ESSAYS ON CORPORATE SOCIAL RESPONSIBILITY

by

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Abstract

Corporate Social Responsibility (CSR) is very high on corporations' agenda in recent years. CSR means different things to different stakeholders but generally refers to serving people, communities and the environment in a way that goes beyond what is legally required of a firm. In this paper-based dissertation we analyze some potential driving forces behind this corporate behavior.

The first paper explores the role of Socially Responsible Investing (SRI) - making investment decisions according to both financial and ethical criteria. We analyze the effect of SRI on the investment decisions of firms that fail the screen ('polluting' firms) and on their decisions to adopt a CSR-approved technology. These issues are examined in an equilibrium setting with endogenous investment decisions. We find that the presence of socially responsible investors can lead to under-investment by polluting firms but their current proportion among all investors (11%) is not enough to induce polluting firms to change their technology.

The second paper further explores the role of SRI in a richer theoretical framework. We model a capital market in which some investors get direct utility from owning firms that spend on CSR. We also assume different categories of firms: those with good CSR fundamentals and those with poor CSR fundamentals. In equilibrium, investors' CSR considerations shape their financial portfolio decisions, affect stock prices and influence corporate CSR spending decisions. We also examine optimal tax policy questions, looking to maximize total individual donations plus corporate CSR spending less the tax rebates given for such spending.

The third paper argues that insiders (managers and large blockholders) who are affiliated with the firm may want to over-invest in CSR for their private benefit since it improves their reputation. We test this hypothesis by investigating the relation between firms' CSR ratings and their ownership and capital structure. We employ a unique dataset that sorts 3,000 US corporations according to their social record. We find that insiders' ownership and leverage are negatively related to the social rating of firms, while institutional ownership is uncorrelated with it. These results support the hypothesis that CSR is a source of a conflict between different shareholders.

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Complying with the UBC guidelines for a manuscript-based thesis, I state here the role of each co-author in each manuscript.

Chapter II of the thesis includes work done in collaboration with Alan Kraus, my committee chair and Rob Heinkel a member of my committee. The chapter is a natural extension of previous work by Rob Heinkel, Alan Kraus and Joseph Zechner. Alan Kraus proposed the initial idea of this work. My role started by developing the model and performing the calculations and numerical simulations that were needed in order to solve it. Throughout the work on the project the three of us were working very closely together, dealing with technical difficulties that arose and gaining the economic understanding of the results. All of us contributed for the manuscript preparation. The chapter is scheduled for publication at the journal *Structural Change and Economic Dynamics* in 2005.

Chapter III of the thesis also includes work done in collaboration with Alan Kraus and Rob Heinkel. In this work Rob Heinkel was the major contributor for the development of the model while Alan Kraus and myself worked closely with him on the assumptions and specifications of the model. I also performed the numerical and computational aspects of the work. All of us contributed to the manuscript preparation. Again, throughout the development of the project we were working closely, meeting very frequently, gaining together the economic intuitions of the results and overcoming technical difficulties.

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CHAPTER I
INTRODUCTION

The flowering of Corporate Social Responsibility (CSR) is one of the most significant corporate trends of the last decade. Definitions of CSR vary but generally refer to serving people, communities and the environment in a way that goes above and beyond what is legally required of a firm. This alignment of business operations with social values is by now an industry in itself, with full-time staff in corporations, hundreds of websites, newsletters, professional associations and consultants. Students can earn an MBA degree in CSR and they attend seminars on careers in CSR. Most major companies have a special annual report dedicated to CSR; others devote a big section of the report to the documentation of social goals advanced and good works undertaken. The FTSE and the Dow Jones have both launched indices of socially responsible companies joining similar indices around the world. This dissertation analyzes some of the potential driving forces behind this new corporate behavior.

1.1 CSR and Profitability

One can argue that firms' interest in CSR is driven solely by profit maximization. For example, a high CSR expenditure by a firm may enhance its employees' productivity (for example, day-care benefits that are provided) or increase consumers' demand for the firm's product (for example, fair trade coffee). As such, CSR may be a simple response to the changing preferences of firms' stakeholders; today's consumers, employees and suppliers demand higher social and environmental standards and firms are responding to this call.

It is important to note that even if this observed, high level of CSR expenditure is consistent with maximizing profitability, it has to be the case that the general relation between CSR expenditure and firm value is non-monotonic with an inverted U-shape curve. When CSR expenditure is low, an additional dollar

invested in CSR may have a positive contribution to firm value (good publicity, higher productivity, etc.), but at some point the marginal effect of an additional dollar of CSR expenditure is less than the amount spent and so decreases firm value as there is no limit to the amount that a firm can transfer to its stakeholders or to the society.

To illustrate the point, consider for example donations made by corporations to the 2004 tsunami victims in Asia. (Corporate donations is one of the most popular forms of CSR). With an initial, small amount donated, it is reasonable to assume that firms gain good publicity and reputation benefits that may translate into higher profitability at some point. But if firms increase the amount that they donate further, it is clear that, at some point, the marginal dollar donated will reduce firm value. Therefore, theoretically, there should be an optimal level of CSR expenditure (with variation across firms and across industries) which is consistent with maximizing shareholders' wealth.

The vast majority of research on CSR analyzes the empirical relation between the social performance and the financial performance of firms. Dozens of papers, almost all in the business ethics literature, investigate the possible relation between the two in various ways. The standard approach is to place on the left hand side of the regression some kind of a financial measure (e.g., return on equity/ return on assets / Tobin's q) and on the right hand side some measure of social performance and a list of control variables. In a large survey, Griffin and Mahon (1997) scan some 70 papers that investigate this relationship and conclude that although the results are incomparable, inconsistent and suffer from severe estimation problems, out of the 70 papers reviewed, a majority document a positive relation between the financial and social performance of firms.

From a theoretical perspective, this result is puzzling. If there are financial benefits for social spending why don't all firms pursue them? As McWilliams and Siegel (2001) argue, while there should be variations in the level of CSR expen-

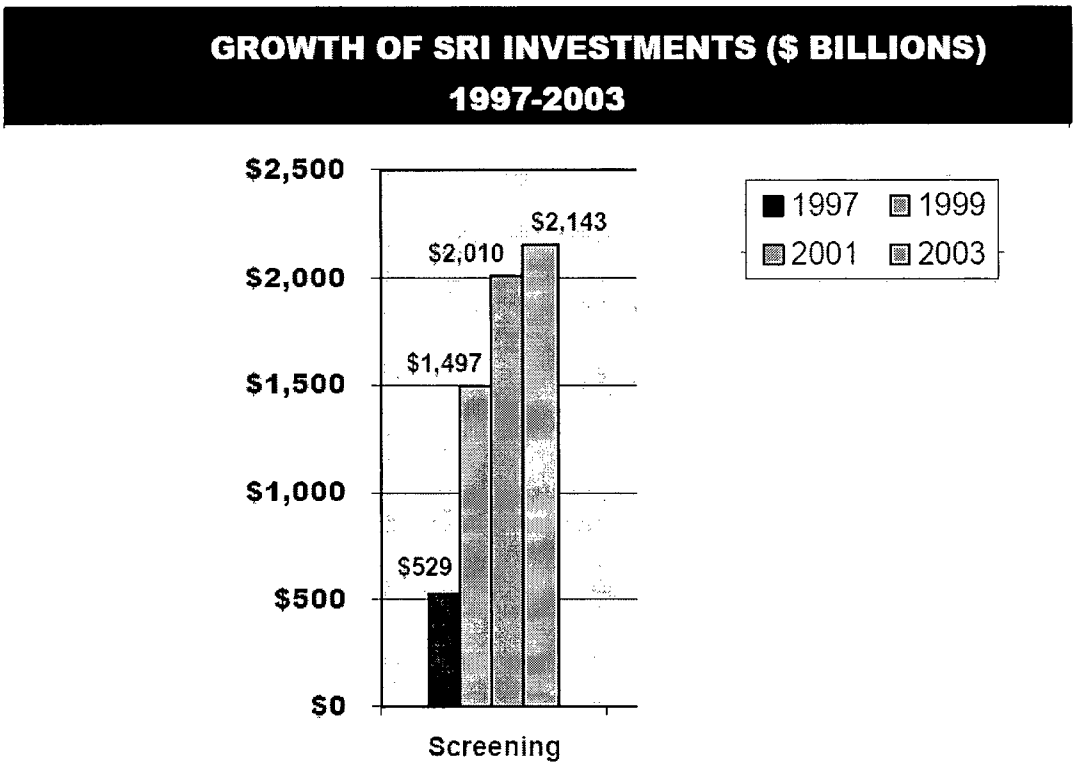
ditures across companies and across industries, once the appropriate controls are applied there shouldn't be any correlation between financial and social measures. Indeed, in an empirical paper, McWilliams and Siegel (2000) find no correlation between the two.

1.2 Socially Responsible Investing – Exclusionary Screening

A second potential driving force behind firms' urge to improve their social record is the concept of Socially Responsible Investing (SRI). SRI reflects an investing approach that integrates social and environmental concerns into investment decisions. SRI first gained widespread public awareness with the boycott of firms engaged in operations in South Africa during the apartheid regime in the late 1980s. These days, a typical exclusionary screening practice would be to use all firms included in the S&P 500 as the initial opportunity set and exclude from an ethical portfolio firms in the tobacco, weapons and gambling businesses or those who have poor employer-employee relationship.

Exclusionary screening can follow two types of screening methodologies. An investor who is using *per-se screening*, excludes all firms in a particular sector (e.g. tobacco) from his portfolio. Alternatively, according to a *qualitative screening* approach, firms are ranked along many ethical / social / environmental dimensions and only those who pass some threshold are eligible for investment. It is important to note that no matter which screening method is applied, the result is the same - excluding securities from the investment universe of the investor.

The number of socially responsible investors has increased rapidly in the last decade. Funds under management that are subject to some form of ethical screening account for about 11% of total managed funds in the US and about 4% in Canada (see Figure I.1 for US numbers). It is important to note, though, that the group of socially responsible investors is not a homogenous one. So-



Source: Social Investing Forum, "2003 Report on Socially Responsible Investing Trends in the US"

Figure I.1: The growth of SRI investments ($bn) in the USA for the period 1997 - 2003

cial investors include individuals, businesses, universities, hospitals, foundations, pension funds, corporations, religious institutions, and other non-profit organizations. Different investors have different ideologies with respect to the good and bad in the world. Therefore, each investor may have a different "target" list of firms to be boycotted.

Despite their impressive presence, it is still not clear what the role of socially responsible investors is. Do they simply want to feel good about themselves by not receiving returns from "sinful" industries or do these investors want to make a difference by changing corporate behavior. Moreover, even if all socially responsible investors join forces and act in coordination, do they have enough power to change corporate behavior towards a more socially responsible agenda?

And if they do so, what will be the rate of return on their portfolio relative to that of conventional portfolios?

SRI-related literature has focused so far on the empirical analysis of the performance of portfolios that are subject to SRI strategy (usually mutual funds) versus non-constraint portfolios. From the theory side, there are only a few papers that investigate the issue.

Hamilton, Jo and Statman (1993) present three competing hypotheses with respect to the relative performance of socially responsible firms which they test empirically. The first hypothesis is that the expected risk-adjusted returns of socially responsible stocks is equal to the expected risk-adjusted returns of conventional stocks or in other words, that stocks have horizontal demand curves. In this world, socially responsible investors have no impact on prices because whenever they wish to buy stocks of socially responsible companies they find enough conventional investors ready to sell them, such that the prices of the stocks do not rise.

The second hypothesis is that stocks have downward sloping demand curves. Therefore, the expected returns of socially responsible stocks may be lower than the expected returns of conventional stocks. This hypothesis implies that socially responsible investors can have an impact on stock prices. In particular, they increase the valuation of socially responsible companies relative to the valuation of conventional companies and drive down the cost of capital of socially responsible companies and the expected returns of their stocks.

The third hypothesis is that the expected returns of socially responsible stocks are higher than the expected returns of conventional stocks. This is possible if a sufficiently large number of investors consistently underestimate the probability that negative information would be released about companies that are not socially responsible. For this hypothesis to hold, it is not enough that socially responsible firms will have better financial performance. Asymmetric information among

investors is the crucial assumption for this hypothesis to hold.

The second hypothesis was further explored by Wall (1995) and Angel and Rivoli (1997) who numerically evaluate the financial consequences (increased cost of capital) of ethical screening using Merton's (1997) framework of segmented markets and by Heinkel, Kraus and Zechner (2001) who develop an equilibrium model where socially responsible investors can affect firms' cost of capital.

The first paper (second chapter) of the dissertation extends the model proposed by Heinkel, Kraus and Zechner (2001). They analyze the effect of exclusionary screening in lowering a polluting firm's share price to the point where maximizing share value supports paying a fixed cost to reform, allowing the firm's shares to be held by the investors applying the social screen. However, in that model investment by firms is held constant. In the first paper, we endogenize investment decisions and examine the potential impact that exclusionary screening have on total economy-wide investment.

Answering the question what is the critical mass of socially responsible investors that is required in order to create this impact is one of the main issues addressed in this work. It seems that the current proportion of these investors is not enough to change corporate behavior. Even if one assumes that all socially responsible investors are homogenous in their preferences and that the cost involved in changing firms' technology to one which is "SRI-approved" is low, the model predicts that if socially responsible investors account for less than 35% of the total number of investors, no firm will find it optimal to change its technology to a socially responsible one. At current estimates of up to 11%, the effect of SRI on corporations seems to be insignificant.

On the empirical side of SRI-related literature, most studies analyze the performance of socially responsible portfolios such as mutual funds in the US. Major studies are those by Hamilton, Jo and Statman (1993), Diltz (1995), Sauer (1997) Goldreyer and Diltz (1999), Statman (2000), Bauer, Otten and Rad (2004) and

Geczy, Stambaugh and Levin (2004). There are also a few papers documenting the effects of divesting shares of firms engaged in operations in South Africa during the apartheid regime in the late 1980s, for example, Teoh, Welch, and Wazzan (1999). In broad terms, all of the empirical studies document similar performances for SR portfolios versus conventional ones. This evidence supports that first hypothesis described above or simply illustrates that the number of socially responsible investors is too low to create a significant impact on prices.

1.3 Socially Responsible Investing – Other Investing Methodologies

Not all socially responsible investors use an exclusionary screening methodology. Moderate socially responsible investors may simply want to hold fewer shares of firms that their business is not viewed as moral by these investors instead of strictly boycotting them. On the other hand, some investors may wish not only to avoid holding shares but even to short sell shares of firms that they consider irresponsible.

Moreover, it is plausible that even among those investors who value social expenditures made by corporations, some investors may prefer to make their own private decisions with respect to the cause that their money is directed to. In other words, they may prefer to receive higher dividends from the corporation and choose by themselves whether or how to allocate these funds to a good cause. The theoretical framework of the second paper (third chapter) "allows" investors this freedom in their decisions.

Another important feature that the third chapter models is that CSR behavior may be viewed quite differently by investors when done by different firms. For firms with a clean technology, a healthy product and good labor relations, CSR expenditures may not have the same marginal impact on investors as CSR expenditures by a firm with a polluting technology, poor labor relations and an

unhealthy product. The latter firm may still be viewed negatively on balance by investors, but the CSR expenditure might have a greater positive impact on investors than for the clean, healthy firm.

Lastly, the third chapter examines optimal tax policy questions. Individuals can deduct private donations from their taxable income. Similarly, corporations can deduct most CSR related expenditure from their revenue for tax purposes but only up to a ceiling (percentage of revenue) which is set by the government. We show that there is a way to maximize a "Social Surplus" which is defined as total individual donations plus corporate CSR spending less the tax rebates given for such spending, using the different tools that the government has: tax rates for individuals and corporations and the ceiling for CSR expenditure.

Small and Zivin (2002) develop a related but much simpler model that shares some similarities to the third chapter developed here. They model an economy in which investors with utility that is concave in consumption and donations (both the investor's and the corporation's) make donations and invest in two riskless firms' shares. One firm makes a fixed donation and one does not. Investors consume out of the end-of-period riskless cash flows from their shareholdings, less what they donate. There are no frictions, such as taxes in the model.

In this simple world, Small and Zivin (2002) develop a "Modigliani-Miller" irrelevance result. Suppose that investors optimally wish to donate. The two firms' share prices will be equal and will be independent of the level of donation made by the donating corporation. The idea is that if the donating firm changes its donation level, investors can offset the effect of this by altering their private donation. The model that we develop here can duplicate this "irrelevance result" if one uses the same assumptions as in Small and Zivin (2002): (i) a riskless technology, (ii) exogenous level of corporate investment and CSR spending, (iii) only one type of investor (our "altruistic" investors) and (iv) no taxes.

1.4 CSR as a Conflict Between Shareholders

The third paper (fourth chapter) of the dissertation is an empirical work that tests a different potential explanation for the dramatic increase in CSR expenditure. The hypothesis is that these actions are advanced by insiders - affiliated shareholders such as corporate managers and large blockholders. Insiders' reputation, identity or heritage is closely tied to the firm and since actions taken by the corporation are associated with them on a personal level, they may have an interest to increase CSR expenditure to a level which is higher than that which maximizes firm value. A good CSR record would enhance their reputation as being decent individuals who respect their employees, communities and the environment and care about society.

While insiders are closely associated with a specific firm, non-affiliated owners hold shares in firms as part of a well diversified portfolio and have a relation with each individual firm that does not go beyond its effect on their portfolio value. Therefore, they may not approve a high CSR expenditure level if it reduces firm value given that they don't share the "warm glow" effect of giving. Therefore, CSR may be the source of a conflict between affiliated and non-affiliated shareholders.

The group of insiders is composed of three subgroups: managers, blockholders who are not part of the daily management team, and directors who are not part of the first two groups. It is hard to hypothesize which group gains more from being associated with a socially responsible firm. However, we argue that all three subgroups care about the firm's CSR rating more than does a diversified shareholder. For example, consider the following three individuals: Steven Jobs, the CEO of Apple Computer, Warren Buffet, a large blockholder of The Coca-Cola Company and Roy Disney, a director of The Walt Disney Company. All three individuals are strongly affiliated with their corresponding firm. Our

hypothesis is that these individuals gain from the fact that these firms have a high CSR rating more than does a diversified shareholder such as Fidelity, whose image is not affected by the social rating of one specific firm.

In order to test this potential conflict we analyze the relation between CSR and the ownership and capital structure of the 3,000 largest US corporations. If insiders gain unique benefits at the expense of other shareholders, their degree of ownership should matter in setting the level of CSR expenditure in the firm. The level of ownership by insiders can have two potential effects: on the one hand, with high ownership comes entrenchment, which allows insiders to pursue a pro-CSR agenda more easily. But on the other hand, when insiders' ownership is high, insiders bear more of the cost of the CSR expenditure. Therefore, if CSR expenditure is at a level at which it reduces firm value, insiders' ownership should be negatively related to the level of CSR expenditure since insiders bear more of the cost associated with this expenditure as their degree of ownership rises.

The capital structure of the firm may also influence the CSR conflict. When firms have high interest payments, it limits the ability of insiders to over-invest in CSR. A high debt level also induces creditors to play a more active monitoring role which may help to mitigate the conflict.

We find supportive evidence to our hypothesis: firms that have a higher social ranking tend to have looser monitoring mechanisms, giving insiders the freedom to spend more on CSR without paying a significant portion of this amount out of their own pocket.

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CHAPTER II
GREEN INVESTORS AND CORPORATE INVESTMENT

2.1 Introduction

Green investing, or socially responsible investing (SRI), refers to making investment decisions according to both financial and ethical criteria. SRI first gained widespread public awareness with the boycott of firms engaged in operations in South Africa during the apartheid regime in the late 80[illegible]s. Teoh, Welch and Wazzan (1999) argue that, at that time, the magnitude of funds that were subject to this boycott policy and the impact of these actions were negligible. On the other hand, during the last decade the amounts of investments that are subject to SRI policies have increased more than tenfold. According to the Social Investing Forum, an association dedicated to promoting the concept of green investing, the amount of money involved in SRI reached a level of $2.2 trillion in 2003, accounting for about 11 percent of all managed funds in the US.[1]

The Social Investing Forum defines three strategies that are used by investors who wish to promote socially and environmentally responsible business practices: *screening*, *shareholder activism* and *community investing*. We focus on screening, the practice of including or excluding publicly traded securities from investment portfolios or mutual funds based on social and/or environmental criteria. A typical exclusionary screening practice would be to use all firms included in the S&P 500 as the initial opportunity set and exclude from an ethical portfolio firms in the tobacco, weapons and gambling businesses. On the other hand, an inclusionary screening approach involves selecting companies based on their positive contributions to society such as outstanding employer-employee relations, excellent environmental practices and so on. Exclusionary screening can follow

[0]This chapter, co-authored with Rob Heinkel and Alan Kraus is scheduled for publication in *Structural Change and Economic Dynamics* in 2005.

[1]See also Statman (2000) for a discussion about the magnitude of funds invested using SRI.

two types of screening methodologies. An investor who is using *per-se* screening excludes all firms in a particular sector (e.g. tobacco) from his portfolio. Alternatively, according to a *qualitative* screening approach, firms are ranked along many ethical/social/environmental criteria and only those who pass some threshold are eligible for investment. It is important to note that no matter which screening method is applied, the result is the same - excluding securities from the investment universe of the investor.

