return on assets is used to measure how well a company can turn its assets into revenue, return on equity measures the return on ownership equity, and return on sales is used to determine the operating performance.

The three accounting variables are operationalized on the basis of information available in the Compustat database (Compustat global fundamentals data). Return on assets is calculated by dividing earnings before interest and taxes (EBIT) by total assets, return on sales is calculated by dividing earnings before interest and taxes by total sales, and return on equity is calculated by dividing net income by total stockholders' equity.

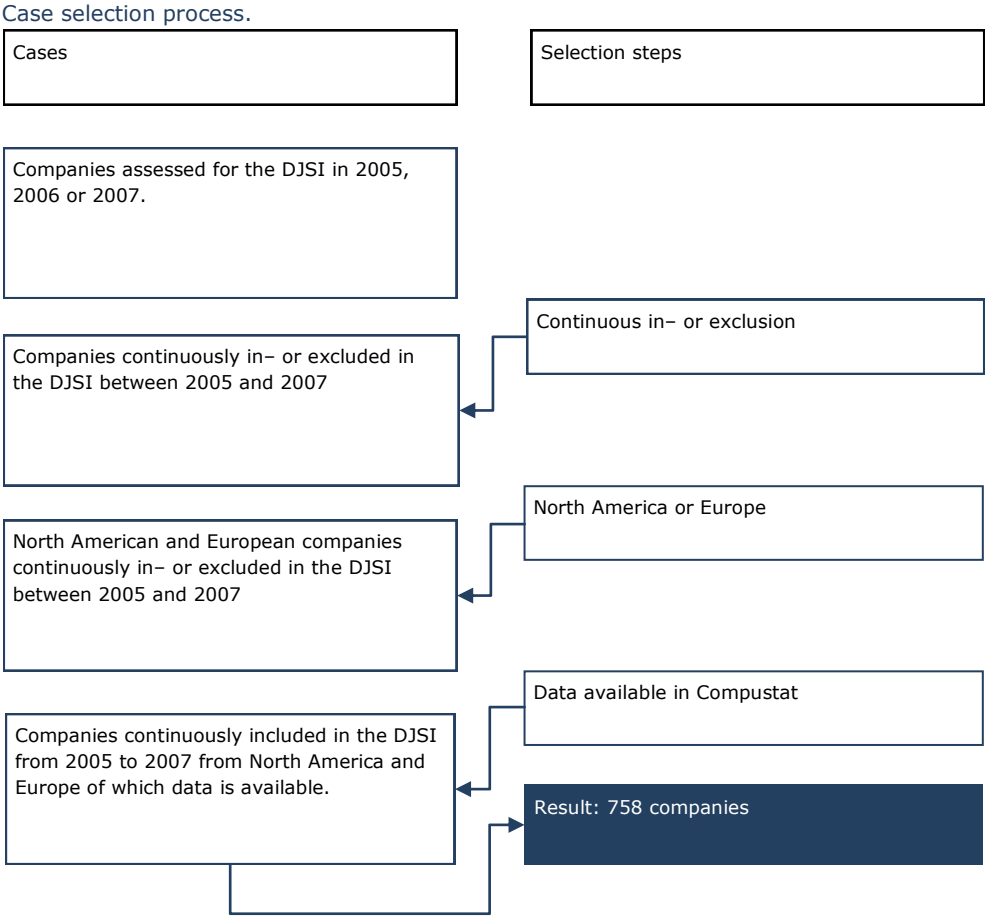
Control variables

The control variables, size, risk, and industry, are operationalized in accordance with previous research (Waddock & Graves, 1997). Firm size is measured by total assets and total sales, the firm's risk tolerance is measured by the total long-term debt to total assets ratio, and industry class is operationalized by categorizing companies in one of nine broad industry classes (basic materials, consumer goods, health care, industrial goods, services, technology, and utilities) based on the industry classes used by Dow Jones in their sustainability index.

3.3 Case selection

The DJSI is based on the Dow Jones Global Index, an index that that includes the world's biggest companies, 2500 in total. These 2500 are then invited to participate in the selection process for the DJSI. First, all companies that were continuously included in the DJSI between 2005 and 2007 (a total of three years) were identified. Secondly, all companies that were continuously not included were identified. All non-European and non-North American companies, included in the group created in steps one and two, were excluded. The list of companies that remained after these steps was then compared to the data available in the Compustat database. Companies of which not all (financial) data was available were excluded. Finally, a sample originated of companies from Europe or North America, continuously (not-)included in the DJSI between 2005 and 2007, and of which company data for the 2002-2010 period was available via Compustat. A total of 758 companies remained in the sample after the steps described above. More information about the data is available in chapter 4. An overview of the selection process can be found in figure 11.

Figure 11
Case selection process.



4. Data

In this chapter, an overview of the variables used in this research is provided and results from multivariate analyses are reported.

4.1 Data overview

When combined, the data available in the Dow Jones Sustainability Indices from 2005 to 2007 and in the Compustat database result in a sample of 758 companies. For all companies, data was collected on a number of different variables: return on assets, return on sales, return on equity, total assets, total sales, and risk tolerance. Additionally, several company characteristics were registered, namely: in-or exclusion in the Dow Jones Sustainability Index, industry type, and institutional context. A list of all these variables, a short explanation of the variables and their abbreviations as used in this thesis may be found in table 2.

Table 2
Descriptions of all variables used in this research.

Category	Variable	Short	Description
Qualitative	Corporate social performance	CSP	Variable that distinguishes firms on the basis of continuous in- or exclusion in the DJSI between 2005 and 2007. Values: 0 Excluded 1 Included
	Industry type	IND	Variable that represents a firm's broad industry class. Values: 1: Basic materials 2: Consumer goods 3: Health care 4: Industrial goods 5: Services 6: Technology 7: Utilities
	Institutional context	IC	Variable that represents a firm's institutional context. Values: 0 North America 1 Europe
Quantitative	Return on assets	ROA (1, 2, 3)	Variable that represents a firm's average return on assets for periods 1 (2002-2004), 2 (2005-2007), and 3 (2008-2010). Values are based on the following equation: ROA = earnings before interest and taxes / total assets
	Return on sales	ROS (1, 2, 3)	Variable that represents a firm's average return on sales for periods 1 (2002-2004), 2 (2005-2007), and 3 (2008-2010). Values are based on the following equation: ROS = earnings before interest and taxes / total sales
	Return on equity	ROE (1, 2, 3)	Variable that represents a firm's average return on equity for periods 1 (2002-2004), 2 (2005-2007), and 3 (2008-2010). Values are based on the following equation: ROE = net income / total assets
Size:	*Total assets*	ln TA (1, 2, 3)	Variable that represents a firm's average total assets for periods 1 (2002-2004), 2 (2005-2007), and 3 (2008-2010), after taking the natural logarithm of the original values.
	Total sales	ln TS (1, 2, 3)	Variable that represents a firm's average total sales for periods 1 (2002-2004), 2 (2005-2007), and 3 (2008-2010), after taking the natural logarithm of the original values.
	Risk tolerance	RISK	Variable that represents a firm's average risk for periods 1 (2002-2004), 2 (2005-2007), and 3 (2008-2010). Values are based on the following equation: RISK = total long term debt / total assets.