Previous research in the area has considered the impact of stakeholders on the social behavior of the firm. McWilliams and Siegel (2001), for example, analyze the impact of consumers on firms' decisions to engage in corporate socially responsible (CSR) actions ("reform" in our terminology). Russo and Fouts (1997) claim that a corporation with a good environmental performance has a positive impact on its employees, technology and reputation which leads to higher profitability. Jones (1995) argues that firms that devote resources to CSR have a competitive advantage over other firms in the product market. While these researchers suggest that the motive for the social behavior of the firm is stakeholders such as employees, consumers and regulators, this chapter analyzes the potential impact of green *investors* on the investment decisions of firms and on their decisions to reform.

We focus on exclusionary screening, which is by far the most popular SRI practice, accounting for over $2.0 trillion of the $2.2 trillion mentioned above. Heinkel, Kraus and Zechner (HKZ, 2001) analyze the effect of exclusionary screening in lowering a polluting firm's share price to the point where maximizing share value supports paying a fixed cost to reform, allowing the firm's shares to be held by the investors applying the screen. However, in that model investment by firms is held constant. In this chapter, we endogenize investment and examine the impact that exclusionary screening has on total economy-wide investment.

In our model, risk-neutral entrepreneurs have projects that they wish to im-

plement and sell to risk-averse investors. The entrepreneur chooses a cumulative investment amount K and sells the firm to investors for P, earning the investment's net present value, $P - K$.[2] This assumes the entrepreneur orders projects by NPV and takes projects until NPV = 0 for the next best project. The projects belong to a set of two types. Half of them have a *clean* technology ($N_c = .5$) and the other half have a *polluting* technology ($N_p = .5$). The expected returns and variances of the two technologies are identical, but the correlation between the returns is less than 1.0, thus offering diversification benefits to investors.

Risk-averse investors are composed of two types of individuals: *neutral* investors, who do not practice exclusionary screening and *green* investors, who do. Green investors refuse to hold shares of firms with polluting technologies. The fraction of green investors in the economy, $\frac{I_g}{I}$, is set exogenously between 0 and 1. Both green and neutral investors have the same level of risk aversion. Entrepreneurs having polluting technology projects can, before selling their stock to the public, spend C and become *reformed.* Reformed firms retain the characteristics of the polluting technology (i.e., mean, variance and correlation with the clean technology), but they are now acceptable to green investors. The number of firms with polluting technologies that switch from polluting to reformed is endogenous (N_r varies from 0 to .5) to satisfy the equilibrium condition $P_r - K_r - C = P_p - K_p$. That is, in equilibrium no polluting firm can benefit from reforming.

Green investors hold clean and reformed firms but in order to have no arbitrage we limit neutral investors (as in HKZ (2001)) to hold clean and polluting firms only and prohibit short selling shares of reformed firms by these investors. Otherwise, the neutral investors could earn a riskless arbitrage profit by shorting the reformed firms and buying the polluting firms since the latter use exactly the same technology but their share price is lower (when there are positive reforming costs). All firms within each of the three firm categories are identical but they

[2]We assume that the market for new projects has positive NPV opportunities due to limited access.

choose their investment atomistically and not as a cartel.

Our interest is in how varying the fraction of green investors from 0 to 1 alters the prices and investment levels of clean, polluting and reformed (if they exist) firms. For expositional reasons, we describe this process as though $\frac{I_g}{I}$ were increasing. However, since we have a single-period model, the analysis is actually that of comparative statics. We first analyze two extreme cases; one in which C is very high and one in which C equals zero. Later we discuss intermediate cases.

Suppose C, the cost of reforming, is infinite. As investors change from neutral to green ($\frac{I_g}{I}$ goes from 0 to 1), firms with polluting technologies never find it optimal to reform since the cost of doing so is always too large. This results in the price and investment level of the polluting firms dropping, as the demand for their shares decreases. Since the demand for the shares of the clean firms is relatively constant, because both the green and neutral investors hold shares of clean firms, total investment in the economy also falls. In this extreme case the green investors have the largest negative impact on total investment in the economy.

The other extreme case is one in which $C = 0$. Then, when reforming is costless, firms with polluting technologies start switching to reformed, making them acceptable to green investors, as soon as $\frac{I_g}{I}$ is positive. As we formally show later, when $C = 0$, the rate at which polluting firms switch to reformed is a linear function of the number of green investors. This strong result implies that green investors have no *real* effect on the economy other than reforming polluting firms. As neutral investors are switching to green ($\frac{I_g}{I}$ goes from 0 to 1) polluting firms are reforming at a proportional rate that perfectly satisfies the diversification needs of green investors. Reformed firms are very valuable to green investors because by holding them they can gain access to the polluting technology. Moreover, only green investors hold reformed firms. But when $C = 0$, the linearity of the reformation rate implies that there is never a shortage or

surplus in the supply of reformed firms per green investor. As a result, their share prices and investment levels remain constant for any proportion of green investors as does the total investment in the economy.

In order to discuss less extreme cases of reforming costs we first define I_g^* as the level in which the first polluting firm switches to reformed. For $I_g \leq I_g^*$ the number of reformed firms, N_r, equals zero and then rises to $N_r = .5$ when $\frac{I_g}{I} = 1$. Intermediate cases are those with reforming costs C $(0 < C < \infty)$, such that $0 < I_g^* < 1$. Every intermediate case can be divided to two phases related to the two extreme cases described above.

An intermediate case always begins with a phase that resembles the $C \to \infty$ case. In this phase, since the benefits of avoiding being boycotted by the green investors do not compensate for the reforming costs, no firm reforms. Consequently, the price and investment level of the polluting firms and the total investment in the economy drop.

At I_g^* firms start to reform and the intermediate case enters its second phase. There are two differences between this phase and the $C = 0$ case described above. First, in the $C = 0$ case $I_g^* \approx 0$ while intermediate cases have $I_g^* > 0$. The second difference is that while in the $C = 0$ case the reformation rate is linear, in the second phase of intermediate cases the reformation rate is convex. These two differences yield interesting results as we further explain.

Recall that holding shares of reformed firms is valuable for green investors as these shares provide diversification benefits. However, since in intermediate cases $I_g^* > 0$, reformed firms first appear only after some mass of green investors is already present. Once the first polluting firm switches to reformed, its shares are in high demand by the green investors, which results in a high price and high investment level. One can also view this situation as a shortage in supply of reformed firms relative to the $C = 0$ case where the number of reformed firms is proportional to the number of green investors and diversification benefits are

always at an optimum. The convexity of the reformation rate implies that this relative shortage in reformed firms disappears only when all firms have reformed and all investors are green, at $\frac{I_g}{I} = 1$.

This results in the economy exhibiting its maximum total investment at the extremes when $\frac{I_g}{I} = 0$ or $\frac{I_g}{I} = 1$. Any fraction of green investors between 0 and 1 yields lower investment levels. The Social Investing Forum estimates that more than one out of every nine dollars under professional management in the United States today is involved in socially responsible investing. If we use these estimates as an approximation for the proportion of green investors in the population, we conclude that this investment practice is decreasing the total investment in the economy and that an increase in the proportion of green investors from its current level will result in an additional decrease in total investment.

2.2 The Model

Firms As discussed above, there are three categories of firms: *clean*, *polluting* and *reformed*, denoted c, p and r, respectively; there are N_i firms of type i, $i \in \{c, p, r\}$ and N firms in total. A polluting firm that reforms switches to the reformed class by paying a fixed cost of C. This means that it will retain its polluting technology, but will be acceptable for investment by green investors.[3]

Firm's i output is given by the following production technology: $\tilde{Y}_i = F_i \tilde{X}_i$ where $F_i = K_i^{\gamma_i}$ $(\gamma_i < 1)$ and $\tilde{X}_i \sim N(\mu_i, V_i)$. The fact that reformed firms retain their polluting technologies, implies: $\gamma_r = \gamma_p$. The covariance between $\tilde{X}_i$ and $\tilde{X}_j$ is denoted by $V_{i,j}$ and the correlation by $\rho_{i,j}$. We assume that the outputs of firms of the same type are perfectly correlated with each other.

[3] We solved three different cases for the reformed firms. In the first one, the reformed firms retain their polluting technology, in the second, the reformed firms switch to a clean technology and in the third, the reformed firms adopt a reformed technology that is somewhere between the clean and polluting technologies. In this paper we present the case in which the reformed firms retain their polluting technology to avoid confusing the issue by introducing diversification benefits to both the green and the neutral investors.

An entrepreneur of a firm of type i, $\quad i \in \{c, p, r\}$ chooses an investment level K_i, that maximizes his net present value, $\{P_i - K_i\}$. The entrepreneurs in our economy are not price takers with respect to their own share prices. If they were, they would simply choose $K_i^* = 0$ to maximize $P_i - K_i$ for fixed P_i. We do assume, however, that each entrepreneur takes the investment decisions of other entrepreneurs as given so that the investment level of each industry is not set in a collusive way. Therefore, the first order conditions are taken with respect to the specific K_{ji}, of entrepreneur j.

In order to demonstrate how the FOCs are taken, consider for example equation (II.7) which represents the price of one share of each clean firm (they are all identical). K_c appears twice in this equation: as the first variable and inside the brackets multiplied by N_c, the total size of the industry which is composed of many firms.

$$P_c = K_{1c}^{\gamma_c}\left[\mu_c - \frac{1}{(I_g + I_n)\,\tau}\left(\underbrace{K_c^{\gamma_c} N_c}_{\alpha_1 K_{1c}^{\gamma} + \alpha_2 K_{2c}^{\gamma} + \alpha_3 K_{3c}^{\gamma} + \ldots} V_c + K_r^{\gamma_p} N_r V_{c,p} + K_p^{\gamma_p} N_p V_{c,p}\right)\right] \tag{II.1}$$

Although in equilibrium all entrepreneurs in the clean industry choose the same K_c^*, from the point of view of a single entrepreneur a more accurate representation of the term $K_c^{\gamma_c} N_c$ is $\alpha_1 K_{1c}^{\gamma} + \alpha_2 K_{2c}^{\gamma} + \alpha_3 K_{3c}^{\gamma} + ...$, where α_j is the weight of firm j in the clean industry and $N_c = \sum_j \alpha_j$. In other words, a single entrepreneur, say entrepreneur 1, chooses his optimal level of investment, K_{1c}^*, taking all other $K_c's$ as given. Failing to do so by taking the FOC with respect to some general K_c, creates a cartel effect that we want to avoid. It would be like setting one optimal K_c^* for the whole industry in a collusive way because the total output of the industry is taken into account in the maximization decision of every single entrepreneur.

We further assume that each industry is composed of many identical firms and that each one is sufficiently small ($\alpha_j \approx 0$) such that the derivative with respect

to $\alpha_j K_{jc}^{\gamma}$ is negligible and hence, we ignore it.

Investors and Green Screening There are two types of investors: neutral and green, denoted n and g, respectively. There are I_k investors of type k and I investors in total. Neutral investors are willing to invest in all types of firms but green investors refuse to hold shares in polluting firms. Each investor has constant absolute risk aversion (CARA) preferences (i.e., negative exponential utility) with a risk tolerance parameter denoted by τ.

Based on the assumptions of normally distributed output and CARA preferences, a representative neutral investor has the following expected utility function:

$$U_n = x_{nc}F_c\mu_c + x_{np}F_p\mu_p + x_{nr}F_r\mu_p - \frac{x_{nc}^2F_c^2V_c + x_{np}^2F_p^2V_p + x_{nr}^2F_r^2V_p}{2\tau} \quad \text{(II.2)}$$
$$- \frac{[2x_{nc}x_{np}F_cF_pV_{cp} + 2x_{nc}x_{nr}F_cF_rV_{cp} + 2x_{nr}x_{np}F_rF_pV_p]}{2\tau}$$
$$-(x_{nc} - \omega_{nc})P_c - (x_{nr} - \omega_{nr})P_r - (x_{np} - \omega_{np})P_p$$

A representative green investor has the following expected utility function (with $x_{gp} = 0$):

$$U_g = x_{gc}F_c\mu_c + x_{gr}F_r\mu_p - \frac{[x_{gc}^2F_c^2V_c + x_{gr}^2F_r^2V_p + 2x_{gc}x_{gr}F_cF_rV_{cp}]}{2\tau} \quad \text{(II.3)}$$
$$-(x_{nc} - \omega_{nc})P_c - (x_{nr} - \omega_{nr})P_r$$

where, x_{ij}, $i \in \{n, g\}$, $j \in \{c, r, p\}$ is the number of shares of firm j held by investor i and ω_{ij}, $i \in \{n, g\}$, $j \in \{c, r, p\}$ is the number of shares of firm j endowed to investor i.

Time Line of Events Our model is a one period model, but it is useful to imagine the actions taking place in the following sequence of events. First, the polluting

firms decide whether to reform or not and the entrepreneurs sell shares to investors. After raising the funds, the entrepreneurs invest K_c, K_r, K_p (the amount that they were committed to) using the capital that was raised by issuing shares. The entrepreneurs of reformed firms also pay C out of the funds raised from the share issue. Lastly, future outputs $\tilde{Y}_c, \tilde{Y}_r, \tilde{Y}_p$ are revealed and distributed to the investors.

Equilibrium The market clearing conditions are:

$$I_n x^*_{nc} + I_g x^*_{gc} = N_c \tag{II.4}$$

$$I_n x^*_{nr} + I_g x^*_{gr} = N_r \tag{II.5}$$

$$I_n x^*_{np} = N_p \tag{II.6}$$

In order to have no arbitrage we must prohibit short selling of reformed shares by the neutral investors. Otherwise, the neutral investors could short the reformed firms and buy the polluting firms. Since the latter use exactly the same technology but their share price is lower (when there are positive reforming costs), neutral investors could earn a riskless arbitrage profit. Therefore, in equilibrium we set $x^*_{nr} = 0$.

The resulting equilibrium prices are:

$$P_c = K_c^{\gamma_c}\left[\mu_c - \frac{1}{(I_g + I_n)\,\tau}\left(K_c^{\gamma_c} N_c V_c + K_r^{\gamma_p} N_r V_{c,p} + K_p^{\gamma_p} N_p V_{c,p}\right)\right] \tag{II.7}$$

$$P_p = K_p^{\gamma_p}\left[\mu_p - \frac{1}{(I_g + I_n)\,\tau}\left(K_c^{\gamma_c} N_c V_{c,p} + K_p^{\gamma_p} N_p V_p + K_r^{\gamma_p} N_r \frac{V_{c,p}^2}{V_c} + K_p^{\gamma_p} N_p \frac{I_g}{I_n}\frac{\phi}{V_c}\right)\right] \tag{II.8}$$

$$P_r = K_r^{\gamma_p}\left[\mu_p - \frac{1}{(I_g + I_n)\,\tau}\left(K_c^{\gamma_c} N_c V_{c,p} + K_r^{\gamma_p} N_r V_p + K_p^{\gamma_p} N_p \frac{V_{c,p}^2}{V_c} + K_r^{\gamma_p} N_r \frac{I_n}{I_g}\frac{\phi}{V_c}\right)\right] \tag{II.9}$$

where $\phi = V_c V_p - V_{c,p}^2$

A Nash equilibrium is a solution that satisfies the following conditions:

1. $\partial P_i/\partial K_i = 1, \quad i \in \{c, p, r\}$ (first order condition for maximizing net present value)
2. $(P_p - K_p^*) = (P_r - K_r^*) - C$ (gain from reforming just covers fixed reforming cost)

The solutions to these four equations give the optimal investment levels $\{K_c^*, K_r^*, K_p^*\}$ and the number of polluting firms that reform in equilibrium, N_r^*.

An interesting observation is that the price and investment level of the clean firms, P_c and K_c are relatively insensitive to the number of green investors, that is, $\frac{\partial P_c}{\partial I_g} \approx 0$ and $\frac{\partial K_c}{\partial I_g} \approx 0$. The reason is that in the price equation of the clean firms, equation II.7, I_g does not appear as a direct parameter. Therefore, P_c depends on I_g only through a second order effect from N_r, N_p, K_r and K_p. Using numerical simulations we verified that this secondary effect is indeed very small. This result is similar to HKZ (2001) where the price of the clean firms is completely independent of I_g.

2.3 Examples of Different Reforming Costs

The complexity of the equilibrium conditions does not allow us (except in some cases) to get analytical solutions for the optimal investment levels and for N_r^*, the number of firms that reform in equilibrium. Therefore, in order to explore the model's predictions we solve it numerically. We present two extreme cases and two intermediate cases. The two extreme cases that we analyze are one in which C is very high ($C \to \infty$) and one in which C equals zero.

Calibration We present a case with infinite reforming costs, as well as three cases in which reforming costs vary from 0% to 10% of the investment levels $\{K_c^*, K_r^*, K_p^*\}$. The resulting cost of capital in equilibrium in the zero and intermediate cases is in the range of 4% to 12% for each type of firm.

Parameters:

Technology: $\gamma_c = \frac{1}{2}; \quad \gamma_p = \frac{1}{2};$

Random shocks' means: $\mu_c = 1; \quad \mu_p = 1$

Random shocks' variances: $V_c = 1; \quad V_p = 1$

Correlation and covariance: $\rho_{c,p} = 0.70; \quad \Rightarrow \; V_{c,p} = \rho_{c,p}\sqrt{V_c}\sqrt{V_p} = 0.7$

Risk tolerance: $\tau = 5$

Initial proportion of firms[4]: $N_c = 0.5, \quad N_p = 0.5$

Investors: $I = I_g + I_n = 1$

Infinite Reforming Costs ($C \to \infty$) When there are infinite reforming costs, there is no option for polluting firms to reform. This is the case in which the green investors' impact is the largest. As the number of investors who boycott the polluting firms increases, the demand for polluting firms falls and their price drops. An alternative way to describe it would be from the side of the neutral investors. As the number of neutral investors decreases, and since polluting firms never reform, a smaller group of neutral investors is forced to hold the fixed supply of polluting firms. As this group gets smaller, the price of the polluting firms must get lower and lower in order to compensate that group for the extra risk that it is bearing. The decrease in the price of the polluting firms is accompanied by a decrease in the investment level of these firms and as a result, a decrease in the total investment of the economy. Figure II.1 shows the total investment in the economy (defined as $N_cK_c + N_pK_p$) as a function of I_g for the infinite reforming costs case.

Zero Reforming Cost ($C = 0$) We define I_g^* to be the critical level of green investors at which the first firm reforms. When there are no reforming costs, the reformation process starts immediately, that is, I_g^* equals zero.

In the absence of reforming costs, there is a frictionless flow of firms from

[4]KLD (Kinder, Lydenberg, Domini and Co.) have constructed the Domini 400 Social Index, which is a portfolio of 400 ethically screened stocks. Out of the 500 stocks that compose the S&P 500 index, 252, or about 50%, have passed the KLD ethical screening.

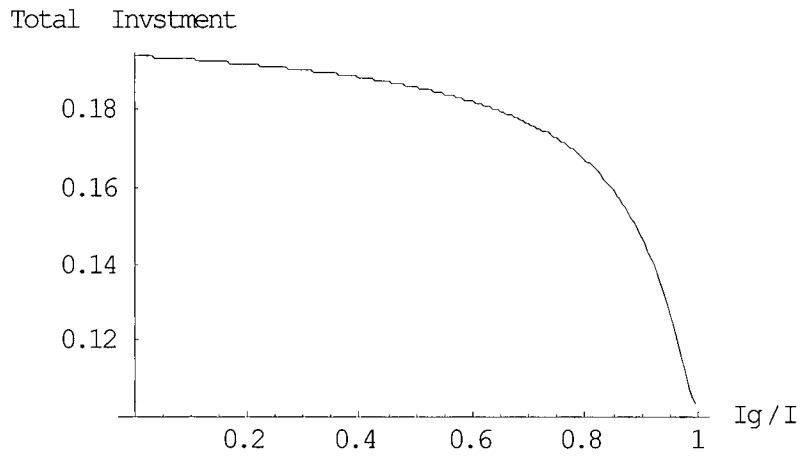

Figure II.1: Total investment in the economy as a function of I_g when $C \to \infty$

the polluting category to the reformed one. As soon as some neutral investors switch to green, some polluting firms find it beneficial to reform, at no cost, and avoid being boycotted by the green investors. As reflected in Figure II.2, the reforming process starts as soon as some neutral investors become green ($I_g^* = 0$), and continues at a linear rate until all investors are green and all polluting firms have reformed. We summarize this intuition more formally in the following propositions.

Proposition 1 *When reforming costs are zero, the rate at which polluting firms reform is a linear function of the number of green investors. Specifically,* $N_r = \frac{1}{2} I_g$.

Proof. Using our argument from section 2.2, the first order conditions in equations (II.7)-(II.8) are taken only with respect to the first component, K_i $i \in \{c, r, p\}$. Therefore, the FOC for firm i is:

$$1 = \frac{\partial P_i}{\partial K_i} = \gamma_i K_i^{\gamma_i - 1} \frac{P_i}{K_i^{\gamma}} = \gamma_i \frac{P_i}{K_i} = \frac{P_i}{2K_i} \text{ (Since } \gamma_i = \tfrac{1}{2} \equiv \gamma \quad \forall i)$$

$$\Rightarrow P_i = 2K_i \quad i \in \{c, r, p\}.$$

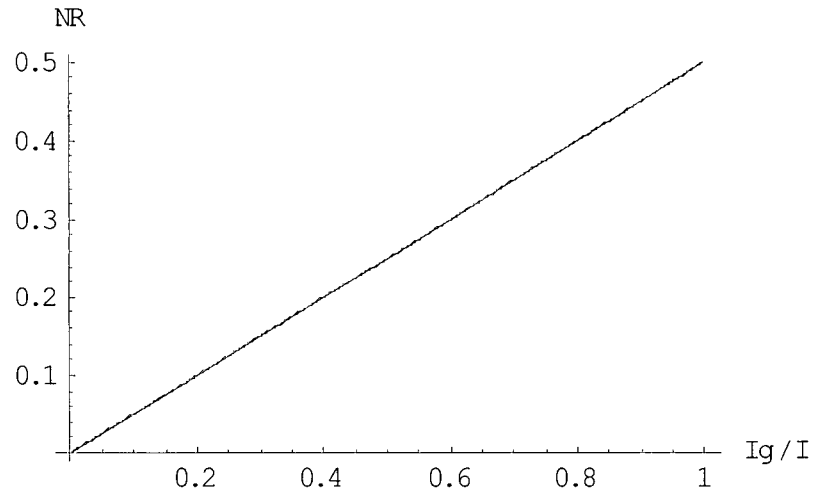

Figure II.2: The number of reformed firms, N_R, as a function of I_g when $C \to 0$

Note that $C = 0$, $P_r = 2K_r$ and $P_p = 2K_p$ applied to equilibrium condition 2: $(P_p - K_p^*) = (P_r - K_r^*) - C$, yields $P_r = P_p$ and $K_r = K_p \equiv K$.