Before proceeding to the results of the statistical tests, an overview of the distribution of the sample on the categorical and qualitative variables is given in table 3 and table 4 respectively.

Table 3
Overview of the distribution of the categorical variables.

Variable	Short	Values	Counts
Corporate social performance	CSP	0: Excluded	650
		1: Included	108
Industry	IND	1: Basic materials	53
		2: Consumer goods	137
		3: Health care	91
		4: Industrial goods	176
		5: Services	116
		6: Technology	137
		7: Utilities	48
Institutional context	IC	0: North America	542
		1: Europe	216

Table 4
Overview of the distribution of the qualitative variables.

Variable	Short	Mean	SD	Min	Max
Return on assets 1	ROA1	0.100	0.773	-0.480	0.540
Return on assets 2	ROA2	0.119	0.770	-0.243	0.701
Return on assets 3	ROA3	0.100	0.771	-0.123	0.743
Return on sales 1	ROS1	0.116	0.214	-4.677	0.579
Return on sales 2	ROS2	0.149	0.108	-0.756	0.680
Return on sales 3	ROS3	0.132	0.106	-0.279	0.570
Return on equity 1	ROE1	0.137	1.064	-11.160	20.523
Return on equity 2	ROE2	0.221	0.734	-7.926	12.053
Return on equity 3	ROE3	0.156	2.067	-19.918	47.597
Total assets 1	TA1	8.571	1.272	5.36	13.40
Total assets 2	TA2	8.883	1.182	5.92	13.49
Total assets 3	TA3	9.040	1.187	6.21	13.56
Total sales 1	TS1	8.338	1.363	-0.41	12.48
Total sales 2	TS2	8.676	1.227	5.31	12.75
Total sales 3	TS3	8.791	1.226	5.05	12.92

4.2 Results

In this section, the regression models and the results of the analyses are presented. Results from univariate tests can be found in appendix 1, the results from the multivariate tests (see 3.4) are presented below. Table 5 (5.1 to 5.3) gives results from the binary logistic regression analysis in which corporate social performance (2005-2007) is the dependent variable and corporate financial performance (2002-2004) is the independent variable. Table 6 (6.1 to 6.3) gives result from multiple linear regression analysis in which corporate financial performance (2008-2010) is dependent variable and corporate social performance (2005-2007) is independent variable.

The regression models that are used correspond to the hypotheses (as developed in section 2.3). An overview of the models that were used to test hypotheses 1 and 2 is presented first:

Hypothesis 1: Better corporate financial performance results in better corporate social performance.

This hypothesis is tested by means of binary logistic regression analysis. Corporate financial performance (return on assets, return on sales and return on equity) is used as a predictor of corporate social performance. Control variables are: size, risk, industry and institutional context. In model 1a, size is operationalized as total assets and total sales, in model 1b only total assets is included and in model 1c total sales.

Model 1a:
$\text{Logit}(p_{CSP2}) = \beta_0 + \beta_1 CFP_{ROA1} + \beta_2 CFP_{ROS1} + \beta_3 CFP_{ROE1} + \beta_4 SIZE_{TA1} + \beta_5 SIZE_{TS1} + \beta_6 RISK1 + \beta_7 IND + \beta_8 IC$
(CSP = ROA1 + ROS1 + ROE1 + TA1 + TS1 + RISK + IND + IC)

Model 1b:
$\text{Logit}(p_{CSP2}) = \beta_0 + \beta_1 CFP_{ROA1} + \beta_2 CFP_{ROS1} + \beta_3 CFP_{ROE1} + \beta_4 SIZE_{TA1} + \beta_5 RISK1 + \beta_6 IND + \beta_7 IC$
(CSP = ROA1 + ROS1 + ROE1 + TA1 + RISK1 + IND + IC)

Model 1c:
$\text{Logit}(p_{CSP2}) = \beta_0 + \beta_1 CFP_{ROA1} + \beta_2 CFP_{ROS1} + \beta_3 CFP_{ROE1} + \beta_4 SIZE_{TS1} + \beta_5 RISK + \beta_6 IND + \beta_7 IC$
(CSP = ROA1 + ROS1 + ROE1 + TS1 + RISK1 + IND + IC)

Hypothesis 2: Better corporate social performance results in better corporate financial performance.

This hypothesis is tested by means of multiple linear regression analysis. Corporate social performance is used as a predictor of corporate financial performance (ROA, ROS and ROE). Control variables are: size (total assets and total sales), risk, industry and institutional context. In model 1.1, CFP is operationalized as ROA, in model 1.2 as ROS and in model 1.3 as ROE.

Model 2.1: $CFP_{ROA3} = \beta_0 + \beta_1 CSP2 + \beta_2 SIZE_{TA2} + \beta_3 SIZE_{TS2} + \beta_4 RISK2 + \beta_5 IND + \beta_6 IC$
(ROA3 = CSP2 + TA2 + TS2 + RISK2 + IND + IC)

Model 2.2: $CFP_{ROS3} = \beta_0 + \beta_1 CSP2 + \beta_2 SIZE_{TA2} + \beta_3 SIZE_{TS2} + \beta_4 RISK2 + \beta_5 IND + \beta_6 IC$
(ROS3 = CSP2 + TA2 + TS2 + RISK2 + IND + IC)

Model 2.3: $CFP_{ROE3} = \beta_0 + \beta_1 CSP2 + \beta_2 SIZE_{TA2} + \beta_3 SIZE_{TS2} + \beta_4 RISK2 + \beta_5 IND + \beta_6 IC$
(ROE3 = CSP2 + TA2 + TS2 + RISK2 + IND + IC)

Table 5.1
Results from binary logistic regression analysis using 2005-2007 CSP as the dependent variable and 2002-2004 CFP as independent variables, controlling for total assets and total sales.

Model 1a:						
	B	s.e.	m.e.	B	s.e.	m.e.
Constant	-10.682***	1.135		-11.696***	1.256	
ln Total assets 1	0.608**	0.221	7.432	0.703*	0.335	8.595
ln Total sales 1	0.322	0.221	3.933	0.279	0.330	3.414
Risk 1	-0.262	0.977	-3.201	0.129	0.991	1.575
Industry:						
Consumer goods	-0.531	0.547	-6.483	-0.642	0.554	-7.846
Health care	0.103	0.576	1.253	0.011	0.585	0.138
Industrial goods	-0.269	0.524	-3.283	-0.270	0.527	-3.294
Services	-0.061	0.549	-0.739	-0.079	0.553	-0.967
Technology	0.048	0.551	0.591	0.051	0.560	0.625
Utilities	-0.948	0.763	-11.582	-0.998	0.770	-12.188
Institutional context	1.884***	0.254	23.019	1.949***	0.259	23.807
Return on assets 1				3.949	3.200	48.249
Return on sales 1				0.445	2.317	5.443
Return on equity 1				0.023	0.119	0.279
Nagelkerke R Square	0.372			0.381		
Hosmer and Lemeshow Test	8.957 (n.s.)			7.245 (n.s.)		
-2 Log likelihood	444.030			438.961		

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Reported are the estimates from binary logistic regression model 1a, using a sample of 758 companies. CSP is a dummy variable, companies are assigned 0 if they were continuously not included in the DJSI between 2005 and 2007 and 1 if they were continuously included in this period. Independent variables are measured between 2002 and 2004. ln total assets and ln total sales are the natural logs of both measures of firm size; risk is measured as the total long-term debt to total assets ratio; the reference category for the dummy variable industry is basic materials; institutional context is a dummy variable, companies from North America are assigned 0, companies from Europe 1; return on assets is measured as the earnings before interest and taxes to total assets ratio; return on sales is measured as the earnings before interest and taxes to total sales ratio; return on equity is measured as the net income to total stockholders' equity ratio.