We use this to solve equations (II.8)=(II.9) for N_r :

$$K^\gamma \left[\mu_p - \frac{1}{(I_g+I_n)\tau}\left(K_c^\gamma N_c V_{c,p} + K^\gamma N_r V_p + K^\gamma N_p \frac{V_{c,p}^2}{V_c} + K^\gamma N_r \frac{I_n}{I_g}\frac{\phi}{V_c}\right)\right] =$$

$$K^\gamma \left[\mu_p - \frac{1}{(I_g+I_n)\tau}\left(K_c^\gamma N_c V_{c,p} + K^\gamma N_p V_p + K^\gamma N_r \frac{V_{c,p}^2}{V_c} + K^\gamma N_p \frac{I_g}{I_n}\frac{\phi}{V_c}\right)\right]$$

$$\Rightarrow K^\gamma N_r V_p + K^\gamma N_p \frac{V_{c,p}^2}{V_c} + K^\gamma N_r \frac{I_n}{I_g}\frac{\phi}{V_c} = K^\gamma N_p V_p + K^\gamma N_r \frac{V_{c,p}^2}{V_c} + K^\gamma N_p \frac{I_g}{I_n}\frac{\phi}{V_c} \text{ (divide by } K^\gamma)$$

$$\Rightarrow N_r V_p + N_p \frac{V_{c,p}^2}{V_c} + N_r \frac{I_n}{I_g}\frac{\phi}{V_c} = N_p V_p + N_r \frac{V_{c,p}^2}{V_c} + N_p \frac{I_g}{I_n}\frac{\phi}{V_c} \text{ (use } N_p = \tfrac{1}{2} - N_r)$$

$$\Rightarrow \left(2N_r - \tfrac{1}{2}\right) V_p + \left(\tfrac{1}{2} - 2N_r\right)\frac{V_{c,p}^2}{V_c} + N_r \frac{I_n}{I_g}\frac{\phi}{V_c} = \left(\tfrac{1}{2} - N_r\right)\frac{I_g}{I_n}\frac{\phi}{V_c} \text{ (use } \phi = V_c V_p - V_{c,p}^2)$$

$$\Rightarrow \left(2N_r - \tfrac{1}{2}\right)\frac{\phi}{V_c} + N_r \frac{I_n}{I_g}\frac{\phi}{V_c} = \left(\tfrac{1}{2} - N_r\right)\frac{I_g}{I_n}\frac{\phi}{V_c} \text{ (divide by } \tfrac{\phi}{V_c})$$

$$\Rightarrow \left(2N_r - \tfrac{1}{2}\right) + N_r \frac{I_n}{I_g} = \left(\tfrac{1}{2} - N_r\right)\frac{I_g}{I_n}$$

$$\Rightarrow N_r = \frac{\frac{1}{2}\left(\frac{I_g}{I_n} + 1\right)}{2 + \frac{I_n}{I_g} + \frac{I_g}{I_n}} = \frac{\frac{1}{2}\left(\frac{I_g+I_n}{I_n}\right)}{\frac{(I_g+I_n)^2}{I_g I_n}} \text{ (use } I_g + I_n = 1)$$

$$\Rightarrow N_r = \tfrac{1}{2} I_g$$

QED. ■

Proposition 2 *When reforming costs are zero, the economy is independent of the number of green investors. The share prices and investment levels of all firms are equal and constant for every level of* $\frac{I_g}{I}$.

Proof. We substitute the result of proposition 1 in the FOCs of equations (II.7) and (II.8) to show that the optimal investment levels are constant for every level of I_g and therefore, total investment in the economy is constant. Start with the FOC for P_c :

$$\Rightarrow 1 = \frac{P_c}{2K_c} = \tfrac{1}{2}K_c^{\gamma_c - 1}\left[\mu_c - \frac{1}{(I_g + I_n)\,\tau}\left(K_c^{\gamma_c} N_c V_c + K_r^{\gamma_p} N_r V_{c,p} + K_p^{\gamma_p} N_p V_{c,p}\right)\right]$$

(use $K_r = K_p \equiv K$, $\gamma_c = \gamma_p \equiv \gamma$ and $N_p = \frac{1}{2} - N_r$)

$$\Rightarrow 1 = \tfrac{1}{2}K_c^{\gamma-1}\left[\mu_c - \frac{1}{(I_g + I_n)\,\tau}\left(K_c^{\gamma} N_c V_c + K^{\gamma}\tfrac{1}{2} V_{c,p}\right)\right]$$

(use $I_g + I_n = 1$ and $N_c = \frac{1}{2}$)

$\Rightarrow$

$$1 = \frac{1}{2}K_c^{\gamma-1}\left[\mu_c - \frac{1}{\tau}\left(K_c^{\gamma}\frac{1}{2}V_c + K^{\gamma}\frac{1}{2}V_{c,p}\right)\right] \tag{II.10}$$

$\Rightarrow K_c^*$ is a function of constants $(\mu_c, \tau, V_c, V_{c,p})$ and K, independent of I_g.

The FOC for P_p :

$$1 = \frac{P_p}{2K_p}$$

$$= \tfrac{1}{2}K_p^{\gamma-1}\left[\mu_p - \frac{1}{(I_g + I_n)\,\tau}\left(K_c^{\gamma} N_c V_{c,p} + K_p^{\gamma} N_p V_p + K_r^{\gamma} N_r \tfrac{V_{c,p}^2}{V_c} + K_p^{\gamma} N_p \frac{I_g}{I_n}\frac{\phi}{V_c}\right)\right]$$

(use $K_r = K_p = K$, $N_r = \frac{1}{2}I_g$ and $N_p = \frac{1}{2} - N_r = \frac{1}{2}(1 - I_g) = \frac{1}{2}I_n$)

$$\Rightarrow 1 = \tfrac{1}{2}K_p^{\gamma-1}\times$$

$$\left[\mu_p - \frac{1}{(I_g + I_n)\,\tau}\left(K_c^{\gamma} N_c V_{c,p} + K^{\gamma}\tfrac{1}{2}(1 - I_g)\,V_p + K^{\gamma}\tfrac{1}{2} I_g \tfrac{V_{c,p}^2}{V_c} + K^{\gamma}\tfrac{1}{2} I_n \frac{I_g}{I_n}\frac{\phi}{V_c}\right)\right]$$

$$\Rightarrow 1 = \tfrac{1}{2}K_p^{\gamma-1}\left[\mu_p - \frac{1}{\tau}\left(K_c^{\gamma}\tfrac{1}{2}V_{c,p} + K^{\gamma}\tfrac{1}{2}V_p + K^{\gamma}\tfrac{1}{2}I_g\left(\tfrac{V_{c,p}^2}{V_c} - V_p\right) + K^{\gamma}\tfrac{1}{2}I_g\tfrac{\phi}{V_c}\right)\right]$$

$$\Rightarrow 1 = \tfrac{1}{2}K_p^{\gamma-1}\left[\mu_p - \frac{1}{\tau}\left(K_c^{\gamma}\tfrac{1}{2}V_{c,p} + K^{\gamma}\tfrac{1}{2}V_p - K^{\gamma}\tfrac{1}{2}I_g\left(\tfrac{\phi}{V_c}\right) + K^{\gamma}\tfrac{1}{2}I_g\tfrac{\phi}{V_c}\right)\right]$$

$\Rightarrow$

$$1 = \frac{1}{2}K_p^{\gamma-1}\left[\mu_p - \frac{1}{\tau}\left(K_c^{\gamma}\frac{1}{2}V_{c,p} + K^{\gamma}\frac{1}{2}V_p\right)\right] \tag{II.11}$$

$\Rightarrow K_p^* = K_r^* \equiv K^*$ is a function of constants $(\mu_p, \tau, V_p, V_{c,p})$ and K_c, independent of I_g.

Solving the system of equations (II.10) and (II.11) yield unique close form solutions for K_c^* and K^* which are constant and independent of I_g. Moreover, as long as as $\mu_p = \mu_c$, $V_p = V_c$ and $\gamma_c = \gamma_p$ as in our calibration in section 2.3, $K_c^* = K_p^* = K_r^* \ \forall I_g$ which also implies $P_c^* = P_p^* = P_r^* \ \forall I_g$.

QED. ■

We focus on the analysis of investment levels. As the first neutral investor becomes green, he divests his holdings in the polluting firms. By doing so, he loses the diversification benefit of holding both technologies. This green investor has a potential demand for shares of reformed firms (if they existed) because these shares offer him access to the polluting technology. Simultaneously, some of the polluting firms suffer from the divestment of their shares by green investors. But since reforming is costless, some polluting firms immediately reform in order to fill the demand for reformed firms and avoid being boycotted by the green investors.

As stated formally above, this results in a linear reformation process which begins as soon as the first green investor appears. Consequently, the price and investment levels of the reformed firms, P_r and K_r, equal those of the polluting firms and overall investment in the economy, defined as $\sum_{i=c,r,p} N_i K_i$, remains constant for every level of I_g.

Intermediate Cases $(0 < C < \infty)$ When reforming is costly, polluting firms do not find it optimal to reform as soon as the first green investor appears. The aggregate effect of green investors boycotting the polluting firms on their share price has to be large enough to compensate for paying the reforming costs and this is not usually the case when I_g is small. In the previous subsections we discussed two extreme cases. One, when the cost to reform is infinite and firms

never find it optimal to reform and second, when the cost to reform is zero and firms start to reform as soon as the first green investor appears. Here, we discuss intermediate cases in which reforming costs are positive but not so high that firms never reform. Then, there will be a critical mass of green investors, I_g^*, at which the first firm reforms.

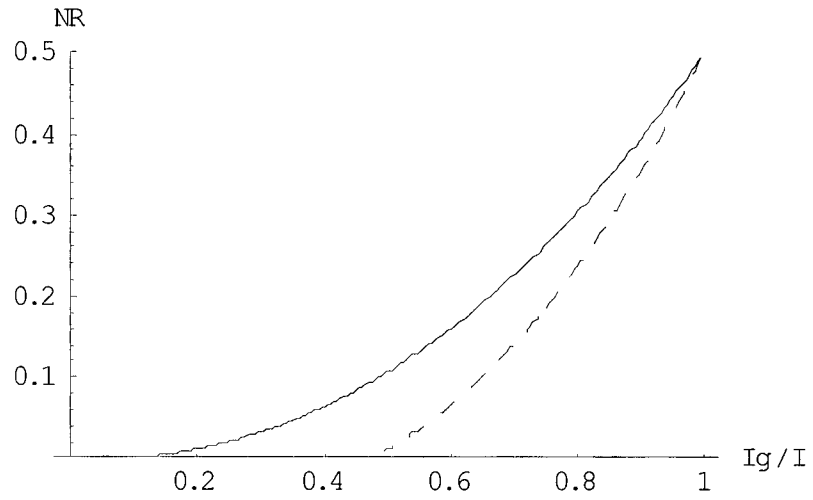

Figure II.3: The number of reformed firms, N_R, as a function of I_g in intermediate cases. Dashed line: reforming cost = 10%; Solid line: reforming cost = 6%

An interesting observation is that in intermediate cases, an economy that has no green investors ($I_g = 0$) and an economy that has only green investors ($I_g = 1$) have the same investment levels and share prices. Formally, $P_c(I_g = 0) = P_c(I_g = 1)$, and $P_p(I_g = 0) = P_r(I_g = 1)$. The reason for this symmetry is the following: at $I_g = 0$, there are only neutral investors in the economy and two types of firms, clean and polluting. At $I_g = 1$, there are only green investors in the economy and two types of firms, clean and reformed. Since the reformed firms and the polluting firms are using the same technology (polluting), the two economies described above are essentially the same.[5] This implies identical

[5]The economy with $I_g = 1$ has incurred $N_p C$ in fixed costs, to reform all polluting firms.

outcomes in terms of prices and investment levels in the two economies.

Figure II.3 demonstrates two examples of intermediate cases with different reforming costs that represent six and ten percent of total investment. When reforming costs equal six percent of investment, $I_g^* \approx 0.15$ and when they are ten percent, $I_g^* \approx 0.5$.

We view every intermediate case as if it is divided into two different regimes; the first when $0 < I_g < I_g^*$ and the second when $I_g^* < I_g < I$.

The first phase is identical to the $C \to \infty$ case described earlier. As more investors switch from neutral to green, they divest their holdings in the polluting firms and increase their demand for the clean firms. This drives down P_p and K_p, the share price and investment of the polluting firms, and pushes up slightly the price and investment of the clean firms. Since the effect on the polluting firms is much larger than that on the clean firms, total investment in the economy falls.

At some point in the process $\left(I_g = I_g^*\right)$, polluting firms start to reform and a third category of firms is created: reformed firms that use the polluting technology. From here, we move to the second phase. The actual behavior of total investment in this phase depends on the size of the reforming costs, which determines the level of I_g^*.

When reforming costs are high, I_g^* is also high; for example, in the case presented here, reforming costs of ten percent of investment result in $I_g^* \approx 0.5$. The high level of I_g^* implies that the reformation process, once begun, will be relatively fast. This happens because at $I_g = 1$ the number of polluting firms must equal 0 (as there are no neutral investors) and therefore, the number of reformed firms must change from 0 to $\frac{1}{2}$ as I_g goes from I_g^* to $I_g = 1$. This rate of reformation is higher than in a case where I_g^* is closer to 0.

The intensity of the reformation rate is translated into an increase in the total investment in the economy. The reformed firms are very valuable to the green investors and therefore their price and investment level are higher than those

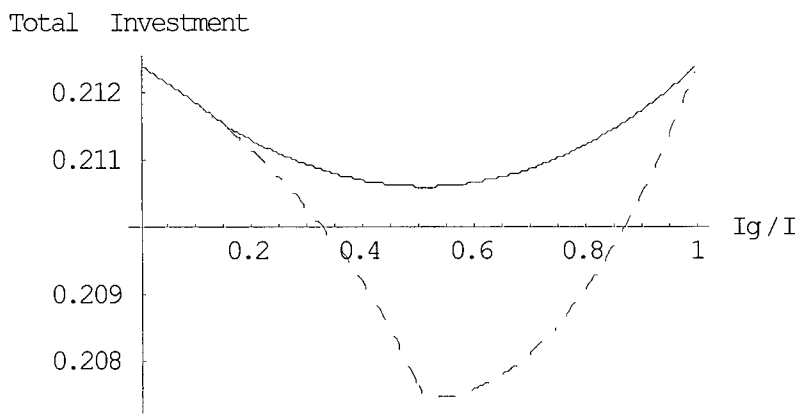

Figure II.4: Total investment for intermediate cases. Dashed line: reforming cost = 10%; Solid line: reforming cost = 6%

of the polluting firms, which are less valuable to investors due to their larger supply. In the reformation process, every polluting firm with low investment level is replaced with a reformed one with a high investment level and since the rate of reformation is high, total investment goes up.

A lower reformation cost of approximately six percent of the initial investment, results in a lower value of $I_g^* \approx 0.15$. The prices and investment levels of the reformed and polluting firms exhibit similar behavior to the case of high reforming costs. With respect to total investment, the behavior is a little bit more complicated, as reflected in Figure II.4.

The difference is that the total investment doesn't increase immediately at I_g^* as it did with higher reforming costs. This happens because around I_g^*, the rate of firms reforming is very low, and the supply of reformed firms is so small that every new green investor who divests his holding in the polluting firms creates mainly demand for the clean firms. Total investment eventually recovers, but only when the rate of reformation increases.

In order to better understand why the change in total investment can be positive or negative as I_g passes I_g^*, we need to consider the marginal changes in each industry's investment. Since the clean industry investment is almost constant, as we argued earlier, this means that the variation comes from industries r and p, specifically from the sum of the changes in the two. The sum of the investments in industries r and p is simply $S_{r,p} = N_r K_r + N_p K_p$. The term that we are interested in is $\frac{dS_{r,p}}{dI_g}$, the total derivative of the sum with respect to the number of green investors. As the following sign calculation shows, the sign of the total derivative is not clear.

$$\text{sign}\left(\frac{dS_{r,p}}{dI_g}\right) = \underbrace{\underbrace{(K_r - K_p)}_{(+)}\underbrace{\frac{\partial N_r}{\partial I_g}}_{(+)}}_{(+)} + \underbrace{\underbrace{N_r\frac{\partial K_r}{\partial I_g}}_{(-)} + \underbrace{N_p\frac{\partial K_p}{\partial I_g}}_{(-)}}_{(-)} \gtreqless 0 \qquad \text{(II.12)}$$

When $I_g < I_g^*$, the decline in the polluting firm's investments has a major impact on the total investment (see Figure II.4). Once firms start to reform, polluting firms with low investment levels are replaced with reformed firms that invest much more, but this might not be enough to push the total investment up again. As equation II.12 shows, the sign of the total derivative also depends on the intensity of the reformation rate, $\frac{\partial N_r}{\partial I_g}$. If this rate is very small around I_g^*, as in the first intermediate case that we present here, total investment continues to drop in the beginning of the reformation process. On the other hand, if the reformation process is intense around I_g^*, as in the second intermediate case, total investment increases as soon as the first firm reforms.

To summarize, the rate at which the reformed industry replaces the polluting industry explains the patterns of the total investment in the economy. If the total derivative of the sum of changes in industries r and p switches signs, total investment continues to drop as I_g passes I_g^* and picks up at a later stage as total investment must be equal at $I_g = 0$ and $I_g = 1$.

Table II.1 summarizes the main results of the three cases that we discuss in

Case	Cost	Total Investment
Infinite reforming costs	$C \to \infty$	Maximum at $I_g = 0$
Zero reforming costs	$C = 0$	Constant $\forall I_g$
Intermediate cases	$0 < C < \infty$	Maximum at $I_g = 0$ or $I_g = 1$

Table II.1: Total investment in three different levels of reforming costs

section 2.3.

2.4 Conclusions

This chapter explores the effects of ethical screening on firms' decisions to reform and on their investment level. These issues are examined in an equilibrium setting with endogenous investment decisions and endogenous future outputs. The effects on total investment are examined in the presence of various levels of reforming costs.

The results of our model indicate that if reformation costs are infinite, ethical screening reduces total investment in the economy significantly. When reforming is costless, green investors have no impact at all and total investment remains constant for every level of $\frac{I_g}{I}$. In intermediate cases when reforming costs are positive but not so high that firms never reform, the economy exhibits its maximum total investment at the extremes, i.e., when there are either no green investors ($I_g = 0$) or when there are only green investors ($I_g = 1$).

No fraction of green investors strictly between 0 and 1 generates as much investment as all ($I_g = 0$) or none ($I_g = 1$). For relatively low I_g, say around 10% to 12% as estimated to be the fraction of total managed funds which are subject to SRI strategies, increasing I_g lowers total investment.

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CHAPTER III
DOING LESS BADLY BY DOING GOOD: CORPORATE SOCIAL RESPONSIBILITY

3.1 Introduction

The concept of *corporate social responsibility* (CSR) is becoming more prominent. Hopkins and Cowe (2004) portray CSR as defining the "ethical corporation," and categorize CSR as covering human rights, labor conditions, environmental impacts and health issues. Hopkins and Cowe (2004) point to events that indicate *non-shareholder stakeholders* are becoming increasingly aware of CSR. Increasing globalization makes local regulation of companies more difficult. The Earth Summit of 1992 and anti-globalization protests at the Seattle WTO meetings in 1999 indicate an increasing awareness of CSR. Hopkins and Cowe (2004) report the results of an international survey of CEOs which shows that 79% feel sustainability is necessary to maintain profitability. They report on evidence that *investors* are also becoming more CSR-sensitive.

Existing models of CSR behavior fall primarily into two camps. First, there are models where CSR expenditures improve operating income. For example, providing day-care facilities for employees may attract more productive employees, all else equal, leading to greater revenues and/or lower costs. In these models, CSR expenditures will increase (up to some point) share prices regardless of the ownership structure of the firm.

The second camp of CSR models assumes that CSR expenditures are made because the corporate decision-maker or other, non-shareholder, stakeholders feel better for having supported their community with CSR spending, even with no benefit to operating income. For example, a corporate executive may gain personal utility from donating corporate (i.e., shareholder) funds to sponsor a local little league team.

The model we develop here falls between these two camps. We assume that corporate executives are firm-value-maximizers, but CSR spending has no impact on operating income. Rather, the mix of heterogenous investors (some of whom value CSR and some of whom do not) in the economy leads to share prices that may react to CSR spending. If so, value-maximizing firms will make CSR expenditures.

Our paper considers the case of some fraction of investors valuing CSR; that is, some investors gain utility from owning companies that are active in CSR. We will show that investors' portfolio choices impact stock prices in a way that leads value-maximizing managers to make CSR expenditures.

CSR behavior may be viewed quite differently by investors when done by different firms. For firms with a "clean" technology, a healthy product and good labor relations, CSR expenditures may not have the same marginal impact on investors as CSR expenditures by a firm with a "polluting" technology, poor labor relations and an unhealthy product. The latter firm may still be viewed negatively by investors, but the CSR expenditure might have a greater marginal impact on investors than for the clean, healthy firm.

Why would investors react, in their financial decisions, to CSR? We hypothesize that investors gain utility from their own community involvement and also from corporate social expenditures, in proportion to their holdings in the firm. If an investor owns 5% of a company and it donates a dollar, that gives the investor utility that is equivalent to a personal donation of $.05.[1]

These social expenditures matter to investors. This means that these concepts will enter equilibrium prices, because investors portfolio decisions will be influenced by CSR activity.

How should investors react to a company that has a poor CSR record? They

[1]Of course, it is possible that the investor values $1 of CSR where he owns 5% of the firm by *more* than $.05 personal donations.

could not only avoid holding these firms in their portfolios, they could actually *short* the stock of firms with poor CSR performance. Alternatively, investors could continue to own the firms with poor CSR but use the wealth generated from their portfolio to support their community through personal donations.

There is little theoretical work in finance that explores equilibrium CSR behavior. Heinkel, Kraus and Zechner (2001) and Barnea, Heinkel and Kraus (2004) construct a model in which one class of investors is *assumed* to boycott a class of firms that do not meet their standards for anti-pollution efforts (or other social criteria). If enough investors boycott, the authors show that these neglectful firms can be induced to clean up.

Instead of assuming that one class of investors boycotts (has a zero position in) certain stocks, here we assume one class of investors ("altruistic") has utility from corporate social expenditures, as well as utility from personal social expenditures. This might allow investors to continue to hold stocks that have less-than-perfect social records (to benefit the investors' risk-sharing possibilities) while using their own wealth to gain utility from social expenditures.

Contrary to our assumption, Navarro (1988) and Webb (1996) make the assumption that corporate donations are part of the firm's advertising strategy. Navarro (1988) assumes that corporate CSR spending improves the quantity of sales of the firm's product at any price, while Webb (1996) assumes that CSR spending improves price, at any given output level. Webb (1996) focusses on the issue of corporate giving either directly or through a foundation, in a profit-maximization model. Navarro (1988) also focusses on profit maximization as the objective, but he also allows for the agency possibility that the manager gains personal benefits beyond the profit-maximizing level of CSR. Navarro (1988) examines comparative statics results of the profit-maximization equation, constrained by a takeover threat that limits the agency problem of CSR spending. Alternatively, our interest is in developing equilibrium implications by assuming

different types of value-maximizing firms and a market-clearing condition.

Barnea and Rubin (2005) test a model in which management makes CSR expenditures to maximize its own self interest, at the expense of shareholders. They find some evidence consistent with this agency story.

Small and Graff Zivin (2004) develop a simple model that shares some similarities to the one developed here. An investor with utility that is concave in consumption and donations (both hers and a corporation's) makes donations and invests in two riskless firms' shares. One firm makes a fixed donation and one does not. The investor consumes out of the end-of-period riskless cash flows from her shareholdings, less what she donates. There are no frictions in the model, such as taxes. In this simple world, Small and Graff Zivin (2004) develop a "Modigliani-Miller" irrelevance result. Suppose that the investor optimally wishes to donate. The two firms' share prices will be equal and they will be independent of the level of donation made by the donating corporation. The idea is that if the donating firm changes its donation level, the investor can offset the effect of this by altering her private donation. Our model below can duplicate this "irrelevance result" if we assume the conditions in Small and Graff Zivin (2004): (i) assume a riskless technology, (ii) fix exogenously the level of corporate investment and CSR spending, (iii) assume only one type of investor (our "altruistic" investors) and (iv) assume no taxes.

There are several interesting aspects to the resulting equilibrium in our model. When there are few altruistic investors, their preferences have little impact on market equilibrium and they find it utility-maximizing to short firms with poor CSR records. However, as the fraction of altruistic investors in the economy rises, they do wield market power and value-maximizing firms find it optimal to make CSR expenditures. Each altruistic investor makes personal social contributions that increase as the fraction of altruistic investors rises until, at very high fractions of altruistic investors, each investor reduces her donation level. The rate of

increase in personal donations as the fraction of altruistic investors rises diminishes once firms begin CSR expenditures. Firms do not undertake CSR spending at low fractions of altruistic investors, but do as that fraction rises. If there are caps to the tax break provided for CSR spending, firms may continue to increase their CSR spending as the fraction of altruistic investors rises, even without the tax break.

Social surplus, defined as the total economy-wide social spending (corporate CSR and personal donations) less the tax breaks given for such spending, is increasing in the fraction of altruistic investors. We examine the tax break policy and its impact on social surplus. For example, at an intermediate level of altruistic investors, social surplus is monotonically decreasing in the tax break given to individuals; an additional dollar of tax break generates less than a dollar of new giving. On the other hand, social surplus is non-monotonic and concave in the corporate tax break given to CSR. At low tax breaks, increasing the tax break by one dollar generates more than one dollar in new CSR and personal giving. This reverses when the tax break is larger.

3.2 The Model

There are two types of firms: there are N_g *good* firms that, because of their technology, have better corporate social responsibility (CSR) attributes at any social expenditure level than *bad* firms. These fundamentally good firms make social expenditures of D_g each. There are N_b *bad* firms that, because of their technologies, are seen as fundamentally poorer at any level of social expenditure than good firms. Each *bad* firm can improve its social commitment by making corporate social expenditures of D_b. The entrepreneurs of a firm type j, $j \in \{b, g\}$ can raise K_j dollars, of which $K_j - D_j$ is invested in a production technology that produces normally distributed end-of-period cash flows to investors. The

expected end-of-period cash flow of a firm of type j is

$$\mu_j = k_1(K_j - D_j) - (1/2)k_2(K_j - D_j)^2 \tag{III.1}$$

There are two types of investors: there are I_n *neutral* investors who care only about their financial portfolios, i.e., they ignore CSR behavior; there are also I_a *altruistic* investors who do care about CSR and the dollar equivalent of their utility is enhanced by CSR behavior in the amount $W(D_b, D_g, D_I, x_{ab}, x_{ag})$, where D_I is the donation made by each altruistic investor and x_{ab} and x_{ag} are the number of bad and good firm shares held by an altruistic investor. We assume that altruistic investors have preferences that are separable over wealth and donations and all investors have CARA utility over terminal wealth. For convenience, we also assume that the riskless rate is zero.

Neutral investors choose shareholdings x_{nb} and x_{ng} in bad and good firms to maximize:

$$U_n = x_{ng}\mu_g + x_{nb}\mu_b - \frac{1}{2\tau}[x_{ng}^2\sigma_g^2 + x_{nb}^2\sigma_b^2 + 2x_{ng}x_{nb}\sigma_{bg}]$$
$$-(x_{ng} - \omega_{ng})P_g - (x_{nb} - \omega_{nb})P_b \tag{III.2}$$

where τ is the investor's risk tolerance.

Good and bad firms have standard deviations of ending cash flows of σ_g and σ_b and the two cash flows have a covariance of σ_{bg}. ω_{nb} and ω_{ng} are each neutral shareholder's endowment of shares in bad and good firms.

Altruistic investors choose shareholdings x_{ag} and x_{ab} in good and bad firms and their individual charitable donations, D_I, to maximize:

$$U_a = x_{ag}\mu_g + x_{ab}\mu_b - \frac{1}{2\tau}[x_{ag}^2\sigma_g^2 + x_{ab}^2\sigma_b^2 + 2x_{ag}x_{ab}\sigma_{bg}]$$
$$-(x_{ag} - \omega_{ag})P_g - (x_{ab} - \omega_{ab})P_b + W(D_b, D_g, D_I, x_{ab}, x_{ag}) - (1 - t_i)D_I \tag{III.3}$$

where t_i is the personal tax rebate provided to the donor for one dollar of donation.

We choose the following dollar-equivalent of the utility of altruistic investors for donations and corporate social expenditures.

$$W = \alpha_i[u_i D_I - (1/2)vD_I^2] + \alpha_b x_{ab}[u_b D_b - (1/2)vD_b^2 - w_b]$$

$$+\alpha_g x_{ag}[u_g D_g - (1/2)vD_g^2 - w_g] + \beta T - (1/2)\eta T^2 \qquad \text{(III.4)}$$

where $T = I_a D_I + N_b D_b + N_g D_g$ is total donations and corporate social expenditures, and α_i, α_b, α_g, β and η are positive constants.

The first term in W is the value to an altruistic investor from her personal donation, D_I, and the second and third terms represent the dollar-equivalent utility of corporate social expenditures by b and g firms. If x_{ab} or $x_{ag} = 0$, then that firm's corporate social expenditures do not benefit the altruistic investor (except through their inclusion in total expenditures, T). The last two terms represent the dollar-equivalent of utility for total corporate social expenditures and donations, $T = N_b D_b + N_g D_g + I_a D_I$.

The constants in W define the participants in this economy. Altruistic investors have $\alpha_j u_j > 1$, for $j = \{b, g\}$. As shown below, this means that altruistic investors' utility gains from corporate social expenditures will induce those expenditures at some level of altruistic investors, $\hat{I}_a < I$. $\beta > 0$ and $\eta > 0$ imply that altruistic investors have utility for total social expenditures, as well as for each expenditure separately. This induces some substitutability between personal donations and corporate social expenditures.

Good and bad firms have the same production technologies, but they differ in how altruistic investors view their operations. Specifically, we assume

$$u_b > u_g > u_i \geq v \qquad \text{(III.5)}$$

and

$$w_b > w_g > 0 \qquad \text{(III.6)}$$

For the same level of CSR expenditure by b and g firms, equation III.5 means that the expenditure by b firms generates more marginal utility for an altruistic investor than does the expenditure by g firms. Equation III.6 implies that, at low CSR expenditure levels, b firms provide lower utility to altruistic investors than does the same expenditure by a g firm. Thus, b firms are held in lower esteem by altruistic investors, but CSR expenditures by b firms have higher marginal utility than the same expenditure by a g firm.

Entrepreneurs sell the two technologies at their market values: good firms get P_g and bad firms get P_b. Both types of entrepreneurs choose K_j and D_j to maximize:

$$P_j + t_c[\Delta_j D_j + (1 - \Delta_j)\bar{D}_j] - K_j \tag{III.7}$$

where t_c is the corporate tax rebate provided by making one dollar of social expenditures[2], as long as the social expenditure is below some limit set by law (expressed in our model as a fraction of μ_j, expected ending cash flow), $\bar{D}_j = l_j \mu_j$. When CSR expenditures are below this limit, $D_j < \bar{D}_j$, then $\Delta_j = 1$, and when the expenditures exceed this limit, $\Delta_j = 0$ for $D_j \geq \bar{D}_j$.

3.3 Equilibrium

The investors' first order conditions are:

$$\frac{\delta U_n}{\delta x_{ng}} = \sigma_g^2 x_{ng} + \sigma_{bg} x_{nb} - \tau(\mu_g - P_g) = 0 \tag{III.8}$$

$$\frac{\delta U_n}{\delta x_{nb}} = \sigma_{bg} x_{ng} + \sigma_b^2 x_{nb} - \tau(\mu_b - P_b) = 0 \tag{III.9}$$

$$\frac{\delta U_a}{\delta x_{ag}} = \sigma_g^2 x_{ag} + \sigma_{bg} x_{ab} - \tau(\mu_g - P_g) - \tau\alpha_g G = 0 \tag{III.10}$$

$$\frac{\delta U_a}{\delta x_{ab}} = \sigma_{bg} x_{ag} + \sigma_b^2 x_{ab} - \tau(\mu_b - P_b) - \tau\alpha_b B = 0 \tag{III.11}$$

[2]Note that t_c applies only to CSR expenditures by the firm, as distinct from the firm's tax rate on net income. The latter is reflected in μ_j, which we hold constant in later comparative statics results from varying t_c.

where

$$B = u_b D_b - (1/2) v D_b^2 - w_b$$

and

$$G = u_g D_g - (1/2) v D_g^2 - w_g$$

from the W function.

$$\frac{\delta U_a}{\delta D_I} = \frac{\delta W}{\delta D_I} - (1 - t_i) = 0$$

or

$$\frac{\delta U_a}{\delta D_I} = \alpha_i (u_i - v D_i) + \beta I_a - \eta I_a T - (1 - t_i) = 0 \tag{III.12}$$

Solving equations III.8 through III.11 simultaneously gives:

$$x_{ng}^* = \frac{\tau}{\phi}[(\mu_g - P_g)\sigma_b^2 - (\mu_b - P_b)\sigma_{bg}] \tag{III.13}$$

$$x_{nb}^* = \frac{\tau}{\phi}[(\mu_b - P_b)\sigma_g^2 - (\mu_g - P_g)\sigma_{bg}] \tag{III.14}$$

$$x_{ag}^* = \frac{\tau}{\phi}[(\mu_g - P_g)\sigma_b^2 - (\mu_b - P_b)\sigma_{bg} + \alpha_g G \sigma_b^2 - \alpha_b B \sigma_{bg}] \tag{III.15}$$

$$x_{ab}^* = \frac{\tau}{\phi}[(\mu_b - P_b)\sigma_g^2 - (\mu_g - P_g)\sigma_{bg} + \alpha_b B \sigma_g^2 - \alpha_g G \sigma_{bg}] \tag{III.16}$$

where $\phi = \sigma_g^2 \sigma_b^2 - \sigma_{bg}^2$.

The market clearing conditions are:

$$I_n x_{ng}^* + I_a x_{ag}^* = N_g \tag{III.17}$$

$$I_n x_{nb}^* + I_a x_{ab}^* = N_b \tag{III.18}$$

Substituting the optimal shareholdings III.13 - III.16 into III.17 and III.18 yields the equilibrium prices:

$$P_b = \mu_b - \frac{1}{I\tau}[N_g \sigma_{bg} + N_b \sigma_b^2] + \frac{I_a}{I}\alpha_b B \tag{III.19}$$

$$P_g = \mu_g - \frac{1}{I\tau}[N_g \sigma_g^2 + N_b \sigma_{bg}] + \frac{I_a}{I}\alpha_g G \tag{III.20}$$

The price of good firms, P_g, is a positive function of the marginal utility, $\alpha_g G = \frac{\delta W}{\delta x_{ag}}$ and the price of bad firms, P_b, is a positive function of the marginal utility, $\alpha_b B = \frac{\delta W}{\delta x_{ab}}$, both multiplied by the fraction of altruistic investors in the economy, $\frac{I_a}{I}$.

Substituting these equilibrium prices back into the investors' shareholdings shows:

$$x^*_{nb} = \frac{N_b}{I} - (\frac{I_a}{I})(\frac{\tau}{\phi})[\alpha_b B\sigma_g^2 - \alpha_g G\sigma_{bg}] \tag{III.21}$$

$$x^*_{ng} = \frac{N_g}{I} - (\frac{I_a}{I})(\frac{\tau}{\phi})[\alpha_g G\sigma_b^2 - \alpha_b B\sigma_{bg}] \tag{III.22}$$

$$x^*_{ab} = \frac{N_b}{I} + (\frac{I_n}{I})(\frac{\tau}{\phi})[\alpha_b B\sigma_g^2 - \alpha_g G\sigma_{bg}] \tag{III.23}$$

$$x^*_{ag} = \frac{N_g}{I} + (\frac{I_n}{I})(\frac{\tau}{\phi})[\alpha_g G\sigma_b^2 - \alpha_b B\sigma_{bg}] \tag{III.24}$$

where

$$I_n = I - I_a$$

In the absence of social expenditure considerations, given their identical preferences and beliefs, altruistic and neutral investors would hold $\frac{N_b}{I}$ and $\frac{N_g}{I}$ shares of bad and good firms, respectively. However, because altruistic investors value corporate social expenditures, the two types of investors hold different amounts of each firms' shares.

The difference in holdings from $\frac{N_b}{I}$ and $\frac{N_g}{I}$ depends upon the marginal utility of social expenditures versus risk. Suppose, for example, that $\frac{\alpha_g G}{\sigma_{bg}} < \frac{\alpha_b B}{\sigma_b^2}$ (see equation III.24): the reward-to-risk of g holdings for the altruistic investor is less than the reward-to-risk of b holdings. In this case, $x^*_{ag} < \frac{N_g}{I}$. Then, from equation III.22, neutral investors will hold more than $\frac{N_g}{I}$.

The altruistic investor must also choose her charitable donation, D_I. Equation III.12 shows that the optimal personal contributions are the maximum of zero or

$$D^*_I = \frac{\alpha_i u_i + \beta I_a - \eta I_a(N_b D_b + N_g D_g) - (1 - t_i)}{\alpha_i v + \eta I_a^2} \tag{III.25}$$

Finally, the firms choose K_j and D_j to maximize $P_j + t_c[\Delta_j D_j + (1-\Delta_j)\bar{D}_j] - K_j$. The resulting first-order conditions for K_j^* and D_j^*, respectively, are:

$$k_1 - k_2(K_j^* - D_j^*) - 1 = 0 \tag{III.26}$$

and

$$-k_1 + k_2(K_j^* - D_j^*) + \frac{I_a}{I}\alpha_j(u_j - vD_j^*) + t_c\Delta_j = 0. \tag{III.27}$$

The first two terms in the D_j^* first order condition are equal to -1 by the first-order condition for K_j^*. The third term is $\frac{\delta P_j}{\delta D_j}$, which represents the marginal utility of a dollar of social expenditure by firm j. The last term is the tax rebate generated by firm j with a dollar social expenditure. Since $t_c < 1$ and Δ_j is zero or one, the first order condition for D_j at $D_j = 0$ shows that a small I_a could lead to an optimal negative D_j, which is not allowed. Thus, for some range of I_a, $D_j^* = 0$:

$$D_j^* = \text{Max}\{0, (\frac{1}{v})[u_j - (\frac{I}{I_a})\frac{1-t_c\Delta_j}{\alpha_j}]\} \tag{III.28}$$

We define the critical I_a values where each D_j^* switches from zero to positive: $\hat{I}_{ab}$ and $\hat{I}_{ag}$, where $D_b^* = 0$ for $I_a < \hat{I}_{ab}$ and $D_g^* = 0$ for $I_a < \hat{I}_{ag}$.

For exposition, we compute a numerical example of the equilibrium for various levels of I_a. The input parameters are:

$k_1 = 6$	$\tau = 200$	$\alpha_i = 0.1$
$k_2 = 1$	$u_i = 2$	$\alpha_b = 0.6$
$\sigma_b = 20$	$u_b = 4$	$\alpha_g = 0.6$
$\sigma_g = 20$	$u_g = 3$	$\beta = 6$
$\sigma_{bg} = 200$	$v = 2.5$	$\eta = .5$
$N_b = 0.5$	$w_b = 4$	$I = 1.0$
$N_g = 0.5$	$w_g = 2$	$l_j = .05\ j = b, g$
$t_c = 0.4$	$t_I = 0.3$	

Equilibrium values for various levels of I_a are shown in Table III.1.