Table 5.2
Results from binary logistic regression analysis using 2005-2007 CSP as the dependent variable and 2002-2004 CFP as independent variables, controlling for total assets.

Model 1b:						
	B	s.e.	m.e.	B	s.e.	m.e.
Constant	-10.425***	1.106		-11.663***	1.246	
ln Total assets 1	0.897***	0.105	10.960	0.973***	0.112	11.888
ln Total sales 1						
Risk 1	-0.514	0.958	-6.280	0.080	0.982	0.977
Industry:						
Consumer goods	-0.414	0.539	-5.058	-0.616	0.553	-7.526
Health care	0.215	0.566	2.627	0.051	0.581	0.623
Industrial goods	-0.244	0.520	-2.981	-0.270	0.527	-3.299
Services	-0.055	0.546	-0.672	-0.086	0.553	-1.051
Technology	0.016	0.547	0.195	0.017	0.558	0.208
Utilities	-1.099	0.751	-13.428	-1.080	0.762	-13.195
Institutional context	1.906***	0.253	23.287	1.958***	0.258	23.923
Return on assets 1				5.590*	2.384	68.298
Return on sales 1				-0.791	1.356	-9.664
Return on equity 1				0.027	0.120	0.330
Nagelkerke R Square	0.368			0.380		
Hosmer and Lemeshow Test	7.773 (n.s.)			6.409 (n.s.)		
-2 Log likelihood	446.180			439.749		

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Reported are the estimates from binary logistic regression model 1b, using a sample of 758 companies. CSP is a dummy variable, companies are assigned 0 if they were continuously not included in the DJSI between 2005 and 2007 and 1 if they were continuously included in this period. Independent variables are measured between 2002 and 2004. ln total assets is the natural log of total assets; risk is measured as the total long-term debt to total assets ratio; the reference category for the dummy variable industry is basic materials; institutional context is a dummy variable, companies from North America are assigned 0, companies from Europe 1; return on assets is measured as the earnings before interest and taxes to total assets ratio; return on sales is measured as the earnings before interest and taxes to total sales ratio; return on equity is measured as the net income to total stockholders' equity ratio.

Table 5.3
Results from binary logistic regression analysis using 2005-2007 CSP as the dependent variable and 2002-2004 CFP as independent variables, controlling for total sales.

Model 1c:						
	B	s.e.	m.e.	B	s.e.	m.e.
Constant	-10.072***	1.104		-11.321***	1.253	
ln Total assets 1						
ln Total sales 1	0.869***	0.106	10.617	0.952***	0.113	11.631
Risk 1	0.200	0.949	2.444	0.160	0.993	1.955
Industry:						
Consumer goods	-0.697	0.537	-8.516	-0.653	0.549	-7.978
Health care	-0.126	0.569	-1.539	-0.101	0.583	-1.234
Industrial goods	-0.290	0.519	-3.543	-0.246	0.523	-3.006
Services	-0.172	0.545	-2.101	-0.087	0.549	-1.063
Technology	0.118	0.544	1.442	0.142	0.552	1.735
Utilities	-0.588	0.751	-7.184	-0.784	0.761	-9.579
Institutional context	1.865***	0.251	22.786	1.943***	0.257	23.739
Return on assets 1				-0.743	2.477	-9.078
Return on sales 1				4.287**	1.649	52.378
Return on equity 1				0.018	0.117	0.220
Nagelkerke R Square	0.357			0.374		
Hosmer and Lemeshow Test	7.458 (n.s.)			6.737 (n.s.)		
-2 Log likelihood	451.771			443.142		

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Reported are the estimates from binary logistic regression model 1c, using a sample of 758 companies. CSP is a dummy variable, companies are assigned 0 if they were continuously not included in the DJSI between 2005 and 2007 and 1 if they were continuously included in this period. Independent variables are measured between 2002 and 2004. ln total sales is the natural log of total sales; risk is measured as the total long-term debt to total assets ratio; the reference category for the dummy variable industry is basic materials; institutional context is a dummy variable, companies from North America are assigned 0, companies from Europe 1; return on assets is measured as the earnings before interest and taxes to total assets ratio; return on sales is measured as the earnings before interest and taxes to total sales ratio; return on equity is measured as the net income to total stockholders' equity ratio.

Table 6.1
Results from multiple linear regression analysis using 2008-2010 ROA as dependent variable and 2005-2007 CSP as independent variable.

Model 2.1:				
	B	s.e.	B	s.e.
Constant	0.219***	0.023	0.236***	0.024
ln Total assets 2	-0.035***	0.005	-0.036***	0.005
ln Total sales 2	0.024***	0.005	0.023***	0.005
Risk 2	-0.068**	0.020	-0.067**	0.020
Industry:				
Consumer goods	0.000	0.012	0.001	0.012
Health care	0.018	0.012	0.018	0.012
Industrial goods	-0.019	0.011	-0.018	0.011
Services	0.011	0.012	0.011	0.012
Technology	-0.007	0.012	-0.007	0.012
Utilities	-0.006	0.015	-0.004	0.015
Institutional context	-0.004	0.006	-0.009	0.006
Corporate social performance			0.021*	0.009
R square	0.148		0.154	
F	12.932***		12.362***	

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Reported are the estimates from multiple linear regression model 2.1, using a sample of 758 companies. Return on assets is measured as the earnings before interest and taxes to total assets ratio between 2008 and 2010. Independent variables are measured between 2005 and 2007. ln total assets and ln total sales are the natural logs of both measures of firm size; risk is measured as the total long-term debt to total assets ratio; the reference category for the dummy variable industry is basic materials; institutional context is a dummy variable, companies from North America are assigned 0, companies from Europe 1; CSP is a dummy variable, companies are assigned 0 if they were continuously not included in the DJSI between 2005 and 2007 and 1 if they were continuously included in this period.

Table 6.2
Results from multiple linear regression analysis using 2008-2010 ROS as dependent variable and 2005-2007 CSP as independent variable.