Ia	Pb	Pg	Xng	Xnb	Xag	Xab	Db	Dg	Dl	Ia*Dl	Nb*Db	Ng*Dg	T	C	SS
0.00	16.00	16.00	0.50	0.50	0.50	-0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	15.88	15.94	0.50	0.56	0.50	-0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.10	15.76	15.88	0.50	0.62	0.50	-0.58	0.00	0.00	0.39	0.04	0.00	0.00	0.04	0.01	0.03
0.15	15.64	15.82	0.50	0.68	0.50	-0.52	0.00	0.00	1.53	0.23	0.00	0.00	0.23	0.07	0.16
0.20	15.52	15.76	0.50	0.74	0.50	-0.46	0.00	0.00	2.59	0.52	0.00	0.00	0.52	0.16	0.36
0.25	15.40	15.70	0.50	0.80	0.50	-0.40	0.00	0.00	3.56	0.89	0.00	0.00	0.89	0.27	0.62
0.30	15.46	15.64	0.56	0.74	0.36	-0.07	0.27	0.00	4.34	1.30	0.13	0.00	1.44	0.44	0.99
0.35	15.49	15.62	0.59	0.71	0.34	0.11	0.46	0.06	5.00	1.75	0.23	0.03	2.01	0.63	1.38
0.40	15.51	15.65	0.57	0.71	0.40	0.18	0.60	0.20	5.52	2.21	0.30	0.10	2.61	0.82	1.78
0.45	15.52	15.68	0.55	0.71	0.44	0.24	0.71	0.31	5.94	2.67	0.36	0.16	3.18	1.01	2.18
0.50	15.52	15.70	0.54	0.72	0.46	0.28	0.80	0.40	6.27	3.13	0.40	0.20	3.73	1.18	2.55
0.55	15.52	15.72	0.53	0.73	0.48	0.31	0.87	0.47	6.52	3.58	0.44	0.24	4.26	1.34	2.91
0.60	15.48	15.73	0.51	0.76	0.50	0.33	0.88	0.53	6.72	4.03	0.44	0.27	4.73	1.49	3.24
0.65	15.43	15.74	0.49	0.79	0.51	0.34	0.88	0.58	6.86	4.46	0.44	0.29	5.19	1.63	3.56
0.70	15.39	15.74	0.47	0.82	0.51	0.36	0.88	0.63	6.94	4.86	0.44	0.31	5.61	1.76	3.85
0.75	15.34	15.75	0.45	0.85	0.52	0.38	0.88	0.67	6.99	5.24	0.44	0.33	6.01	1.88	4.13
0.80	15.30	15.75	0.43	0.88	0.52	0.40	0.88	0.70	6.99	5.59	0.44	0.35	6.38	1.99	4.39
0.85	15.26	15.76	0.41	0.91	0.52	0.43	0.88	0.73	6.97	5.92	0.44	0.36	6.72	2.10	4.63
0.90	15.21	15.76	0.40	0.94	0.51	0.45	0.88	0.76	6.92	6.23	0.44	0.38	7.04	2.19	4.85
0.95	15.19	15.76	0.39	0.96	0.51	0.48	0.90	0.78	6.85	6.50	0.45	0.39	7.34	2.28	5.06
1.00	15.19	15.76	0.39	0.96	0.50	0.50	0.93	0.80	6.76	6.76	0.47	0.40	7.62	2.36	5.26

Table III.1: Equilibrium values for various levels of I_a/I

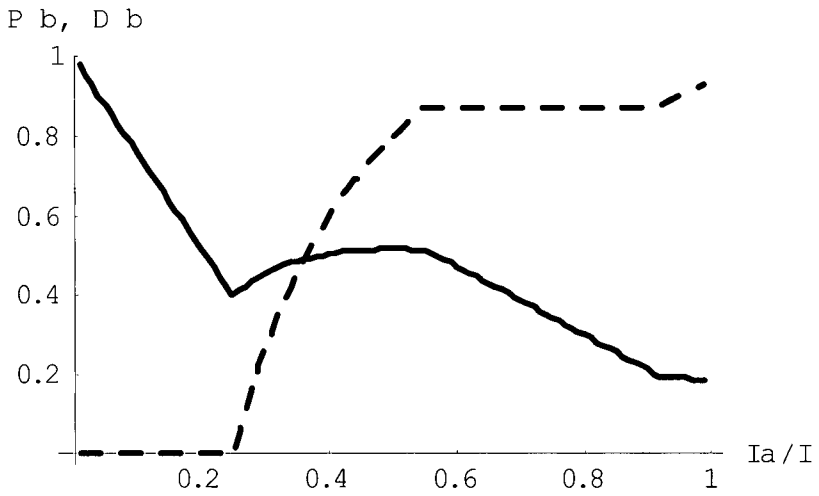

Figure III.1: Bad firms' share price and donations as a function of Ia / I (price – solid line, donations – dashed line)

3.4 The Impact of the Proportion of Altruistic Investors

Several results of interest relate to changes in the level of I_a.

Result P1: $K_j^* - D_j^*$, $j \in \{b, g\}$ are independent of the number of altruistic investors. This follows from equation III.26, the first order condition for K_j. The investment decision is not influenced by the presence of altruistic investors.

Result P2: $\hat{I}_{ab}/I = .28$ and $\hat{I}_{ag}/I = .33$, after which (for larger I_a) D_b^* and D_g^* are increasing with I_a. As seen in equation III.27, when $I_a = 0$, a dollar of CSR only generates a tax shield of $t_c\Delta_j < 1$, making such expenditures unprofitable. However, when $I_a > \hat{I}_{aj}$, the combination of the impact on price in addition to the tax shield is great enough to make the social expenditure profitable.

Result P3: At very high levels of I_a, it is possible that firms will make CSR expenditures even past the amount that generates a tax rebate. In the numerical example in Table III.1, D_b exceeds that amount ($\bar{D}_b = .875$) if I_a is above .95. Past this point, the preponderance of altruistic investors means that the price

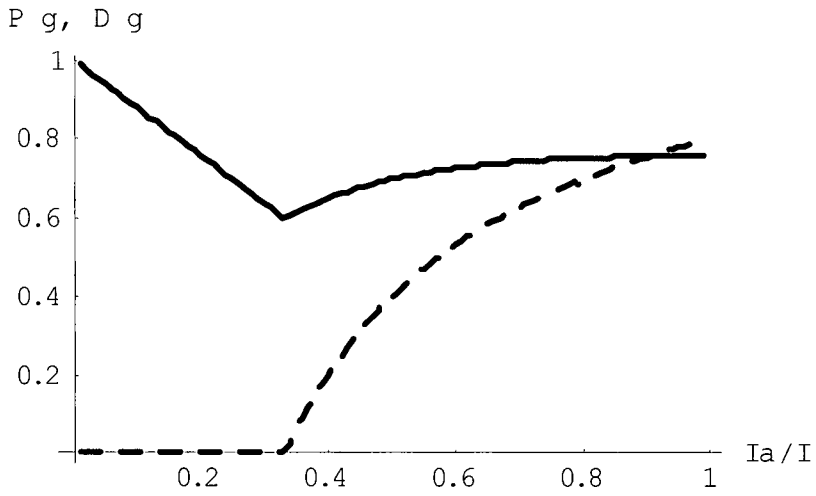

Figure III.2: Good firms' share price and donations as a function of Ia / I (price – solid line, donations – dashed line)

impact of CSR expenditures is so great that no additional tax rebate incentive is required.

Result P4: Stock prices, P_b and P_g, are non-monotonic in the fraction of altruistic investors. This is seen in Figures III.1 and III.2. For example, as I_a increases from 0 to 1, P_b first decreases, until D_b goes positive and starts increasing in I_a. P_b then increases until D_g becomes positive. The increasing attractiveness of g firms causes P_b to then decrease over the remainder of the I_a range.

The nonlinearity of P_j in I_a follows from Equation III.28, which shows that D_j is nonlinear in I_a, and the definition of B and G, which have B and G nonlinearly related to D_b and D_g and finally that B and G enter P_b and P_g in equations III.19 and III.20.

The expected returns to the firms, $E(r_j) = (\mu_j/P_j) - 1$, differ whenever the stock prices differ since both firms have the same production technology and so set the same expected end-of-period cash flows, $\mu_b = \mu_g$. The pattern of expected returns as I_a changes is, therefore, just the inverse of the stock price

patterns described above.

Result P5: a and n investors obtain different portfolio expected returns[3] as I_a varies from 0 to 1. Using the optimal portfolio weights shown in Table III.1 multiplied by the firms' expected returns shows that, at all I_a levels, neutral investors earn a higher expected portfolio return than do altruistic investors. By caring about CSR, optimal portfolios of altruistic investors shift risk to neutral investors, who demand a higher expected return for bearing this risk.

Result P6: When there are few altruistic investors, their best tool for gaining utility is to short the bad firms. In our example, for small I_a, $\frac{\alpha_b B}{\sigma_{bg}} - \frac{\alpha_g G}{\sigma_g^2} < 0$ which implies that, for small I_a, $x_{ab} < 0$ and $x_{nb} > \frac{N_b}{I}$. In this example, altruistic investors short b shares as long as $I_a < .33$.

Shorting bad firms by altruistic investors makes them happier than not shorting, but it does not encourage CSR expenditures by the corporations until there are enough altruistic investors that depress the bad technology stock price (P_b is decreasing in I_a from $I_a = 0$ to about $I_a = .25$). The bad technology firms react to the low stock price by commencing social expenditures (b begins first).

Result P7: The donation per individual altruistic investor, D_I^*, is non-monotonic in I_a, reaching a maximum at about $I_a = .80$. As the number of altruistic investors increases, each such investor optimally reduces her individual donation. It is also the case that total personal donations, $I_a D_I^*$, is monotonically increasing in I_a.

Result P8: Total CSR expenditures and donations, $T = I_a D_I^* + N_b D_b^* + N_g D_g^*$, is monotonically increasing in I_a. Altruistic investors contribute on their own, but they also induce firms to make social expenditures by affecting stock prices.

Result P9: As I_a changes from 0 to 1, both total personal donations, $I_a D_I^*$, and corporate social expenditures, $N_b D_b^* + N_g D_g^*$, increase. In fact, in the numerical example, as I_a increases from .20 to .30 in ten equal increments of .01, the

[3]We assume that $r_f = 0$, so the returns we refer to here are excess returns over r_f.

correlation of total personal donations with total corporate social expenditures is .91.

This result has an interesting interpretation. If we assume that our one-period model applies over time, with I_a increasing in a way that is totally unanticipated by entrepreneurs and investors, then we would see both total personal donations and corporate social expenditures moving up in a highly correlated way. Thus, it would appear, over time, that personal donations and corporate social expenditures are *complements*, not substitutes[4].

As a simple test of this implication, we gathered data on total individual and corporate charitable giving from a publication titled Giving USA: the Annual Report on Philanthropy[5]. We divided total personal donations per year by annual GDP and also divided total corporate donations by GDP. The correlations between these donations is -.01 from 1954 to 2001, .147 from 1981 to 2001 and .298 from 1991 to 2001.

These correlations are substantially less than our model's estimate of around .9. This could be due to many factors. It is highly likely that more is changing over time than just I_a. Investors' utility for CSR spending may be changing in ways that are not related to wealth (GDP). In addition, our measure of corporate CSR spending is restricted only to charitable giving; we cannot measure how much of their capital budget is devoted to CSR-like expenditures that are not classified as donations. The correlation did grow as the observation period was shortened to just the last ten years. Perhaps only in this period are many investors recognizing their utility for CSR spending.

Result P10: Assume that $I_a = .40$. At this level of altruistic investors, both b and g firms are donating, but below the maximum allowable for tax deduction

[4]This occurs despite the fact that the altruistic investor's iso-utility curves are downward sloping in (D_j, D_I) space: the presence of total donations, T, in the utility function gives this aspect of substitutability between D_j and D_I.

[5]See the bibliography.

purposes. This appears to be the case empirically. Evidence from the publication Giving USA: the Annual Report on Philanthropy, lists tax-deductible donations as a fraction of net income before taxes, by industry, for 1998. Most industries were well below the maximum of 10%: Finance and Insurance gave .4%; Manufacturing gave 1.4% and Information gave 2.1%. The largest donating industries were Agriculture (8.3%) and Mining (8.1%).

This evidence also suggests that b firms spend more on CSR than do g firms. Mining would be considered much more of a b industry and information technology much more of a g firm.

The big social contributors are individuals. With $I_a D_I = 2.206$ and $N_b D_b + N_g D_g = .400$, the ratio of personal donations to corporate CSR is 5.5 times. If we take recent levels of personal donations relative to business donations (source: Giving USA: the Annual Report of Philanthropy) this ratio is about 15 times. However, we believe that the reported corporate contributions underestimate the amount of CSR spending because some amount of CSR is not actual donations but capital expenditures or normal business expenses.

Result P11: Firm entrepreneurs' payoffs, $P_j + t_c[\Delta_j D_j + (1 - \Delta_j)\bar{D}_j] - K_j$ are decreasing over the range of I_a from 0 to 1. This payoff can be rewritten as $P_j + t_c(1-\Delta_j)\bar{D}_j - (1-t_c\Delta_j)D_j - (K_j - D_j)$ and the last term is constant. Then, this payoff declines as I_a increases because the increasing optimal expenditures, D_j, are greater than the increases in P_j, when P_j increases. For example, in Table III.1, when P_b rises over the range $I_a \in [.25, .50]$ (where $\Delta_j = 1$), $(1-t_c)D_b$ rises faster, driving down the firm's total payoff.

3.5 The Impact of Tax Policy Parameters

For a given proportion of altruistic investors, I_a, tax policy, in the form of parameters t_I, t_c and $l_j = \frac{\bar{D}_j}{\mu_j}$, will impact the level of total donations, $T =$

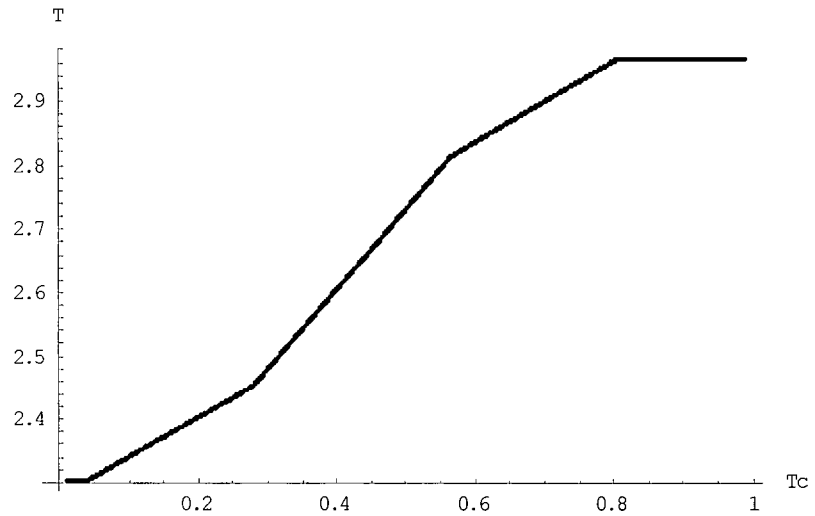

Figure III.3: Total donations as a function of corporate tax rate (Ia / I = 0.4)

$I_a D_I^* + N_b D_b^* + N_g D_g^*$, as well as the cost of lost tax revenues, $C = I_a t_i D_I^* + N_b t_c[\Delta_b D_b^* + (1 - \Delta_b)\bar{D}_b] + N_g t_c[\Delta_g D_g^* + (1 - \Delta_g)\bar{D}_g]$. We define $T - C$ as the *social surplus* of total donations and CSR expenditures less the tax cost of inducing this activity: $SS = T - C$.

Result T1: Social surplus is monotonically decreasing in t_I, the tax break given for personal donations. An additional dollar of tax break to individuals does not generate an additional dollar of total CSR and personal donations. This is because corporate donations (see equation III.28) are independent of the tax break given to individuals. Thus, while individuals give more as t_I increases, corporations don't, and marginal total donations are less than the marginal tax breaks given. In our model, allowing individuals to deduct donations does not appear to be an efficient policy.

Result T2: Social surplus is non-monotonic and concave in the corporate tax break, t_c. Figures III.3 through III.5 plot, as a function of the rebate rate on corporate CSR, t_c, total individual donations plus corporate CSR expenditures, T, and lost tax revenue, C, and the difference, termed social surplus, SS, for the

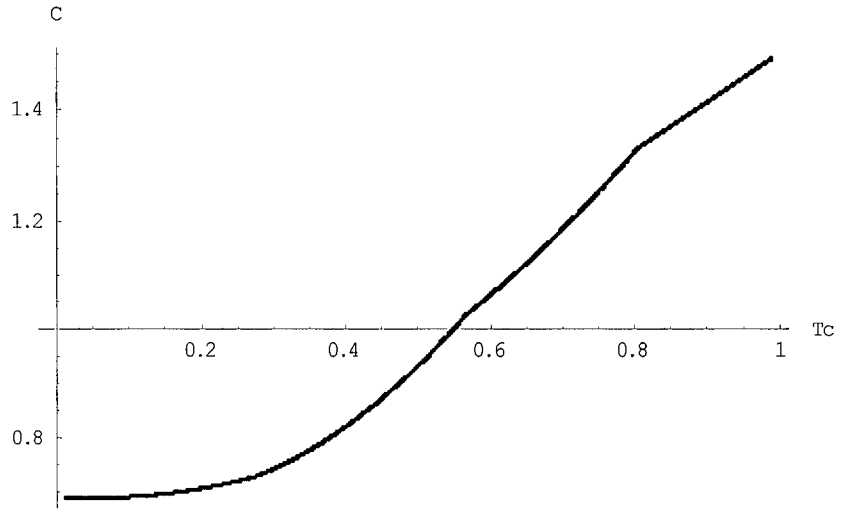

Figure III.4: The cost of lost tax revenues as a function of corporate tax rate (Ia / I = 0.4)

case when $I_a = .40$. Other levels of I_a offer qualitatively similar results. There are five segments to the plots.

In the first segment ($t_c < .05$), neither b nor g firms make CSR expenditures. And, individual donations, D_I^*, are independent of t_c. Thus, T is limited to (constant) individual donations, C is a constant, and so is SS.

In the second segment ($.06 < t_c < .28$) D_b^* becomes non-zero and increases with t_c. Because CSR spending is rising, so is C, but at a slower rate, so SS is increasing in this tax region. In this segment the tax break is not enough to induce g firms to make CSR expenditures.

In the third segment ($.29 < t_c < .56$), both firm types increase their CSR spending as t_c rises, so total donations are rising faster than the tax break making social surplus increase. Total donations rise even though individual donations, $I_a D_I^*$, are dropping. Equation III.25 shows that D_I^* is decreasing in total corporate CSR spending.

It is in this segment that social surplus reaches its maximum. The maximum is reached because the tax rebate gets so large that it offsets the increases in

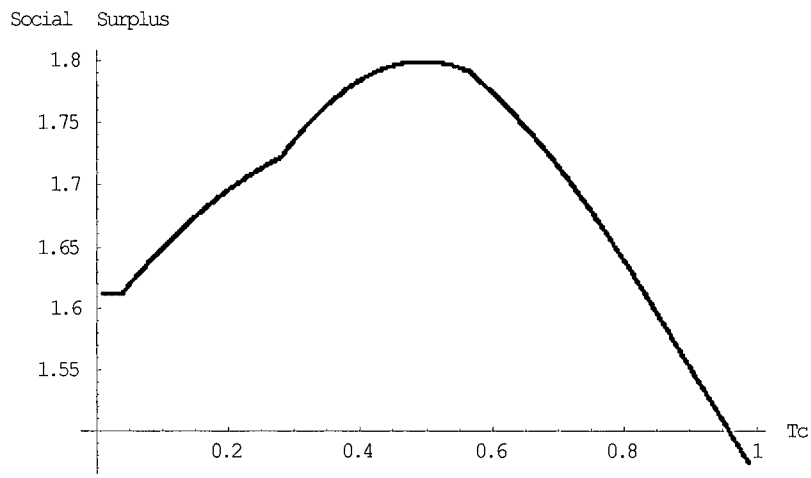

Figure III.5: Social Surplus (T-C) as a function of corporate tax rate (Ia / I = 0.4)

corporate CSR spending generated by the higher rebate rate.

In the fourth segment ($.56 < t_c < .80$), b firms have reached the maximum donation that qualifies for a tax rebate (5% of expected cash flow, μ) and, without the tax incentive, they hold the CSR at $D_b = \bar{D}_b$. D_g continues upwards with t_c, but the increase in CSR spending is less than the tax cost increase so SS is falling over this segment.

Finally, above $t_c = .81$, both firm types have used up all the tax-allowed CSR, so they do not donate more as t_c rises, but the rebates do rise, meaning C increases and SS falls.

At many levels of I_a, we can find an interior optimum to the social surplus, as a function of t_c, given the tax limits, l_j.

Result T3: The optimal rebate rate, t_c, that maximizes social surplus, varies with the upper limit on tax-deductible CSR expenditures, l_j. For example, at $I_a = .40$:

A limit of:	optimal tax rebate rate of	for a social surplus of:
.025	.42	1.750

.050	.49	1.799
.075	.49	1.799

This can be seen in Figure III.6. As we move from left to right (increasing l_j), the rebate rate, t_c, that maximizes social surplus increases until the maximum social surplus continues to occur at $t_c = .49$ and remains constant at 1.799.

A tight upper limit on the amount of CSR that generates a tax rebate, $l_j = .025$, leads to a lower optimal tax rebate rate, t_c and a lower (maximum) social surplus, 1.750, than if the limit is $l_j = .05$.

However, loosening the upper limit beyond some point does not change the optimal rebate rate. From above, the optimal t_c remains at .49 at a limit of $l_j = .075$ (or higher). So, as l_j increases beyond about $l_j = .05$, total donations and tax revenue lost remain constant, meaning that social surplus is also constant.

This result has policy implications. Whatever the reason for limiting the tax rebate on CSR spending (e.g., agency concerns), the tax rebate rate that maximizes social surplus is a function of the chosen l_j, only if l_j is below some point (about $l_j = .05$ in our numerical example). If l_j is above this point, the optimal t_c is the same for any l_j.

This optimal (l_j, t_c) relationship only holds for intermediate values of I_a. At low values of I_a (0 to .30 in our example), $D_b = D_g = 0$ and so the tax rebate and limit policy variables have no impact on corporate CSR spending, and individual donations are independent of these policy variables, so social surplus is unaffected by the policy variables.

At high values of I_a, the optimal tax rebate rate for any limit is $t_c = 0$. In these cases, the market power of altruistic investors is so great that no tax incentive is necessary to generate social surplus.

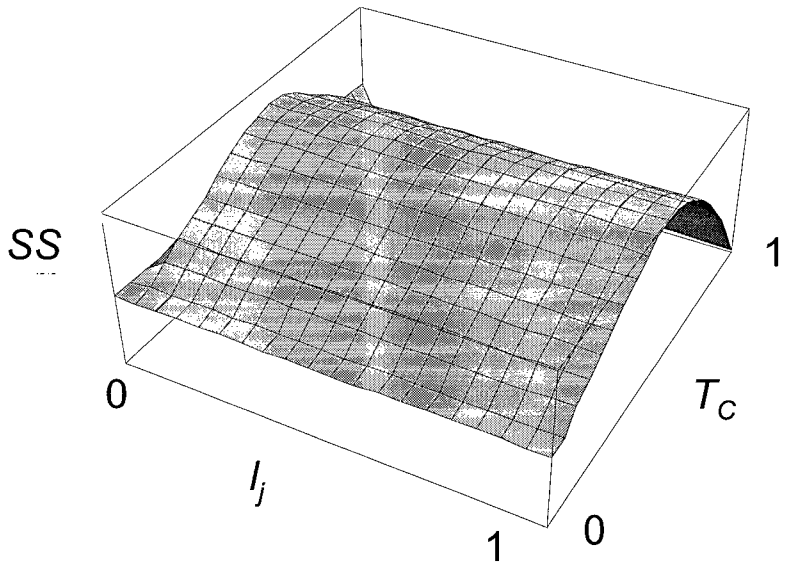

Figure III.6: Social Surplus as a function of corporate tax rate and donations' ceiling (Ia / I = 0.4)

3.6 Conclusion

This chapter assumes that CSR spending is not just a way of increasing revenues or decreasing costs. In fact, one could argue that such expenditures should not even be called CSR spending.