Model 2.2:				
	B	s.e.	B	s.e.
Constant	0.223***	0.030	0.248***	0.031
ln Total assets 2	0.065***	0.006	0.063***	0.006
ln Total sales 2	-0.073***	0.006	-0.074***	0.006
Risk 2	-0.078**	0.026	-0.076**	0.026
Industry:				
Consumer goods	-0.020	0.016	-0.019	0.016
Health care	0.012	0.017	0.012	0.016
Industrial goods	-0.047**	0.015	-0.046**	0.015
Services	-0.017	0.016	-0.017	0.016
Technology	-0.032*	0.016	-0.032*	0.015
Utilities	-0.008	0.020	-0.005	0.020
Institutional context	-0.003	0.008	-0.010	0.008
Corporate social performance			0.030**	0.011
R square	0.202		0.210	
F	18.941***		17.996***	

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Reported are the estimates from multiple linear regression model 2.2, using a sample of 758 companies. Return on sales is measured as the earnings before interest and taxes to total sales ratio between 2008 and 2010. Independent variables are measured between 2005 and 2007. ln total assets and ln total sales are the natural logs of both measures of firm size; risk is measured as the total long-term debt to total assets ratio; the reference category for the dummy variable industry is basic materials; institutional context is a dummy variable, companies from North America are assigned 0, companies from Europe 1; CSP is a dummy variable, companies are assigned 0 if they were continuously not included in the DJSI between 2005 and 2007 and 1 if they were continuously included in this period.

Table 6.3
Results from multiple linear regression analysis using 2008-2010 ROE as dependent variable and 2005-2007 CSP as independent variable.

Model 1.3:				
	B	s.e.	B	s.e.
Constant	-0.527	0.656	-0.402	0.687
ln Total assets 2	0.014	0.140	0.003	0.142
ln Total sales 2	0.058	0.135	0.053	0.135
Risk 2	0.317	0.565	0.327	0.565
Industry:				
Consumer goods	0.359	0.342	0.365	0.342
Health care	0.037	0.359	0.035	0.360
Industrial goods	-0.138	0.325	-0.132	0.325
Services	-0.156	0.346	-0.154	0.346
Technology	0.100	0.337	0.097	0.338
Utilities	-0.083	0.426	-0.068	0.427
Institutional context	-0.136	0.170	-0.171	0.180
Corporate social performance			0.151	0.247
R square	0.011		0.011	
F	0.797		0.758	

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Reported are the estimates from multiple linear regression model 2.3, using a sample of 758 companies. Return on equity is measured as the net income to total stockholders' equity ratio between 2008 and 2010. Independent variables are measured between 2005 and 2007. ln total assets and ln total sales are the natural logs of both measures of firm size; risk is measured as the total long-term debt to total assets ratio; the reference category for the dummy variable industry is basic materials; institutional context is a dummy variable, companies from North America are assigned 0, companies from Europe 1; CSP is a dummy variable, companies are assigned 0 if they were continuously not included in the DJSI between 2005 and 2007 and 1 if they were continuously included in this period.

5. Interpretation and conclusion

In this chapter, the results reported in chapter 4 are discussed, interpreted, a conclusion about the hypotheses is provided and limitations and future research possibilities are considered. Finally, the research question is answered.

5.1 Interpretation

In this section, the results of the statistical tests are discussed. These results can be found in tables 5 and 6. First, a conclusion per hypothesis (as they were developed in section 2.3) will be given. Secondly, additional findings are reported.

5.1.1 Hypothesis 1

Hypothesis 1 states that better corporate financial performance results in better corporate social performance. In this research, corporate financial performance is operationalized as return on assets, return on sales and return on equity, measured as the average between 2002 and 2004 (period 1). Corporate social performance is operationalized as continuously (not) being included in the Dow Jones Sustainability Index between 2005 and 2007 (period 2). Several control variables are included in the regression analysis: firm size (measured as average total assets and/or total sales in period 1), firm risk attitude (measured as the average ratio of total long-term debt to total assets ratio in period 1), industry type and institutional context (North America or Europe).

Modeling the relationship between corporate financial performance and subsequent corporate social performance, based on the variables described above, results in three different models:

Model 1a:
$\text{Logit}(p_{CSP2}) = \beta_0 + \beta_1 CFP_{ROA1} + \beta_2 CFP_{ROS1} + \beta_3 CFP_{ROE1} + \beta_4 SIZE_{TA1} + \beta_5 SIZE_{TS1} + \beta_6 RISK1 + \beta_7 IND + \beta_8 IC$
(CSP = ROA1 + ROS1 + ROE1 + TA1 + TS1 + RISK + IND + IC)

Model 1b:
$\text{Logit}(p_{CSP2}) = \beta_0 + \beta_1 CFP_{ROA1} + \beta_2 CFP_{ROS1} + \beta_3 CFP_{ROE1} + \beta_4 SIZE_{TA1} + \beta_5 RISK1 + \beta_6 IND + \beta_7 IC$
(CSP = ROA1 + ROS1 + ROE1 + TA1 + RISK1 + IND + IC)

Model 1c:
$\text{Logit}(p_{CSP2}) = \beta_0 + \beta_1 CFP_{ROA1} + \beta_2 CFP_{ROS1} + \beta_3 CFP_{ROE1} + \beta_4 SIZE_{TS1} + \beta_5 RISK + \beta_6 IND + \beta_7 IC$
(CSP = ROA1 + ROS1 + ROE1 + TS1 + RISK1 + IND + IC)

All three models are statistically significant; in- or exclusion in the DJSI in period 2 can be predicted by means of period 1 return on assets, return on sales and return on equity, while controlling for period 1 firm size and risk attitude and type of industry and institutional context.

The three models do differ in terms of the individual predictor variables. Return on equity does not make a significant contribution to modeling corporate social performance, regardless of the measure of firm size. However, return on assets does make a significant contribution in modeling corporate social performance when firm size is controlled for by means of total assets (model 1b), not when firm size is measured as total sales (1c) or the combination of total assets and total sales (1a). In a similar way, return on sales makes a significant contribution in modeling corporate social performance when firm size is measured as total sales (1b), not when it is measured as total assets (1b) or both measures of firm size (1a).

In models 1b and 1c, financial performance has a positive impact on corporate social performance; a one unit increase in return on assets increases the chance of inclusion in the DJSI by 68%; a one unit increase in total sales increases the chance of inclusion in the DJSI by 52%. This implies that among firms with an equal amount of total assets, a higher return on assets increases the odds of being included in the DJSI, when risk attitude, industry, and institutional context are also taken into account. And, comparably, among firms similar in total sales, higher return on sales increases the odds of being included in the DJSI. These increases in the chance of inclusion seem large, but it has to be taken into account that a one unit increase in return on assets and return on sales is a substantial difference. Further analysis of the explanatory variables indicates that return on assets only significantly contributes to the model when total assets is controlled for, and return on sales only when total sales is controlled for[2].

This implies that, after controlling for risk, industry and institutional context, among firms with an equal amount of total assets, a higher return on assets increases the odds of being included in the DJSI. And, comparably, among firms similar in total sales, higher return on sales increases the odds of being included in the DJSI. Return on equity does not have an effect on subsequent corporate social performance. This implies that slack resources do play a role in corporate social performance; the results suggest that only financial performance measured before claims from financial stakeholders are considered (interest and taxes) is positively associated with corporate social performance. Resources remaining after satisfaction of financial claims are not associated with social performance.

These findings partly confirm hypothesis 1; better corporate financial performance results in better corporate social performance. In model 1a, return on assets (B=3.949, p=0.217), return on sales (B=0.445, p=0.848) and return on equity (B=0.023, p=0.848) do not significantly impact on subsequent corporate social performance. In model 1b, return on assets has a significant impact on subsequent corporate social performance (B=5.590, p=0.019), return on sales (B=-0.791, p=0.560) and return on equity (B=0.027, p=0.825) do not. In the last model, 1c, return on sales has a significant effect on subsequent corporate social performance (B=4.287, p=0.009), and return on assets (B=-0.743, p=0.764) and return on equity (B=0.018, p=0.875) not.

This may be explained by the resource-based view, as described in the theoretical section, not included in the theoretical framework and, therefore, not tested. Slack resources are invested in the four intangible assets that explain the positive relation between corporate financial performance and corporate social performance: innovation, human resources, reputation and corporate culture. These investments results in better corporate social performance

5.1.2 Hypothesis 2

Hypothesis 2 states that better corporate social performance results in better corporate financial performance. In testing this hypothesis, corporate financial performance is operationalized as return on assets, return on sales and return on equity, measured as the average between 2008 and 2010 (period 3). Corporate social performance is operationalized as continuously (not) being included in the Dow Jones Sustainability Index between 2005 and 2007 (period 2). Several control variables are included in the regression analysis: firm size (measured as average total assets and total sales in period 2), firm risk attitude (measured as the average ratio of total long-term debt to total assets ratio in period 2), industry type and institutional context (North America or Europe).

[2] In this additional analysis, all possible combinations of the five explanatory variables were regressed against corporate social performance. In all these models, return on assets and return on sales contributed significantly only when controlling respectively for total assets and total sales.

Operationalizing CFP as ROA, ROS and ROE results in three models:

Model 2.1: $CFP_{ROA3} = \beta_0 + \beta_1 CSP2 + \beta_2 SIZE_{TA2} + \beta_3 SIZE_{TS2} + \beta_4 RISK2 + \beta_5 IND + \beta_6 IC$
(ROA3 = CSP2 + TA2 + TS2 + RISK2 + IND + IC)

Model 2.2: $CFP_{ROS3} = \beta_0 + \beta_1 CSP2 + \beta_2 SIZE_{TA2} + \beta_3 SIZE_{TS2} + \beta_4 RISK2 + \beta_5 IND + \beta_6 IC$
(ROS3 = CSP2 + TA2 + TS2 + RISK2 + IND + IC)

Model 2.3: $CFP_{ROE3} = \beta_0 + \beta_1 CSP2 + \beta_2 SIZE_{TA2} + \beta_3 SIZE_{TS2} + \beta_4 RISK2 + \beta_5 IND + \beta_6 IC$
(ROE3 = CSP2 + TA2 + TS2 + RISK2 + IND + IC)

Two of these three models are statistically significant. Return on assets (2.1) and return on sales (2.2) in period 3 can be predicted based on corporate social performance, firm size, risk attitude, industry and institutional context (all measured in period 2). Return on equity could not be significantly predicted based on these variables.

In both significant models (the return on equity model is not significant), corporate social performance has a positive impact on financial performance. A one unit increase in CSP is associated with a 0.021 increase in return on assets and a 0.030 increase in return on sales.

These findings provide evidence for the instrumental stakeholder theory; companies that perform better in terms of corporate social performance subsequently perform better in terms of corporate financial performance. Again, this relationship does not hold for return on equity; corporate social performance is not associated with financial performance after taking into consideration the claims of financial stakeholders (interest and taxes). However, the impact of corporate social performance on subsequent financial performance is small.

Based on these results, hypothesis 2 is partly confirmed; better corporate social performance results in better corporate financial performance. In model 2.1, corporate social performance (B=0.021, p=0.016) significantly impacts on subsequent return on assets. In model 2.2, corporate social performance (B=0.030, p=0.008) significantly impacts on subsequent return on sales. However, in model 2.3, corporate social performance (B=0.151, p=0.542) does not have a significant effect on subsequent return on equity.

Although not included in the theoretical framework and, consequently not tested, the mechanism that links CSP tot CFP based on the resource-based view might explain these findings. Improvements in the four intangible assets put forward in this mechanism, reputation, innovation, human capital and organizational culture, may very well enable companies to be more efficient in generating earnings and in their operations. This would result in higher return on assets and return on sales. Reduced financial claims due to strong stakeholder relations are not necessarily a consequence of social performance and subsequent improvement of the four assets, explaining why corporate social performance is not associated with return on equity, and, therefore, profitability.

5.1.3 Other findings

Based on the results from binary logistic analysis, it can be concluded that firm size and institutional context are determinants of corporate social performance. In all three models, firm size is positively associated with social performance. The three models also show that originating from Europe increases the chance of inclusion in the DJSI.

Additionally, it is against expectations that risk attitude is negatively related to subsequent financial performance. More risk is expected to result in higher returns, in this sample this is not the case. This finding deserves more attention in additional analysis.

5.1.4 Conclusion

Taking into consideration the results from all multivariate tests, the following can be concluded about the relationship between corporate financial performance and corporate social performance.

First of all, size and institutional context are determinants of corporate social performance. Larger firms and firms originating in Europe perform better in terms of corporate social responsibility. Secondly, return on assets and return on sales are positively related to subsequent social performance, when firm size is controlled for (and institutional context, risk, and industry are also controlled). This implies that in testing this relationship, firm size is an important control variable, and that, most importantly, there is some evidence of the slack resources theory.

In the theoretical section a positive relation between corporate financial performance and corporate social performance was proposed, based on slack resources theory and the resource-based view. Slack, financial resources have a positive impact on four intangible, valuable corporate resources: reputation, innovation, human capital and organizational culture. These four are at the basis of a company's competitive advantage, in turn resulting in better corporate social performance. The results from this research support this line of reasoning to some extent; better return on assets, for companies that are of equal size in terms of total assets, results in better corporate social performance, and better return on sales, for companies that are equal in terms of total sales, also results in better corporate social performance.

Considering the results of multivariate tests of the relationship between corporate social performance and corporate financial performance, the following can be concluded.