We define CSR spending as having utility for some investors. By assuming that some investors gain utility from owning firms that practice CSR, we show how this concern impacts investors' risk-sharing opportunities, equilibrium prices and so, value-maximizing firms' decisions about practicing CSR.

We choose a set of parameter values, shown in Table III.1, with $I_a = .40$, that provides an equilibrium with empirically reasonable implications, including:

- Both types of investors hold both types of firms. Altruistic investors hold the stock of firms with poor CSR fundamentals, but less than is optimal from a pure risk-sharing viewpoint. This requires neutral investors to hold more of the firms with poor CSR fundamentals than they would prefer for risk-sharing, leading to poor-CSR firms' stock price being less than good-CSR firms. Since both firms make the same optimal investment, the P/E ratio for the poor-CSR firms is lower than the P/E ratio for the (risk-equivalent) good-CSR firms.
- This investor behavior induces firms with poor CSR fundamentals to improve their CSR record ($D_b > 0$). Firms with better CSR fundamentals also spend on CSR ($D_g > 0$), but they spend less than the firms with poor CSR fundamentals.
- Investors also make individual donations which, in aggregate, are several times the size of corporate social spending.
- If, over time, I_a/I, the fraction of investors that value CSR spending, increases in a way that is unanticipated by investors, both individual donations, $I_a D_I$, and corporate CSR spending, $N_b D_b + N_g D_g$, will increase with

a very high correlation, making them appear as complements, despite the aspect of substitutability built into the assumed utility function of altruistic investors.

We also find that policy variables, t_I, t_c and l_j, influence the social surplus in important ways. First, for many parameter values, social surplus is monotonically decreasing in the tax rebate given to individual donations, t_I. Because changing the individual tax rebate rate does not influence corporate CSR spending, raising the rebate rate generates less new individual donations than the additional tax rebates given, causing social surplus to be lower.

Second, social surplus is non-monotonic in the corporate tax rebate. That is, there is a social-surplus-maximizing level for the corporate tax rebate rate, for any given set of parameters.

One of the important parameters is l_j, the limit on net income that can be used for CSR spending *and* qualify for a tax rebate. Any CSR spending beyond l_j generates no additional tax rebate. We take the rebate limit as given. This limit may exist as a political compromise between groups favoring CSR tax rebates and those that feel such spending is outside the area of corporate responsibility. Or some may view CSR spending as an agency problem, benefitting management at the expense of shareholders.

Whatever the reason for the tax rebate limit, its level influences the social surplus-maximizing level for the corporate tax rebate rate. Raising the tax rebate limit leads to higher optimal tax rebate rates, up to a maximum, past which the optimal tax rebate rate is constant.

As corporate social responsibility rises in prominence, it's impact on capital market equilibrium and optimal CSR behavior will increase. This chapter begins to explore that equilibrium.

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CHAPTER IV
CORPORATE SOCIAL RESPONSIBILITY AS A CONFLICT BETWEEN SHAREHOLDERS

One of the most significant corporate trends of the last decade is the growth of Corporate Social Responsibility (CSR). Definitions of CSR vary but generally refer to serving people, communities and the environment in a way that goes above and beyond what is legally required of a firm. The alignment of business operations with social values is by now an industry in itself, with full-time staff in corporations, hundreds of websites, newsletters, professional associations and consultants. Most major companies have a special annual publication dedicated to CSR; others devote a big section of their annual report to the documentation of social goals advanced and good works undertaken.

In this chapter we wish to gain a better understanding for this dramatic increase in CSR expenditure. We argue that the relation between CSR expenditure and firm value has to be non-monotonic. When CSR expenditure is low, it has a positive contribution to firm value, for example by increasing productivity of employees or avoiding costs such as bad reputation and pollution fines. But at some point, the marginal effect of an additional dollar of CSR expenditure decreases shareholders wealth as there is no limit to the amount that a firm can donate to society. If firms decision-making were done solely by value maximizing individuals then the chosen level of CSR expenditure would have been consistent with that objective (e.g., Demsetz and Lehn (1985)). However, we claim that insiders (corporate managers and large blockholders) who are affiliated with the firm may have an interest to increase CSR expenditure to a higher level than that which maximizes firm value. They may do so because they gain unique benefits from a high CSR rating. A good social rating enhances their reputation as being decent individuals who respect their employees, communities and the environment and care about society. While insiders may benefit from CSR, other

shareholders may not approve of a high CSR expenditure if it reduces firm value. Therefore, CSR may be the source of a conflict between different shareholders.

In order to test this potential conflict we analyze the relation between CSR and the ownership and capital structure of firms. If insiders gain unique benefits at the expense of other shareholders, their degree of ownership should matter in setting the amount of CSR expenditure in the firm. The level of ownership by insiders can have two potential effects.

On the one hand, as argued by Demsetz (1983) and Fama and Jensen (1983), with high ownership comes entrenchment, which allows insiders to pursue a pro-CSR agenda more easily. Morck, Shleifer, and Vishny (1988) argue that entrenchment is reached at relatively low levels of ownership (between 5% to 25%). But on the other hand, when insiders' ownership is high, insiders bear more of the cost of the CSR expenditure. Thus, given that insiders are entrenched, their ownership should only be associated with better alignment with other shareholders. In other words, if CSR expenditure is at a level in which it reduces firm value then, *ceteris paribus*, insiders' ownership should be negatively related to the level of CSR expenditure since insiders bear more of the cost associated with this expenditure as their degree of ownership rises.

If a CSR conflict indeed exists, insiders gain at the expense of other shareholders. These include institutional and small individual investors. While small individual shareholders do not have an impact on the decision-making process in the firm, there is some evidence that institutions play a role in mitigating agency conflicts (e.g., Hartzell and Starks (2003) and Bhojraj and Sengupta (2003)). Therefore, institutional ownership is one of the variables that we incorporate in the analysis.

The capital structure of the firm may also influence the CSR conflict. When firms have high interest payments, it limits the ability of insiders to over-invest in CSR. This is similar to arguments suggested by Jensen (1986) and Zweibel (1996).

High debt levels also induces creditors to play a more active monitoring role (e.g., Diamond (1991), Gilson (1990)), which may help to mitigate the conflict.

We employ a unique and large data set that categorizes firms in the Russell 3000 index to being either socially responsible (SR) or socially irresponsible (SI). Controlling for industry and firm characteristics, we show that insiders' ownership is negatively and significantly correlated with CSR ratings. An increase of one standard deviation in total insiders' ownership of a firm decreases by 3.8% the probability that it will be classified as SR. The result supports our hypothesis that insiders gain personal benefits from CSR. Assuming that there is a positive monotonic relation between the level of CSR expenditure of the firm and the probability that the firm receives an SR rating, the negative correlation upholds the claim that insiders reduce CSR expenditure depending on their degree of ownership. At high levels of ownership they bear more of the cost involved in CSR and are more aligned with firm value maximization. The fact that they choose to reduce CSR expenditure shows that the marginal dollar spent on CSR reduces firm value.

In addition we find that an increase of one standard deviation in the leverage of a firm decreases the probability that it will be defined as SR by 2.2%. This result also supports the CSR conflict hypothesis since higher debt levels reduce the ability of insiders to over-invest in CSR. In contrast, we find that institutional ownership is not correlated with the social ratings. This provides supportive evidence to the claim made by Woidtke (2002) that public institutions may care about social issues more than about maximizing the value of their portfolio. The results are persistent throughout the study for different specifications and robustness checks. To rule out possible endogeneity problems we use an instrumental variable (IV) approach.

One of the contributions of the chapter is the development of a relative CSR measure (RCSR). The need for such a measure comes from the fact that our

raw data consist of a binary CSR rating that does not distinguish between firms within each of the two groups (i.e., SI and SR). Our methodology maps the binary CSR measure into a continuous one by taking into account firm characteristics such as industry, size, age and growth opportunities. The results are robust to this alternative approach.

The CSR conflict is somewhat different than typical agency conflicts since all insiders (and not only managers) may gain personal benefits from a high CSR rating. However, it is very common to link CSR with corporate governance. Arguably, this link is due to the perception that a high CSR expenditure and good corporate governance mechanisms are both to be found in so called ethical firms. We therefore examine whether the CSR conflict is related to the presence of standard corporate governance mechanisms. We use the governance index suggested by Gompers, Ishii and Metrick (2003) (GIM) to learn about this possible relation and find that the CSR ratings and the GIM index are uncorrelated.

Despite the enormous interest in CSR, the literature has so far concentrated on the relation between CSR and financial performance (see Griffin and Mahon (1997) for a survey). We focus on the decision-making process in the firm by looking at firms' ownership and capital structure. To the best of our knowledge, the only paper that bears some similarities to ours is Navarro (1988) who studies the nature of corporate giving to charity. However, his focus is on tax policies with respect to corporate donations.

The remainder of the chapter proceeds as follows. In Section 4.1 we present the CSR-conflict hypothesis and the different mechanisms that can potentially affect it. In Section 4.2 we describe the data and the variables that we use in the empirical analysis. In Section 4.3 we conduct the empirical analysis. Section 4.4 investigates the relation between CSR and the GIM index. Section 4.5 concludes.

4.1 CSR as a Conflict between Different Shareholders

The conflict that we analyze can be regarded as a conflict between two types of shareholders: insiders, who are affiliated with the firm, and other shareholders such as institutions or small individual investors, who are not affiliated with the firm. Affiliated owners are those investors whose either reputation, identity or heritage is related to the firm, while non-affiliated owners are the majority of investors who hold shares in the firm as part of a well diversified portfolio and have a relation with the firm that does not go beyond its affect on their portfolio value. Our hypothesis is that insiders, the affiliated shareholders, may gain private benefits from being identified with a firm that has a high CSR rating, or stated similarly, insiders bear a cost from being associated with a firm which is classified as socially irresponsible.

The group of insiders is composed of three subgroups: managers, blockholders who are not part of the daily management team, and directors who are not part of the first two groups (i.e., hold less than 5% of the firm's equity and not part of the daily management team). It is hard to hypothesize which group would gain more from being associated with a socially responsible firm. However, we argue that all three subgroups care about the firm's social rating more than a diversified shareholder. For example, consider the following three individuals: Steven Jobs, the CEO of Apple Computer, Warren Buffet a large blockholder of The Coca-Cola Company and Roy Disney, a director of The Walt Disney Company. All three individuals are strongly affiliated with their corresponding firm. Our claim is that these individuals gain from the fact that these firms have a high CSR rating more than a diversified shareholder such as Fidelity, whose image is not affected by the social rating of one specific firm.

In what follows, we explore how this potential CSR conflict may be affected by different attributes of the firm; the most important being the ownership and

capital structure. In addition, we discuss how free cash flow and the composition of the board of directors may affect the conflict.

Insiders As argued above, insiders are typically affiliated with the firm and may benefit from the fact that a firm is classified as SR. On the other hand, if CSR expenditure is at a level in which it reduces firm value the degree of ownership of insiders should matter. Jensen and Meckling (1976) claim that deviation from value-maximization declines as management ownership rises. Others argue that with more control comes also more entrenchment (Demsetz (1983), Fama and Jensen (1983)), which may result in management engaging in non-value-maximizing activities. Whereas the alignment hypothesis predicts that larger stakes by insiders may reduce the CSR-conflict, the prediction of the entrenchment hypothesis is less clear-cut. For example, Morck, Shleifer and Vishny (1988) claim that entrenchment is reached at levels of ownership below 25% and that an increase in ownership above that level does not result in more entrenchment but further increases alignment with shareholders.

Institutions Shleifer and Vishny (1986) argue that institutional shareholders, by virtue of their large stockholding, have incentives to monitor corporate decision-making. Consistent with this hypothesis, a few studies document institutional investors' voting against harmful amendments (Jarrell and Poulsen (1988), Brickly, Lease, and Smith (1988)). Other papers show that institutional investors enhance firm value as measured by Tobin's Q (McConnell and Servaes (1990, 1995)), increase pay for performance for executives (Hartzell and Starks (2003)) and reduce agency costs between shareholders and bondholders (Bhojraj and Sengupta (2003)).

On the other hand, Black (1992) points out that institutional investors are agents whose objective may differ than that of their unit holders. Woidtke (2002) finds supporting evidence for this claim by showing that public pension funds do

not enhance firm value. She argues that these funds are often managed by officials that have their own personal agendas, such as campaigning for public office. Under such circumstances, these institutions may find that a pro-CSR agenda coincides with their private objectives even if it reduces firm value. Moreover, it is conceivable that even for private funds a higher priority would be given for voting against golden parachutes compared to voting against donations to the tsunami victims, for example.

When discussing the impact that institutions may have on CSR, some attention should also be given to Socially Responsible Investing (SRI), which refers to making investment decisions that consider also social criteria. A typical SRI fund would avoid holding shares of firms that have a poor CSR rating. According to the Social Investing Forum, an association dedicated to promoting SRI, the amount of funds involved in SRI reached a level of US$ 2.2 trillion as of December 2003, accounting for about 11 percent of all managed funds in the US.[1] However, only 20 percent of this amount is invested in portfolios controlled by institutions who also advocate on various social and environmental issues within the firms. This suggests that while SRI may lead to high ownership of institutions in socially responsible firms, the direct impact of these institutions on the CSR policy of these firms is currently limited.

Leverage Over-investment is easier when firms have a lot of cash in place (e.g., Jensen (1986) and Zweibel (1996)). Therefore, debt servicing obligations may help to discourage possible over-investment in CSR by self serving insiders. Moreover, banks and debt holders can also be active investors. They have investments in the firm, and want to see the returns on these investments materialize. While they do not have voting rights, they have other means to monitor the firm's policy. Firms occasionally have to raise additional capital from creditors which

[1] 2003 Report on Socially Responsible Investing Trends in the United States, Social Investment Forum.

results in their ability to influence decisions. Gilson (1990) documents that U.S. banks play a major governance role by replacing managers and directors. Creditors, compared to shareholders, typically keep their debt holdings for a longer period. This has some advantages, such as the ability to influence corporate management by patient, informed investors.

Free Cash Flow Jensen (1986) suggests that it is easier for managers to consume perks in firms with substantial free cash flow as these managers do not have to raise more funds from questioning investors.[2] While Jensen's theoretical argument is solid, testing it empirically is very difficult since the level of free cash flow is unobservable. Consider, for example, one of the most commonly used measures of free cash flow, proposed by Lehn and Poulsen (1989):

$$FCF = INC - TAX - INTEXP - PFDDIV - COMDIV$$

where,

FCF = free cash flow

INC = operating income before depreciation

TAX = total taxes

$INTEXP$ = gross interest expenses on short and long-term debt

$PFDDIV$ = total dividend on preferred shares

$COMDIV$ = total dividend on ordinary shares

This free cash flow measure does not represent the *availability* of cash; rather, it represents the cash *left* in the company after perks were potentially consumed. In the context of this chapter, this free cash flow measure is a bad proxy for the CSR expenditure potential because CSR costs have already been incurred in the operating income. Hence, the observable measure is net of CSR.

[2] Jensen (1986) also argues that the likelihood of perk consumption by managers is especially high in mature firms operating in low growth industries.

Moreover, since any measure of free cash flow is a measure of net free cash flow (as oppose to the unobservable gross free cash flow), using it as an explanatory variable results in a severe endogeneity problem. For these reasons we do not use free cash flow in the analysis.

Board of Directors The corporate finance literature recognizes board composition as an additional mechanism that may affect standard agency conflicts. For example, Ryan and Wiggins (2004) claim that independent directors help in aligning managers' objectives with those of other shareholders. It is important to note, however, that the CSR-conflict is not between managers and other shareholders; rather, it is between affiliated and non-affiliated shareholders. We view both inside and outside directors as affiliated shareholders since their reputation may be affected by the firm's CSR rating. Therefore, if all board members had the same ownership level, we would not expect to find a correlation between CSR and board composition. We are aware of the fact that board composition is correlated with insiders' ownership; however, employing board composition in the analysis is not helpful since we use a direct measure of insiders' ownership.

4.2 Data

Data Source Our data are gathered from a variety of sources. The first is a unique database that we have obtained from Kinder, Lydenberg and Domini Research & Analytics, Inc. (KLD), the leading research group in providing ratings of corporate social performance to investors. The KLD database screens close to 3,000 firms and categorizes them to be either socially responsible (SR) or socially irresponsible (SI). To the best of our knowledge we are among the first to use this comprehensive database, which was launched in 2001.[3] Our sample includes firms

[3] Aggarwal and Nanda (2004) use similar data to study the impact of the size of a firm's board of directors on managerial incentives.

that account for 98% of the total market value of US public equities. Other data sources that we use are proxy statements, 13F schedules, CRSP, and Compustat. Our database is cross-sectional and it is composed of the most recent data as of the third quarter of 2003 (September 2003).[4] Table IV.1 provides a complete description of the main variables used in the study.

The CSR Measure KLD launched in 2001 the Broad Market Social Index (BMSI). The BMSI, a subset of close to 3,000 firms that compose the Russell 3000 index, is generated after a CSR screening process takes place. In this process, KLD divides firms to three different categories: SR, SI due to *exclusionary* reasons and SI due to *qualitative* reasons. Only SR firms are eligible for inclusion in the BMSI.

Sorting firms into these three categories involves a two-stage social screening process. First, KLD applies an exclusionary social screening. In this stage SI firms are defined as follows: companies that derive any revenues from alcohol, tobacco, or gambling; companies that derive more than 2% of gross revenues from the production of military weapons; and electric utilities that own interests in nuclear power plants or derive electricity from nuclear power plants in which they have an interest. It is important to note that the exclusionary screening that KLD applies is a per-se criterion. As long as Philip Morris, for example, continues to produce cigarettes, it is defined as SI. Thus, even if Philip Morris' expenditure on CSR is relatively high, it would never get an SR rating from KLD. Firms that fail in this screening stage can not be reconsidered to be SR unless they shut-down the "unethical" side of their business. In some cases, as in the case of Philip Morris, this means shutting-down the firm. Out of the 2,837 firms that were considered, 187 are defined as SI due to exclusionary reasons.

In the second stage, KLD applies a qualitative social screening on the re-

[4]Note that corporate social performance is a long term screening measure that does not vary over a short period of time.

	Description	Source
Conflict variables		
Insiders' ownership	Percent of common stock held by all the officers and directors of the company plus beneficial owners who own more than 5 percent of the subject company s stock as disclosed in the most recent proxy statement.	Proxy statement
Insiders' control	A dummy variable that equals 1 if insiders' ownership is greater than 50%.	Proxy statement
Institutional ownership	Percent of common stock held by all the reporting institutions as a group. It is calculated as total shares owned by institutions divided by total shares outstanding.	13F schedule
Institutional HHI	The Herfindahl-Hirschman Index (HHI) of concentration of the top 15 institutional owners (as reported on 13f). It is defined as $\sum_{i=1}^{15} h_i^2$, where h_i is the percentage ownership of institution i.	13F schedule
Leverage	The book value of long term debt (data item #9) divided by the book value of assets (data item #6)	Compustat
Control variables		
Ln (total assets)	Natural log of book value of total assets (data item #6)	Compustat
Market to book	The ratio of the market value of assets (book value of assets (data item #6) plus the difference between the market value of equity (data item #24 Ldata item #25) and the book value of equity (data item #60)) to the book value of assets (data item #6).	Compustat
Return volatility	The standard deviation of share returns during the previous 60 months.	CRSP
Firm's age	The year in which the firm's share price (data item PRC) first appeared on CRSP.	CRSP
2-digit SIC code	The 2-digit Standard Industry Classification code	CRSP
Other		
Turnover	The three months average of the monthly volume (data item VOL) divided by the number of shares outstanding (data item SHROUT)	CRSP

Table IV.1: Definition and source of major variables

maining firms. Qualitative screening includes areas such as community relations, workforce diversity, employee relations, environment, non-US operations, and product safety and use. In each of the areas, KLD investigates a range of sources to determine, for example, whether the company has paid fines or penalties in an area or has major strengths in the area (e.g., strong family policies for the employees' relations category). Where possible, KLD uses quantitative criteria to determine the rating (e.g., dollar amount paid in fines; percentage of employees receiving certain kinds of benefits). Some subjective judgment is necessary, of course, in the determination of the cutoff point for a negative rating, as well as in borderline cases. In our sample, 2,278 firms passed the qualitative social screening and are defined as SR firms, while 372 firms did not pass the qualitative screening and are defined as SI firms.

The dependent variable in most of our analysis is the CSR rating of each firm. Optimally, we would like to have a continuous measure of the CSR rating, but the data are not available. Our substitute is the binary variable, *CSR*, which equals one if a firm passes the screening conducted by KLD and zero if it fails. Our underlying assumption is that there is a monotonic relation between the CSR expenditure of the firm and the probability that the firm receives an SR rating from KLD. With respect to the qualitative screening we feel comfortable with this assumption since it is a comprehensive analysis that looks into many dimensions of social issues (more than 200 sections) and it is reasonable to assume that firms with higher CSR expenditure tend to receive an SR rating. On the other hand, SI firms due to exclusionary screening receive their rating due to a failure in one "unethical" dimension, which is controversial at best. These firms can not be employed in the analysis because they can not be considered as firms with low (nor high) CSR expenditure. Thus, we omit these firms from the sample and left with 2650 firms in the analysis.