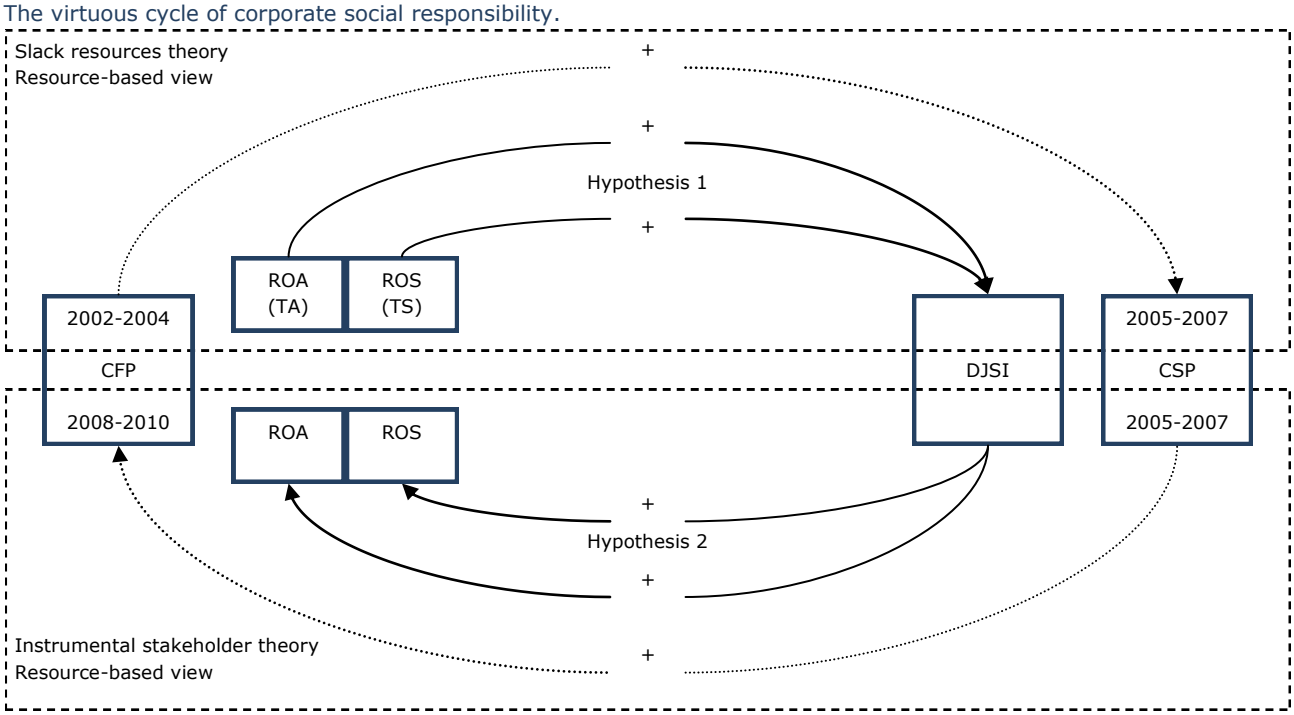
First of all, in contradiction to some of the first critiques of corporate social responsibility, firms that are able to perform better in terms of corporate social performance do not subsequently perform worse in terms of corporate financial performance. No evidence was found for a trade-off between corporate social and corporate financial performance. The prevalent opinion is that companies are firstly responsible for meeting financial claims of shareholders; based on these results it is, again, apparent that companies that take on an extra responsibility do not necessarily do so at the cost of shareholders. Therefore, fears of not being able to meet shareholder claims are not valid reasons for not engaging in corporate social responsibility.

Corporate social performance is positively related to subsequent financial performance, when firm size, risk, industry and institutional context are controlled. Corporate social performance is positively related to return on assets and return on sales. These findings provide evidence for the instrumental stakeholder theory; companies that perform better in terms of corporate social performance subsequently perform better in terms of corporate financial performance.

In the theoretical section a positive relation between corporate social performance and corporate financial performance was proposed, based on instrumental stakeholder theory and the resource-based view. Corporate social responsibility positively impacts on the four intangible assets (reputation, innovation, human capital and organizational culture), which in turn results in an improved competitive advantage and, consequently, better financial returns. The results from this research support this line of reasoning to some extent; corporate social performance for companies that are of equal size in terms of total assets and total sales, results in better return on assets and better return on sales.

Taken together, the results suggest a virtuous cycle of corporate social responsibility. Better corporate financial performance results in better corporate social performance and, in turn, better corporate social performance results in better financial performance. However, return on equity is not associated with subsequent corporate social performance and corporate social performance is not related to subsequent return on equity. Combining the theory and the findings of this research, figure 12 (next page) summarizes the relationship between corporate social performance and corporate financial performance.

Figure 12
The virtuous cycle of corporate social responsibility.



The dotted lines indicate the relationships identified in theory: based on slack resources theory and resource-based view, corporate financial performance is expected to relate positively to corporate social performance; based on instrumental stakeholder theory and resource-based view, corporate social performance is expected to relate positively to corporate financial performance.

The continuous lines indicate the relationships found in this research: return on assets (controlling for total assets) relates positively to inclusion in the DJSI, and return on sales (controlling for total sales) relates positively to inclusion in the DJSI (hypothesis 1); inclusion in the DJSI relates positively to return on sales, and to return on assets (hypothesis 2).

The conclusion above is based on research limited in several ways. First of all, using the DJSI as data source made it impossible to include the resource-based view in the theoretical framework. Although findings do support, to a certain extent, the framework as it was used, it would be of more value to test the intangible assets proposed by the resource-based view. Based on the data used, it is only possible to make general statements about the relationship between corporate social performance and corporate financial performance. The four intangible resources suggested in the mechanisms linking corporate social performance to corporate financial performance were not measured and not part of the statistical tests.

Secondly, in the definition of corporate social performance, a financial aspect is considered. Corporate social responsibility refers, among other things, to guaranteeing the financial stability of the company; something not achievable without financial performance. Because the DSJI company assessment methodology is not known, it could be that part of the construct that predicts financial performance is measured as financial performance.

Several factors limit the generalizability of the results: the sample exists of only the largest companies in the world; only the European and North American institutional context was considered, and although Rhineland and Anglo-Saxon models were introduced, Great Britain was categorized as European (Rhineland);

Based on the results of the research and the conclusion described above, several possibilities for future research can be identified. For instance, results indicate that institutional context does relate to corporate social performance, future research could investigate this association more thoroughly to shed more light on the influence of institutional context. Secondly, a more detailed analysis of

the differences in corporate social responsibility per industry, and the resulting differences in impact on corporate financial performance, deserves more attention. Finally, a research design that incorporates measures of the four intangible assets (reputation, innovation, human resources, and corporate culture) could shine further light on their role in the link between corporate social performance and corporate financial performance.

5.2 Answer to the research question

In recent decades, many theories about the relationship between corporate social performance and corporate financial performance were put forward, ranging from a predicted negative impact of corporate social responsibility on financial performance to a positive relation from financial performance to corporate social performance. In the same period, many of these theories and predictions were put to the test. Results from these tests were often contradictory. Partly, this is due to differences in research methodology and different ways of conceptualizing and operationalizing the variables of interest. Overall, the combined results suggest that the relationship between corporate social responsibility and corporate financial performance is at least neutral and perhaps slightly positive. However, the different approaches make it difficult to come to a final answer. In this thesis, the relation was put to the test once more, but only after trying to come to a more universal conceptualization and operationalization of the variables.

Corporate social responsibility finds its origin somewhere in the 1930's. In subsequent years, many definitions of the concept were given by different authors, and many concepts related to, or perhaps similar to, CSR were introduced. In retrospect, the development of the definition of the CSR concept, and related concepts, has centered on two themes: corporate relations in the economic, societal and environmental dimension, and sustainability. By combining these themes, the following definition was created: *Corporate social responsibility refers to a company's actions to include the interests of its stakeholders in the economic, social and environmental domain in its business operations, and to a company's actions aimed at guaranteeing the continued existence, at least at an equal level, of the company, society and the environment at large*. Corporate social performance was then defined as the extent to which companies are successful in implementing these actions. Corporate financial performance was defined as the financial outcome of business operations.

Operationalization of corporate social performance is based on inclusion in the Dow Jones Sustainability Index. The DJSI is an independently verified index of the world's leading sustainable companies. Yearly, the world's 2500 largest companies are assessed on general and industry specific sustainability criteria by means of self-report questionnaires, media- and stakeholder analysis, and data from secondary sources (company websites, annual reports, etc.) The sustainability criteria are identified through the assessment of economic, environmental and social driving forces and trends. The DJSI approach to identifying sustainability leaders fits nicely to the definition of corporate social responsibility and performance suggested in this thesis, and can serve as a reliable source of information now and in the future. Disadvantages of using the DJSI include the binary nature of the data, and the limitations it imposes on the theoretical framework due to the limited information available. Corporate financial performance was operationalized by means of three different accounting variables: return on assets is used to measure how well a company can turn its assets into revenue, return on equity measures the return on ownership equity, and return on sales is used to determine the operating performance.

In determining the relation between CSP and CFP, instrumental stakeholder theory, slack resources theory, and the resource-based view were considered. The RBV claims that companies that are equipped with valuable resources that are rare, difficult to imitate and hard to substitute have a competitive advantage over companies that do not have these resources, resulting in above average returns. Instrumental stakeholder theory and slack resources theory both state that the relationship between CSP and CFP is positive. Slack resources theory describes a positive relation

from CFP to CSP based on the availability of slack, financial resources; companies that have resources to invest in CSR will perform better. Instrumental stakeholder theory delineates a positive relation from CSP to CFP based on relations with stakeholders; CSR has a positive impact on a corporation's relationship with stakeholders, these improved relationships ultimately result in financial performance.

The combination of these two theories with the RBV results in a virtuous cycle of CSR. Slack financial resources have a positive impact on four intangible, valuable assets (reputation, innovative power, human capital, and culture), resulting in above average social performance. CSP, in turn, positively influences the same four intangible assets, resulting in above average financial performance.

Due to limitations in the data, hypotheses were developed based on a virtuous cycle that does not include the resource-based view but does include slack resources theory and instrumental stakeholder theory: hypothesis 1, better corporate financial performance results in better corporate social performance; and hypothesis 2, better corporate social performance results in better corporate financial performance.

These hypotheses were tested by means of multivariate statistical tests. Based on the results of these tests, the following conclusions were drawn. Size and institutional context are determinants of corporate social performance; larger firms have a greater chance of being included in the DJSI, as do firms originating from Europe compared to those from North America. Return on assets and return on sales are positively related to subsequent social performance, when firm size is appropriately controlled for, providing evidence of the slack resources theory. Corporate social performance is positively related to subsequent financial performance, providing evidence of the instrumental stakeholder theory.

These results show that corporate social performance does not come at a cost to shareholders. Taken together, the results provide evidence of a virtuous cycle of corporate social responsibility. Better corporate financial performance results in better corporate social performance and, in turn, better corporate social performance results in better financial performance. Both return on assets and return on sales take part in this cycle; however, return on equity is not associated with subsequent corporate social performance and corporate social performance is not related to subsequent return on equity. Based on all of the above, the answer to the research question must be: corporate social performance and corporate financial performance are positively related in the form of a virtuous cycle.

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Appendix 1

The results from univariate statistical tests are reported here. The following tests have been used:

t-test

The t-test used in this research is a two-sample t-test for the difference between two means. It is used to determine whether the means of two normally distributed populations are equal. In this case, these two populations are DJSI and non-DJSI companies. There are two hypotheses involved: H0, there is no difference in means, and H1, there is a difference is means. To reject H0, the chance that an observed difference in mean values (the p-value) occurs must be smaller than alpha (< 0.05). This difference is means is then termed significant. This test was used to determine if companies in- or excluded in the DJSI were different in terms of mean financial performance from 2002-2004 and from 2008-2010, mean firm size from 2002-2004, and mean risk tolerance from 2002-2004.

Chi-Square test of independence

The Chi-Square test of independence is used to determine whether two categorical variables are independent of each other. It is used in this thesis to determine whether inclusion in the DJSI is independent of institutional context and of industry type. Again, there are two hypotheses: H0, inclusion is independent of institutional context/industry type, and H1, inclusion in the DJSI is not independent of institutional context/industry type. To reject H0, the test statistic (the *p*-value) must be smaller than alpha.

ANOVA

Analysis of variance is a test comparable to the t-test, however more than two groups can be compared on their average means. The test does not indicate which groups differ from other groups; it does tell if there is a significant difference between groups. The two hypotheses are: H0, all groups have the same average mean score, and H1, the groups do not have the same average mean score. In this research the ANOVA test was used to determine if mean financial performance between 2008 and 2010 is equal for companies from different industry types.

Correlation

Correlation is a statistical technique that makes it possible to determine if two variables are related, and how strong this relationship is. It is used in this research to determine if there is a relationship between firm size/risk attitude and financial performance. The hypotheses involved are: H0, there is no relationship between the two variables; and H1, there is a relationship between the two variables.

Results from the various univariate tests are presented in the tables below. In the first table, table A1, results from comparing companies that were continuously included in the DJSI between 2005 and 2007 and companies that were continuously not included in this period, on the main variables of interest (return on assets, return on sales and return on equity) between 2002 and 2004 and 2008 and 2010 are presented. In the second table (table A2) similar results are presented but now for the control variables (institutional context, size, risk and industry).

Table A1

Test of the main variables of interest in the relation between CSP and CFP (and vice versa).