Table IV.2 reports the number of SR and SI firms, sorted by 2-digit SIC codes

to sixty-four industries. The ratio of $\frac{SR}{SI}$ over the whole sample is approximately 6. There are, of course, large variations across industries. Some industries, such as the high-tech industry are dominated by SR firms, while other industries, such as basic materials, have a higher proportion of SI firms.

Conflict Variables As mentioned above, when considering the ownership structure we focus on two groups of investors: insiders and institutions. We use two measures for ownership by insiders. The first is *Insiders' ownership,* the percent of common stock held by all officers and directors of the company plus beneficial owners who own more than 5 percent of the subject company's stock as disclosed in the most recent proxy statement. Our second measure is *Insiders' control,* a dummy variable which equals one if the combined ownership of insiders is more than 50% of the shares outstanding, and zero otherwise. This allows us to isolate cases in which insiders (jointly) have control over of the firm.

For institutional ownership we also use two measures. *Institutional ownership* is the aggregate holdings of common stocks held by all reporting institutions as a group. It is calculated as a percent of the total number of shares outstanding. The second measure is *Institutional HHI,* which is the Herfindahl-Hirschman Index (HHI) of concentration of the top 15 institutional owners for every single firm. It is defined as $\sum_{i=1}^{15} h_i^2$, where h_i is the percentage of ownership of institution i. We are using a measure of the concentration of institutional ownership in addition to a measure of the total ownership since previous work showed that institutions influence more when they are large shareholders (Shleifer and Vishney (1986)) and when they can form a coalition (Black (1992)). The concentration measure can capture this ability better than the total ownership measure.

The monitoring ability of debtholders and availability of cash flow are captured by firms' leverage. The variable *Leverage* is defined as long-term debt divided by the total book value of assets.

SR Firms and *SI Firms* correspond to the number of SR and SI firms classified by two-digit standard industry classification (SIC) code. *Total Number of Firms* corresponds to the total number of firms in each industry. *Percent of SI Firms* is *SI Firms* divided by *Total Number of Firms*.

SIC Code	Industry Description	SR Firms	SI Firms	Total Number of Firms	Percent of SI Firms
10	Metal mining	4	6	10	60%
12	Coal mining	0	3	3	100%
13	Oil and gas extraction	54	12	66	18%
14	Nonmetallic minerals, except fuels	3	1	4	25%
15	General building contractors	16	3	19	16%
16	Heavy construction, except buildings	5	1	6	17%
17	Special trade contractors	5	0	5	0%
20	Food and kindred products	38	8	46	17%
21	Tobacco products	0	0	0	----
22	Textile mill products	8	0	8	0%
23	Apparel and other textile products	15	1	16	6%
24	Lumber and wood products	10	4	14	29%
25	Furniture and fixtures	14	2	16	13%
26	Paper and allied products	25	3	28	11%
27	Printing and publishing	30	9	39	23%
28	Chemical and allied products	163	48	211	23%
29	Petroleum and coal products	4	10	14	71%
30	Rubber and miscellaneous plastic products	15	3	18	17%
31	Leather and leather products	9	1	10	10%
32	Stone, clay, and glass products	7	4	11	36%
33	Primary metal industries	26	7	33	21%
34	Fabricated metal products	22	4	26	15%
35	Industrial machinery and equipment	129	12	141	9%
36	Electronic and other electrical equipment	165	11	176	6%
37	Transportation equipment	30	7	37	19%
38	Instruments and related products	125	5	130	4%
39	Miscellaneous manufacturing products	15	1	16	6%
40	Railroad transportation	4	4	8	50%
42	Trucking and warehousing	15	2	17	12%
44	Water transportation	7	0	7	0%
45	Transportation by air	17	1	18	6%

Table IV.2: The Distribution of SR (Socially Responsible) and SI (Socially Irresponsible) Firms by Two-Digit SIC Code

SIC Code	Industry Description	SR Firms	SI Firms	Total Number of Firms	Percent of SI Firms
46	Pipelines, except natural gas	1	0	1	0%
47	Transportation services	7	2	9	22%
48	Communications	70	9	79	11%
49	Electric, gas, and sanitary services	56	16	72	22%
50	Wholesale trade - durable goods	44	2	46	4%
51	Wholesale trade- nondurable goods	17	4	21	19%
52	Building materials and gardening	5	1	6	17%
53	General merchandise stores	19	2	21	10%
54	Food stores	11	2	13	15%
55	Auto dealers and service stations	14	2	16	13%
56	Apparel and accessory stores	36	6	42	14%
57	Furniture and home furnishings	17	1	18	6%
58	Eating and drinking places	29	3	32	9%
59	Miscellaneous retail	48	7	55	13%
60	Depository institutions	253	42	295	14%
61	Nondepository institutions	21	4	25	16%
62	Security and commodity brokers	29	5	34	15%
63	Insurance carriers	79	17	96	18%
64	Insurance agents, brokers, services	15	1	16	6%
65	Real estate	4	4	8	50%
67	Holding and other investment offices	137	11	148	7%
70	Hotels and other lodging places	7	2	9	22%
72	Personal services	5	4	9	44%
73	Business services	269	19	288	7%
75	Auto repair, services, and parking	5	0	5	0%
78	Motion pictures	8	3	11	27%
79	Amusement and recreation services	2	5	7	71%
80	Health services	30	14	44	32%
81	Legal services	1	0	1	0%
82	Educational services	11	0	11	0%
83	Social services	2	1	3	33%
87	Engineering and management services	42	8	50	16%
99	Conglomerates	4	1	5	20%
Total		2278	371	2649	14%

Table IV.2: continued

Control Variables We include several control variables in the analysis to control for industry and firm characteristics. To capture industry effects, we include sixty-four dummy variables for each 2-digit SIC code. Firm size is measured by the natural log of the book value of total assets. We proxy for growth opportunities using the market to book ratio, calculated as the market value of assets divided by the book value of assets. The 60 months return volatility of the firm's share is our proxy for firm's risk. Firm's age is measured by the number of years since the firm's share price appeared on the CRSP tape.

Summary Statistics Table IV.3 presents difference of means tests between SR and SI firms. SI firms represent 14% of our sample. The table provides the t-statistics and the Industry Adjusted t-statistics, where each observation is adjusted by subtracting the 2-digit SIC code industry mean of the relevant variable. The later provides a cleaner way to test the significance of the variable once industry effects are accounted for.

We find that SR firms have an insiders' ownership level which is lower by 4% than that of SI firms. Moreover, 17% of SI firms are controlled by insiders (i.e., insiders' ownership of more than 50%) while this is the case in only 9% of the SR firms. While there is a distinct difference in the holdings of insiders between SR and SI firms, there is no significant difference in the institutional ownership measures. Consistent with our hypothesis, SR firms tend to have lower leverage than SI firms. With respect to age and size, SR firms are younger and smaller than SI firms. The univariate analysis also suggests that SR firms tend to have a higher market to book ratio and that their shares are more volatile than those of SI firms. Concerning firms' classification, 51.6% of SR firms are listed on the Nasdaq stock exchange compared to 28% of SI firms. There is also some evidence that west coast firms are more socially responsible; 27.5% of SR firms' headquarters are in the west cost, compared to only 18.3% of SI firms. Firms

which are part of the S&P 500 represent 18.9% of our sample. However, included in the S&P 500 are 14.6% of the SR firms and 27.9% of the SI firms. This again suggests that size is an important factor determining the classification of a firm to be either SR or SI.

4.3 Multivariate Analysis

Multivariate Analysis of CSR In this section we investigate the relation between CSR and the conflict variables. Our measure of the social performance of firms, is *CSR,* a dummy variable which equals one if a firm has passed the qualitative screening conducted by KLD and zero if it failed. The model that we test is the following:

$$\begin{aligned} CSR = \gamma_0 + \gamma_1\ (Insider\ ownership) + \gamma_2\ (Institutional\ ownership) \\ +\ \ \gamma_3\ (Leverage) + \gamma_{4-7}(Control\ variables) + \gamma_{8-71}(Two-digit\ SIC\ code) + \varepsilon \end{aligned} \tag{IV.1}$$

On the right hand side we interchangeably use the variables *Insiders' ownership* and *Insiders' control* as measures of ownership by insiders. Our measures of ownership by institutions are the variables *Institutional ownership* and *Institutional HHI*; we use these variables interchangeably as well. *Leverage* captures potential capital structure effects. The control variables are *Ln total assets*, *Market to book*, *Return volatility* and *Firm's age* as well as sixty four *2-digit SIC code* dummy variables to control for industry effects.

The results with robust standard deviations are presented in Table IV.4. The most striking result in our analysis is that the coefficients of insiders' ownership and leverage are negative and significant at the 1% level across all specifications. On the other hand, the coefficients of institutional ownership are insignificant with inconsistent signs. The economic interpretation of the probit results is that *ceteris paribus*, at the sample means, an increase of one standard deviation

Insiders ownership is the percent of common stock held by all the officers and directors of the company plus beneficial owners who own more than 5 percent of the stock. *Insiders' control* is a dummy variable that equals 1 if insiders as a group have more than 50% of the shares outstanding. *Institutional ownership* is the percent of common stock held by all the reporting institutions as a group. *Institutional HHI* is the Herfindahl-Hirschman Index calculated based on the holdings of the 15 largest institutional investors. *Leverage* is the book value of long-term debt divided by the book value of total assets. *Ln total assets* is the natural log of the book value of assets. *Market to book* is defined as the ratio of the book value of assets plus the difference between the market value of equity and the book value of equity to the book value of assets. *Return volatility* is the standard deviation of share returns during the previous 60 months. *Firm s age* is measured based on the date in which the firm s share price first appeared on the CRSP tape. The classification dummy variables *Nasdaq*, *West coast* and *S&P 500* equal 1 if the firm is traded on Nasdaq, if the firm s headquarter is in the west coast and if the firm is part of the S&P 500 index, respectively. The table provides the *t*-statistics and the Industry Adjusted *t*-statistics, where each observation is adjusted by subtracting the 2-digit SIC code industry mean of the relevant variable. The table provides significance at the five percent (*) level.

	N	SR Firms	SI Firms	*t* - statistic	Industry Adjusted t-statistic
Number of firms	2650	2278	372		
Conflict variables					
Insiders' ownership (%)	2650	18.29	22.37	3.61*	3.58*
Insiders' control (%)	2650	9.00	17.20	4.88*	4.28*
Institutional ownership (%)	2641	60.22	60.00	-0.16	-0.29
Institutional HHI (%)	2650	2.26	2.32	0.34	0.13
Leverage (%)	2589	17.79	24.37	5.85*	4.91*
Control variables					
Ln total assets ($000,000)	2597	6.81	7.74	9.93*	9.15*
Market to book	2594	1.70	1.51	-2.72*	-2.59*
Return volatility (%)	2648	17.11	14.84	-4.35*	-2.52*
Firm's age (years)	2649	15.57	20.22	5.52*	3.13*
Classification					
Nasdaq (%)	2650	51.62	27.96	-8.58*	-6.54*
West coast (%)	2650	27.48	18.28	-3.75*	-1.90
S&P 500 (%)	2650	14.62	23.66	4.44*	3.55*

Table IV.3: Difference of means teats

Insiders ownership is the percent of common stock held by all the officers and directors of the company plus beneficial owners who own more than 5 percent of the stock. *Insiders' control* is a dummy variable that equals 1 if insiders as a group have more than 50% of the shares outstanding. *Institutional ownership* is percent of common stock held by all the reporting institutions as a group. *Institutional HHI* is the Herfindahl-Hirschman Index calculated based on the holdings of the 15 largest institutional investors. *Leverage* is the book value of long-term debt divided by the book value of total assets. *Ln total assets* is the natural log of the book value of assets. *Market to book* is defined as the ratio of the book value of assets plus the difference between the market value of equity and the book value of equity to the book value of assets. *Return volatility* is the standard deviation of share returns during the previous 60 months. *Firm s age* is measured based on the date in which the firm s share price first appeared on the CRSP tape. All specifications include *2-digit SIC code* indicators. The table provides *z*-statistics calculated with robust standard deviations.

	(1)	(2)	(3)	(4)
Intercept	1.8623	1.5431	1.9173	1.6810
	(2.34)	(1.99)	(2.44)	(2.19)
Insiders' ownership	-0.0098		-0.0102	
	(-5.09)		(-6.10)	
Insiders' control		-0.5341		-0.5943
		(-4.76)		(-5.79)
Institutional ownership	0.0006	0.0019		
	(0.35)	(1.07)		
Institutional HHI			0.0683	-0.0438
			(0.08)	(-0.05)
Leverage	-0.5884	-0.6073	-0.5786	-0.5880
	(-3.06)	(-3.18)	(-3.01)	(-3.09)
Ln (total assets)	-0.2067	-0.1960	-0.2060	-0.1910
	(-7.69)	(-7.37)	(-7.91)	(-7.53)
Market to book	0.0548	0.0582	0.0550	0.0613
	(1.42)	(1.51)	(1.42)	(1.56)
Return volatility	0.3011	0.3686	0.2849	0.3062
	(0.57)	(0.70)	(0.54)	(0.58)
Firm's age	-0.0008	-0.0002	-0.0008	-0.0003
	(-0.33)	(-0.07)	(-0.34)	(-0.13)
N	2537	2537	2546	2546
"Pseudo R^2"	0.143	0.141	0.143	0.141

Table IV.4: The Relation between CSR and the Conflict Variables - Probit Regressions

in total insiders' ownership of firm i, decreases the probability that KLD would define firm i as socially responsible by 3.8%. Similarly, an increase of one standard deviation in the leverage of firm i, decreases the probability that KLD would define firm i as socially responsible by 2.2%. In contrast, an increase in the total institutional ownership or in the institutional concentration of firm i, does not change the probability that KLD would define firm i as socially responsible.

Some additional information regarding the prospects of SR firms can be learned from the coefficients of the control variables. We find that SR firms tend to be smaller in size as measured by book value of assets. On the other hand, the multivariate analysis suggests that the growth prospects of firms, their risk and their age do not add significant contribution in explaining the variance of CSR.

Our results show that insiders' holdings are negatively correlated with CSR ratings. According to our hypothesis, insiders who are affiliated with the firm are those who gain private benefits from a high CSR rating. The interpretation of this negative correlation in light of our hypothesis is that at high ownership levels, insiders' cost from increasing CSR expenditure (which yields a higher CSR rating) is larger than their benefits. In other words, insiders downplay the importance of their private benefits compared to firm value simply because they own more of the firm. Thus, the negative relation suggests that the cost incorporated in CSR is significant.[5]

The negative correlation between leverage and CSR also supports the CSR-conflict hypothesis. If leverage plays a conflict mitigating role as suggested by the literature (e.g., Harvey, Lins and Roper (2004)), a higher leverage makes firms spend less on CSR. Lastly, the results reveal that institutional holdings are not

[5]Throughout the paper we assume for presentation simplicity that all insiders gain private benefits from CSR expenditure. However, the interpretation of the empirical results remains the same even if only a portion of insiders benefit from CSR. Under such circumstances, an increase in the ownership of insiders who do not benefit from CSR should mitigate the CSR-conflict due to better monitoring, and even strengthen our results.

correlated with CSR. This may be attributed to the reasons discussed above.

A Relative CSR Measure (RCSR) One of the limitations of the study is that we do not observe a continuous measure for CSR ratings and are constrained to use a binary one. The problem with this measure is that it does not provide a cardinal CSR rating that distinguishes between different SR and SI firms. For example, it imposes the assumption that all SR firms (and similarly all SI firms) have the same rating across different firm industries.

To illustrate the problem, consider for example a firm in a high-tech industry and a firm in an oil industry. By the nature of these two industries it is easier for a high-tech company to achieve a higher social rating as its operations do not pollute the environment. In fact, an oil company that has the same CSR rating as a high-tech company probably needs a much higher CSR expenditure in order to achieve this rating. In other words, the importance of the conflict variables should be larger in firms which defy their characteristics. Other firm characteristics such as size, age and growth opportunities may also be important in defining the relation between the conflict variables and the CSR ratings.

In order to overcome this problem, we develop a methodology that maps the binary dependent variable into a continuous one. We are doing so by decomposing the explained component of CSR that is due to firm characteristics and giving a higher weight to firms that defy their characteristics. This allows us to investigate the relation between the conflict variables and the CSR rating in a way that emphasizes the importance of firm characteristics in setting CSR ratings.

The methodology is composed of three steps. First, we run a probit regression where the dependent variable CSR is regressed on firm characteristics.

$$\begin{aligned} CSR &= \gamma_0 + \gamma_1(Ln\ total\ assets) + \gamma_2(Market\ to\ book) + \gamma_3(Return\ volatility) \\ &\quad + \gamma_4(Firm's\ age) + \gamma_{5-68}(Two-digit\ SIC\ code) + \varepsilon \end{aligned} \tag{IV.2}$$

From this regression we obtain the predicted probability, $\widehat{CSR}$, that a firm re-

ceives an SR rating ($CSR = 1$) solely due to its characteristics.

In the second step we define a relative corporate social responsibility measure, $RCSR$.

$$\begin{aligned} RCSR &= [sign(\hat{\varepsilon})](\hat{\varepsilon})^2 \\ \text{where } \hat{\varepsilon} &= CSR - \widehat{CSR} \end{aligned} \tag{IV.3}$$

A higher $RCSR$ value represents a more socially responsible firm. $RCSR$ is technically capped in the interval $[-1, 1]$ since $\widehat{CSR}$ is a probability measure. The $RCSR$ measure conserves the sign and squares the magnitude of the error.[6] Since a high $\hat{\varepsilon}$ denotes a high divergence from the predicted probability as defined by the firm's characteristics, the $RCSR$ measure rewards SR firms with a high $\hat{\varepsilon}$ and punishes SI firms with a high $\hat{\varepsilon}$. It emphasizes firms that do not confirm to their characteristics.

In the final step, we study the conflict variables' impact on ratings by running different specifications of the following relation:

$$RCSR = \delta_0 + \delta_1\ (Insider\ ownership) + \delta_2\ (Institutional\ ownership) + \delta_3\ (Leverage) + \epsilon \tag{IV.4}$$

This regression allows us to study whether the conflict variables' explanatory power changes once the observations are rescaled to reflect the degree of conformity with the firm's peers.

By way of construction, the $RCSR$ measure is not normally distributed. It is capped in the range $[-1, 1]$ and because some industries have more observations than others, there are many clusters of observations in certain ranges of the variable. The common way of estimating a regression under such circumstances is to employ a bootstrap methodology. We randomly draw, with replacement, N observations (where N is the original sample size) from the data set. Using each

[6] Note that without squaring the errors this methodology simply splits the one step probit regression (table IV.4) into two steps.

Insiders ownership is the percent of common stock held by all the officers and directors of the company plus beneficial owners who own more than 5 percent of the stock. *Insiders' control* is a dummy variable that equals 1 if insiders as a group have more than 50% of the shares outstanding. *Institutional ownership* is percent of common stock held by all the reporting institutions as a group. *Institutional HHI* is the Herfindahl-Hirschman Index calculated based on the holdings of the 15 largest institutional investors. *Leverage* is the book value of long-term debt divided by the book value of total assets. The standard deviations used to compute t-statistics are calculated using the bootstrap methodology.

	(1)	(2)	(3)	(4)
Intercept	-0.0256	-0.0505	-0.0244	-0.0411
	(-1.60)	(-3.75)	(-2.86)	(-5.53)
Insiders' ownership	-0.0013		-0.0013	
	(-4.39)		(-4.80)	
Insiders' control		-0.0804		-0.0852
		(-3.93)		(-4.26)
Institutional ownership	0.0000	0.0001		
	(0.08)	(0.76)		
Institutional HHI			0.0031	0.0018
			(0.02)	(0.01)
Leverage	-0.0825	-0.0808	-0.0818	-0.0789
	(-3.07)	(-3.02)	(-3.08)	(-3.01)
N	2537	2537	2546	2546
R^2	0.017	0.016	0.016	0.015

Table IV.5: The relation between RCSR and the conflict variables - OLS regressions

sample, we calculate the coefficients. We repeat this procedure 10,000 times to build a dataset of estimated coefficients. This allows us to calculate the standard deviations of the coefficients and compute their t-statistics accurately.

Table IV.5 reports OLS regressions where *RCSR* is regressed on the conflict variables. Similar to our previous findings, we find that ownership by insiders and debt have a significant negative effect on *RCSR*. We also find that ownership by institutions has no significant effect on *RCSR*.

We view the *RCSR* measure as an important addition to our analysis. Therefore, throughout the rest of the study we provide the regression results for both *CSR* and *RCSR*.

Piece-wise Regression So far, our analysis allowed only for a linear relation between ownership by insiders and CSR. In order to analyze whether a possible non-linearity is present in the data, we follow Morck, Shleifer and Vishny (1988) and perform piece-wise regressions which allow the coefficients of *Insiders' ownership* to vary over three different segments of ownership.

This procedure allows us to investigate the trade-off between the alignment and entrenchment of insiders. At low levels of ownership, an increase in insiders' holdings not only makes them bear more of the cost of CSR expenditure, but also gives them more control to pursue a pro-CSR agenda. Therefore, it is not clear which is the dominant force and how the CSR rating should be affected. However, once insiders are entrenched, a further increase in their ownership should only result in bearing more of the cost associated with CSR.