Slack resources theory: corporate financial performance leads to corporate social performance 2002-2004 ROA → 2005-2007 CSP | 2002-2004 ROS → 2005-2007 CSP | 2002-2004 ROE → 2005-2007 CSP			
Variable	Test	Result	Conclusion
ROA1	t-test	$t(756) = 0.323$, $p = 0.747$.	Companies continuously included in the DJSI between 2005 and 2007 were not significantly different in terms of average return on assets from 2002 to 2004 ($M = 0.0978$, $SD = 0.0620$) than companies continuously not included in the same period ($M = 0.1004$, $SD = 0.0796$).
ROS1	t-test	$t(756) = -0.222$, $p = 0.825$.	Companies continuously included in the DJSI between 2005 and 2007 were not significantly different in terms of average return on sales from 2002 to 2004 ($M = 0.1203$, $SD = 0.0899$) than companies continuously not included in the same period ($M = 0.1153$, $SD = 0.2288$).
ROE1	t-test	$t(756) = -0.091$, $p = 0.848$.	Companies continuously included in the DJSI between 2005 and 2007 were not significantly different in terms of average return on equity from 2002 to 2004 ($M = 0.1560$, $SD = 0.2531$) than companies continuously not included in the same period ($M = 0.1348$, $SD = 1.1446$).
Instrumental stakeholder theory: corporate social performance leads to corporate financial performance 2005-2007 CSP → 2008-2010 ROA | 2005-2007 CSP → 2008-2010 ROS | 2005-2007 CSP → 2008-2010 ROE			
Variable	Test	Result	Conclusion
ROA3	t-test	$t(756) = -0.210$, $p = 0.833$.	Companies continuously included in the DJSI between 2005 and 2007 were not significantly different in terms of average return on assets from 2008 to 2010 ($M = 0.1023$, $SD = 0.0613$) than companies continuously not included in the same period ($M = 0.1007$, $SD = 0.0796$).
ROS3	t-test	$t(756) = -1.242$, $p = 0.215$.	Companies continuously included in the DJSI between 2005 and 2007 were not significantly different in terms of average return on sales from 2008 to 2010 ($M = 0.1436$, $SD = 0.1030$) than companies continuously not included in the same period ($M = 0.1300$, $SD = 0.1062$).
ROE3	t-test	$t(756) = -0.0675$, $p = 0.500$.	Companies continuously included in the DJSI between 2005 and 2007 were not significantly different in terms of average return on equity from 2008 to 2010 ($M = 0.2804$, $SD = 1.2838$) than companies continuously not included in the same period ($M = 0.1353$, $SD = 2.1700$).

Table A2

Test of control variables in the relation between CSP and CFP (and vice versa).

Slack resources theory: corporate financial performance leads to corporate social performance
2002-2004 size → 2005-2007 CSP | 2002-2004 risk → 2005-2007 CSP | IC → 2005-2007 CSP | Industry → 2005-2007 CSP

Control variable	Test	Result	Conclusion
IC	Chi^2	$X^2(1, N = 758) = 90.058, p < 0.01$	A chi-square test of independence was performed to examine the relation between institutional context and continuous inclusion in the DJSI between 2005 and 2007. The relation between these variables was significant; North American companies were less likely to be included in the DJSI than European companies.
Size: TA1	t-test	$t(756) = -10.805, p < 0.01$.	Companies continuously included in the DJSI between 2005 and 2007 were significantly larger in terms of average total assets from 2002 to 2004 ($M = 9.7116$, $SD = 1.2105$) than companies continuously not included in the same period ($M = 8.3815$, $SD = 1.1804$).
Size: TS1	t-test	$t(756) = -10.373, p < 0.01$.	Companies continuously included in the DJSI between 2005 and 2007 were significantly larger in terms of average total sales from 2002 to 2004 ($M = 9.5184$, $SD = 1.1310$) than companies continuously not included in the same period ($M = 8.1427$, $SD = 1.2988$).
RISK1	t-test	$t(756) = 0.980, p = 0.329$.	Companies continuously included in the DJSI between 2005 and 2007 ($M = 0.2020$, $SD = 0.1230$) were not significantly different from those not included ($M = 0.2151$, $SD = 0.1551$) in terms of average risk between 2002 and 2004.
IND	Chi^2	$X^2(6, N = 758) = 2.120, p = 0.908$	A chi-square test of independence was performed to examine the relation between industry and continuous inclusion in the DJSI between 2005 and 2007. The relation between these variables was not significant; inclusion in the DJSI does not depend on industry type.

Table is continued on the next page.

Table A2
Continued

Instrumental stakeholder theory: corporate social performance leads to corporate financial performance 2005-2007 size → 2008-2010 CFP | 2005-2007 risk → 2005-2010 CFP | IC → 2008-2010 CFP | Industry → 2008-2010 CFP

Control variable	Test	Result	Conclusion
IC	t-test	ROA: $t(756) = 0.823$, $p = 0.411$.	North American ($M = 0.1023$, $SD = 0.0769$) and European ($M = 0.0972$, $SD = 0.0781$) companies were not significantly different in terms of mean average return on assets between 2008 and 2010.
		ROS: $t(756) = 0.548$, $p = 0.281$.	North American ($M = 0.1332$, $SD = 0.1093$) and European ($M = 0.1286$, $SD = 0.0964$) companies were not significantly different in terms of mean average return on sales between 2008 and 2010.
		ROE: $t(756) = 0.722$, $p = 0.370$.	North American ($M = 0.1902$, $SD = 2.3635$) and European ($M = 0.0700$, $SD = 0.9876$) companies were not significantly different in terms of mean average return on equity between 2008 and 2010.
Size: TA2	correlation	ROA: $r(756) = -0.238$, $p < 0.01$	Mean average total assets between 2005 and 2007 is significantly correlated with mean average return on assets between 2008 and 2010.
		ROS: $r(756) = 0.016$, $p = 0.661$	Mean average total assets between 2005 and 2007 is not significantly correlated with mean average return on sales between 2008 and 2010.
		ROE: $r(756) = 0.034$, $p = 0.352$	Mean average total assets between 2005 and 2007 is not significantly correlated with mean average return on equity between 2008 and 2010.
Size: TS2	correlation	ROA: $r(756) = -0.084$, $p = 0.020$	Mean average total sales between 2005 and 2007 is significantly correlated with mean average return on assets between 2008 and 2010.
		ROS: $r(756) = -0.220$, $p < 0.01$	Mean average total sales between 2005 and 2007 is significantly correlated with mean average return on sales between 2008 and 2010.
		ROE: $r(756) = 0.045$, $p = 0.217$	Mean average total sales between 2005 and 2007 is not significantly correlated with mean average return on equity between 2008 and 2010.
RISK2	correlation	ROA: $r(756) = -0.181$, $p < 0.01$	Mean average risk between 2005 and 2007 is significantly correlated with mean average return on assets between 2008 and 2010.
		ROS: $r(756) = 0.017$, $p = 0.650$	Mean average risk between 2005 and 2007 is not significantly correlated with mean average return on sales between 2008 and 2010.
		ROE: $r(756) = 0.009$, $p = 0.802$	Mean average risk between 2005 and 2007 is not significantly correlated with mean average return on equity between 2008 and 2010.
IND	ANOVA	ROA: $F(6,751) = 6.625$, $p < 0.01$	Firms in the various industries do not have equal mean average return on assets between 2008 and 2010.
		ROS: $F(6,751) = 7.199$, $p < 0.01$	Firms in the various industries do not have equal mean average return on sales between 2008 and 2010.
		ROE: $F(6,751) = 0.995$, $p = 0.428$	Firms in the various industries have equal mean average return on sales between 2008 and 2010.