The results of the piece-wise regressions are shown in Table IV.6. The analysis suggests that at low levels of ownership by insiders (up to 25%) there is no relation between insiders' ownership and CSR, while at levels above 25% the relation is negative and highly significant. This is somewhat consistent with Morck Shleifer and Vishny (1988) who document a positive relation with Tobin's Q at small holdings of 0%-5%, a negative relation at holdings of 5%-25% and a positive relation again, at holdings greater than 25%.

Instrumental Variable (IV) Approach One may argue that our analysis potentially suffers from an endogeneity problem. Specifically, one could claim that insider and institutional ownership are determined by the CSR rating and not vice versa. For example, it may be the case that socially responsible investing (SRI) plays an important role in setting the holdings of institutional investors. Since most socially responsible investors implement their investing strategy using institutions such as mutual funds and pension funds, one could expect to see higher ownership by institutions at SR firms relatively to SI firms. In order to

Insiders' ownership is divided to three different segments of ownership. Following Morck, Shleifer and Vishney (1988), *Insiders 0 to 5* equals *Insiders' ownership* if *Insiders' ownership* < 5% and equals 5% if *Insiders' ownership* ≥ 5%; *Insiders 5 to 25* equals 0% if *Insiders' ownership* < 5%, equals *Insiders' ownership* - 5% if 5% < *Insiders' ownership* < 25% and equals 20% if *Insiders' ownership* ≥ 25%; *Insiders over 25* equals 0% if *Insiders' ownership* < 25% and equals *Insiders' ownership* - 25% if *Insiders' ownership* ≥ 25%. *Institutional ownership* is percent of common stock held by all the reporting institutions as a group. *Institutional HHI* is the Herfindahl-Hirschman Index calculated based on the holdings of the 15 largest institutional investors. *Leverage* is the book value of long-term debt divided by the book value of total assets. *Ln total assets* is the natural log of the book value of assets. *Market to book* is defined as the ratio of the book value of assets plus the difference between the market value of equity and the book value of equity to the book value of assets. *Return volatility* is the standard deviation of share returns during the previous 60 months. *Firm s age* is measured based on the date in which the firm s share price first appeared on the CRSP tape. Specifications (1) and (2) include *2-digit SIC code* indicators. The table provides *z*-statistics with robust standard deviations (specifications (1) and (2)) and *t*-statistics that were calculated using the bootstrap methodology (specifications (3) and (4)).

Dependent Variable	CSR (Probit)		RCSR (OLS)	
	(1)	(2)	(3)	(4)
Intercept	1.8949	1.9411	-0.0291	-0.0280
	(2.36)	(2.45)	(-1.43)	(-2.09)
Insiders 0 to 5	-0.0264	-0.0268	-0.0022	-0.0023
	(-0.92)	(-0.94)	(-0.61)	(-0.64)
Insiders 5 to 25	-0.0035	-0.0036	-0.0001	-0.0001
	(-0.55)	(-0.59)	(-0.12)	(-0.12)
Insiders over 25	-0.0122	-0.0127	-0.0020	-0.0020
	(-3.99)	(-4.32)	(-3.52)	(-3.58)
Institutional ownership	0.0006		0.0000	
	(0.33)		(0.08)	
Institutional HHI		0.1113		0.0169
		(0.12)		(0.09)
Leverage	-0.5834	-0.5741	-0.0805	-0.0798
	(-3.02)	(-2.98)	(-3.00)	(-3.02)
Ln (total assets)	-0.2072	-0.2063		
	(-7.48)	(-7.70)		
Market to book	0.0557	0.0560		
	(1.44)	(1.44)		
Return volatility	0.3008	0.2874		
	(0.57)	(0.55)		
Firm's age	-0.0008	-0.0008		
	(-0.31)	(-0.32)		
N	2537	2546	2537	2546
R^2 / "Pseudo R^2"	0.144	0.144	0.019	0.018

Table IV.6: Piecewise regressions of Insiders' Ownership: the relation between CSR (RCSR) and the conflict variables

disproof this potential problem we use an instrumental variable approach.

There are three variables that potentially suffer from endogeneity: *Insiders' ownership, Insiders' control,* and *Institutional ownership*. We follow Bennett, Sias and Starks (2003) and use *Turnover* as an instrument for the insider ownership variables.[7] Table IV.8 presents the results of the instrumental variable regression analysis. In regressions (1) and (2) we replace *Insiders' ownership* and *Insiders' control* with the predicted value of these variables regressed on *Turnover*, *Ln total asset*, *Market to book*, *Firm's age*, *Return volatility* and *2-digit SIC* dummy variables. In regressions (3) and (4) we replace *Insiders' ownership* and *Insiders' control* with the predicted value of these variables regressed on *Turnover* alone. The reason for omitting the other control variables is that these are already part of the $RCSR$ measure. Table IV.7 report the results of the first stage of the IV methodology.

In order to avoid a potential endogeneity problem with the variable *Institutional ownership,* we perform the regressions with *Institutional HHI*. We view *Institutional HHI* as a purely exogenous variable (consistent with Hartzell and Starks (2003)) as there is no theoretical reason to believe that the concentration of institutional ownership is the result of the CSR policy of the firm.

Consistent with our earlier results, we find that ownership by insiders and debt are significant and negatively related to firms' CSR ratings and that ownership by institutions is uncorrelated with the ratings.

Robustness Analysis In this section we perform robustness checks. We start with a robustness analysis with respect to size. While we do control for size in our analysis, one may still wonder whether the results hold for subsets of the sample. For example it may be the case that small firms attract less attention from private investors and institutions and therefore it is easier for insiders to

[7] *Turnover* is defined as a three months average of the monthly volume divided by the number of shares outstanding.

The table presents the results of the first stage in the Instrumental-variable, two-stage probit / OLS regressions of CSR and RCSR, where *Turnover* is used as an instrument for *insiders' ownership*. In regressions (1) and (2) *Insiders' ownership* (*Insiders' control*) is regressed on *Turnover*, *Ln total asset*, *Market to book*, *Return volatility*, *Firm's age* and *2 digit SIC codes*. In regressions (3) and (4) *Insiders' ownership* (*Insiders' control*) is regressed on *Turnover*. The table provides *t*-statistics in parenthesis.

Dependent Variable	insiders' ownership		insiders' control	
	(1)	(3)	(2)	(4)
Intercept	52.0808	21.3842	0.0641	0.1259
	(2.75)	(41.11)	(0.22)	(16.15)
Turnover	-2.0182	-1.4710	-0.0212	-0.0142
	(-9.22)	(-7.34)	(-6.25)	(-4.72)
Ln (total assets)	-1.9406		-0.0112	
	(-6.48)		(-2.43)	
Market to book	0.5954		0.0117	
	(1.76)		(2.24)	
Return volatility	12.0498		0.1427	
	(2.13)		(1.63)	
Firm's age	-0.2040		-0.0022	
	(-6.88)		(-4.81)	
N	2592	2648	2592	2648
R^2	0.160	0.020	0.094	0.008

Table IV.7: First stage of the Instrumental Variable regressions

Instrumental-variable, two-stage probit / OLS regressions of CSR and RCSR, where *Turnover* is used as an instrument for *insiders' ownership*. The *Predicted value of insiders' ownership (insiders' control)* in regressions (1) and (2) is the predicted value obtained by regressing *Insiders' ownership* (*Insiders' control*) on *Turnover*, *Ln total asset*, *Market to book*, *Return volatility*, *Firm's age* and *2 digit SIC codes*. The *Predicted value of insiders' ownership (insiders' control)* in regressions (3) and (4) is the predicted value obtained by regressing *Insiders' ownership* (*Insiders' control*) on *Turnover*. *Institutional HHI* is the Herfindahl-Hirschman Index calculated based on the holdings of the 15 largest institutional investors. *Leverage* is the book value of long-term debt divided by the book value of total assets. *Ln total assets* is the natural log of the book value of assets. *Market to book* is defined as the ratio of the book value of assets plus the difference between the market value of equity and the book value of equity to the book value of assets. *Return volatility* is the standard deviation of share returns during the previous 60 months. *Firm s age* is measured based on the date in which the firm s share price first appeared on the CRSP tape. Specifications (1) and (2) include *2-digit SIC code* indicators. The table provides z-statistics with robust standard deviations (specifications (1) and (2)) and t-statistics that were calculated using the bootstrap methodology (specifications (3) and (4)).

Dependent Variable	CSR (Probit)		RCSR (OLS)	
	(1)	(2)	(3)	(4)
Intercept	3.1515	2.2492	0.0090	-0.0166
	(3.35)	(3.18)	(0.35)	(-1.09)
Predicted value of insiders' ownership	-0.0286		-0.0031	
	(-2.05)		(-2.26)	
Predicted value of insiders' control		-2.7226		-0.3199
		(-2.05)		(-2.29)
Institutional HHI	-0.1381	-0.1381	-0.0181	-0.0181
	(-0.13)	(-0.13)	(-0.09)	(-0.09)
Leverage	-0.6071	-0.6071	-0.0797	-0.0797
	(-3.29)	(-3.29)	(-2.98)	(-2.99)
Ln (total assets)	-0.2413	-0.2165		
	(-5.70)	(-6.50)		
Market to book	0.0560	0.0708		
	(1.50)	(1.86)		
Return volatility	0.2158	0.2603		
	(0.41)	(0.50)		
Firm's age	-0.0045	-0.0046		
	(-1.26)	(-1.28)		
N	2546	2546	2546	2546
R^2 / "Pseudo R^2"	0.128	0.128	0.006	0.006

Table IV.8: Instrumental variable regressions: CSR (RCSR) and the conflict variables

affect the CSR policy in these firms compared to large firms. We perform the first robustness check by splitting our sample to two based on the book value of assets. The results of this analysis are reported in Panel A of Table IV.9. In all four specifications ownership by insiders and leverage are negatively significant while institutional ownership is marginally significant in only one specification. While the results of the table reconfirm the CSR-conflict hypothesis, the significance levels and size of insiders' ownership coefficients are larger in small firms. This suggests that the presence of the CSR-conflict is larger in these firms.

In a second robustness analysis we split the sample based on industries' average CSR ratings, where industries are defined by 2-digit SIC codes. Firms are partitioned to two groups according to the percentage of SR firms in their industry; 86.5% is the overall industries median value. Arguably, industry classification is the most important factor in defining the ability of the firm to be classified as SR. Therefore, using this criterion in order to split the sample is a good robustness check. Panel B of table IV.9 reports the results of these regressions. We find some differences between the two sub-samples. While insiders' ownership coefficients are negative and significant in both sub-samples, they are more significant in SI Industries (industries that have less than 86.5% SR firms). With respect to debt, while it is always negatively correlated with the CSR and $RCSR$ measures, it is significant only in SR Industries. Put together, these results show that insiders' ownership is the dominant conflict-mitigating mechanism in SI Industries, while leverage is the dominant mechanism in SR Industries.

4.4 CSR and Corporate Governance

We argue that the CSR-conflict is different than traditional agency conflicts on two dimensions. First, the traditional conflict is between the manager and the shareholders, while the CSR-conflict is between insiders and the other sharehold-

In Panel A, the sample of firms is partitioned according to size (book value of total asset). *Large Firms* refer to large cap firms and *Small Firms* refer to small cap firms respectively. In Panel B, the sample of firms is partitioned according to the percentage of SR firms in the industry, where industry is defined according to the 2-digit SIC code. Firms that belong to an industry where the percentage of SR firms is higher than 86.5% (overall industry median value) are part of the first sub sample, and firms that belong to an industry where the percentage of SR firms is lower than 86.5% are part of the second sub sample. *Insiders ownership* is the percent of common stock held by all the officers and directors of the company plus beneficial owners who own more than 5 percent of the stock. *Insiders' control* is a dummy variable that equals 1 if insiders as a group have more than 50% of the shares outstanding. *Institutional ownership* is percent of common stock held by all the reporting institutions as a group. *Institutional HHI* is the Herfindahl-Hirschman Index calculated based on the holdings of the 15 largest institutional investors. *Leverage* is the book value of long-term debt divided by the book value of total assets. *Ln total assets* is the natural log of the book value of assets. *Market to book* is defined as the ratio of the book value of assets plus the difference between the market value of equity and the book value of equity to the book value of assets. *Return volatility* is the standard deviation of share returns during the previous 60 months. *Firm s age* is measured based on the date in which the firm s share price first appeared on the CRSP tape. Specifications (1) and (2) include *2-digit SIC code* indicators. The table provides z-statistics with robust standard deviations (specifications (1) and (2)) and t-statistics that were calculated using the bootstrap methodology (specifications (3) and (4)).

Panel A: Size Partitioning

Dependent Variable	CSR (Probit)		RCSR (OLS)	
	Large Firms (1)	Small Firms (2)	Large Firms (3)	Small Firms (4)
Intercept	1.0200	2.2609	-0.0712	0.0274
	(1.05)	(2.23)	(-2.93)	(1.32)
Insiders' ownership	-0.0049	-0.0149	-0.0007	-0.0020
	(-1.81)	(-5.15)	(-1.67)	(-4.89)
Institutional ownership	0.0039	-0.0026	0.0005	-0.0005
	(1.53)	(-0.96)	(1.44)	(-1.78)
Leverage	-0.5704	-0.5371	-0.0763	-0.0864
	(-1.73)	(-1.95)	(-1.83)	(-2.31)
Ln (total assets)	-0.2182	-0.2837		
	(-5.72)	(-3.29)		
Market to book	0.2917	-0.0258		
	(3.49)	(-0.70)		
Return volatility	0.3854	0.1209		
	(0.39)	(0.19)		
Firm's age	-0.0003	-0.0028		
	(-0.10)	(-0.51)		
N	1216	1175	1268	1269
R^2 / "Pseudo R^2"	0.152	0.135	0.011	0.032

Table IV.9: Robustness Analysis by Size and Industry: CSR (RCSR) and the Conflict Variables

Panel B: Industry Partitioning				
Dependent Variable	CSR (Probit)		RCSR (OLS)	
	SR Industries	SI Industries	SR Industries	SI Industries
	(1)	(2)	(3)	(4)
Intercept	1.9831	1.9985	0.0024	-0.0399
	(3.48)	(2.39)	(0.10)	(-1.82)
Insiders' ownership	-0.0060	-0.0119	-0.0008	-0.0018
	(-1.82)	(-4.93)	(-2.07)	(-4.20)
Institutional ownership	-0.0007	0.0014	-0.0003	0.0001
	(-0.24)	(0.59)	(-1.09)	(0.45)
Leverage	-1.0272	-0.2108	-0.1116	-0.0482
	(-3.80)	(-0.84)	(-3.12)	(-1.23)
Ln (total assets)	-0.0997	-0.2560		
	(-2.11)	(-7.56)		
Market to book	0.0124	0.0800		
	(0.29)	(1.32)		
Return volatility	0.5783	0.1621		
	(0.73)	(0.22)		
Firm's age	0.0032	-0.0024		
	(0.68)	(-0.79)		
N	1244	1293	1292	1293
R^2 / "Pseudo R^2"	0.057	0.134	0.017	0.024

Table IV.9: continued

ers. Second, corporate social responsibility has a positive public appeal, while traditional agency conflicts have a negative appeal. In fact, in contrary to the theme of this chapter, which claims that CSR activity may decrease firm value, there is a perceived link that good corporate governance and good corporate social responsibility go together. Perhaps this is because both are regarded as an ethical behavior on part of the firm. It is interesting, therefore, to examine whether this link has some empirical evidence that supports it.

We use the index proposed by Gompers, Ishii and Metrick (2003) (GIM) as our measure of the corporate governance level of the firm. The index is constructed by analyzing 24 distinct corporate governance provisions. It adds one point for every provision that reduces shareholder rights; that is, a high score represents bad corporate governance. The univariate correlation between the GIM index and CSR is marginally negative ($-.04$) and it is marginally positive with $RCSR$ (0.01). Furthermore, in a multivariate analysis that we do not report here, we find that the GIM index is not significant in explaining either CSR nor $RCSR$. We conclude that there is no empirical evidence that supports the relation between CSR and corporate governance as measured by the GIM index.

Throughout the chapter the results indicate that insiders' ownership and debt are negatively related to firms' CSR ratings, while institutional ownership does not affect them. While there are reasons why institutions may choose not to affect CSR (see our discussion above), the question is still left open. We use the GIM index to get a better understanding of this phenomenon.

Similarly to the CSR ratings, the GIM index should be related to the ownership structure of the firm as the shareholders are those who set the conflict-mitigating mechanisms in place. Table IV.10 reports the results of regressing the GIM index on the ownership structure, the capital structure and the control variables of our analysis. We find that ownership by insiders is significant in improving corporate governance. Similarly, there is strong evidence that insti-

tutional ownership concentration positively affects corporate governance. These results support the idea that institutions tend to be active at least on some standard corporate governance issues such as poison pills and golden parachutes provisions. On the other hand, the fact that institutions do not affect CSR hints that they find it hard to oppose it or that they do not consider CSR at the same token as other types of conflicts.

4.5 Conclusions

In this chapter we find strong supportive evidence to the hypothesis that CSR is a source of a conflict between different shareholders. In this conflict insiders personally benefit from the fact that they are associated with firms that have a high CSR rating. The conflict is mitigated if insiders hold a large fraction of the firm. Similarly, debt serves as a conflict-mitigating mechanism. Lastly, we find no evidence that institutions have a monitoring role on CSR policies.

The CSR-conflict can be viewed from two different normative perspectives. On the one hand, we find supportive evidence to the claim that the chosen level of CSR expenditure is greater than that which maximizes firm value. This typically has a negative connotation as it decreases value for shareholders. On the other hand, the CSR-conflict leads to the promotion of a social agenda, which can be viewed in a positive way. Given that most agency conflicts are perceived as self-serving behavior of managers at the expense of other shareholders, it is somewhat ironic to show that the CSR-conflict results in greater alignment of corporate and social goals. From a social welfare perspective, whether this conflict increases total welfare depends on the question whether firms have a relative advantage in contributing to the society.

The GIM index is regressed on the conflict and control variables used in this paper. *GIM* is the "Governance Index" proposed by Gompers, Ishii and Metrick (2003). *Insiders ownership* is the percent of common stock held by all the officers and directors of the company plus beneficial owners who own more than 5 percent of the stock. *Insiders' control* is a dummy variable that equals 1 if insiders as a group have more than 50% of the shares outstanding. *Institutional ownership* is percent of common stock held by all the reporting institutions as a group. *Institutional HHI* is the Herfindahl-Hirschman Index calculated based on the holdings of the 15 largest institutional investors. *Leverage* is the book value of long-term debt divided by the book value of total assets. *Ln total assets* is the natural log of the book value of assets. *Market to book* is defined as the ratio of the book value of assets plus the difference between market value of equity and the book value of equity to the book value of assets. *Return volatility* is the standard deviation of share returns during the previous 60 months. *Firm s age* is measured based on the date in which the firm s share price first appeared on the CRSP tape. All specifications include *2-digit SIC code* indicators.

	(1)	(2)	(3)	(4)
Intercept	10.1588	11.4096	10.9211	10.2011
	(17.51)	(17.05)	(22.79)	(21.59)
Insiders' ownership	-0.0334		-0.0290	
	(-7.21)		(-7.53)	
Insiders' control		-1.3245		-1.2602
		(-4.10)		(-4.79)
Institutional ownership	-0.0049	0.0032		
	(-1.16)	(0.76)		
Institutional HHI			-4.8082	-5.5401
			(-3.09)	(-3.50)
Leverage	0.4865	0.3773	0.4991	0.4490
	(1.34)	(1.02)	(1.38)	(1.20)
Ln (total assets)	0.0296	0.0747	0.0171	0.0621
	(0.51)	(1.31)	(0.30)	(1.08)
Market to book	-0.1075	-0.1160	-0.1257	-0.1313
	(-1.65)	(-1.76)	(-1.93)	(-2.00)
Return volatility	-5.0147	-4.4515	-4.9951	-4.9231
	(-4.92)	(-4.35)	(-5.07)	(-5.00)
Firm's age	0.0306	0.0336	0.0316	0.0332
	(6.58)	(7.16)	(6.82)	(7.11)
N	1417	1417	1422	1422
R^2	0.203	0.182	0.207	0.188

Table IV.10: The Relation between GIM and the Conflict Variables - OLS Regressions

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CHAPTER V
CONCLUSIONS

CSR receives a higher priority on corporate agendas in recent years and firms allocate more and more resources to CSR. In this dissertation we analyze potential driving forces behind this corporate behavior focusing on socially responsible investing and potential conflicts between affiliated and unaffiliated shareholders.

The second chapter explores the effects of ethical screening on firms' decisions to reform and on their investment levels. These issues are examined in an equilibrium setting with endogenous investment decisions and endogenous future outputs. The effects on total investment are examined in the presence of various levels of reforming costs. The results indicate that in intermediate cases when reforming costs are about 6% of revenue, the economy exhibits its maximum total investment when there are either no socially responsible investors or when there are only socially responsible investors. If one assumes that socially responsible investors account for about 10□12% of total investors, as estimated to be the fraction of total managed funds which are subject to SRI strategies, their presence lowers total investment in the economy but is not enough to induce firms to change their technology to a CSR-approved one.

The third chapter further explores the role of socially responsible investors in a much richer framework by assuming that some investors gain direct utility from owning firms that practice CSR. We show how this concern impacts investors' risk-sharing opportunities, equilibrium prices and value-maximizing firms' decisions about practicing CSR.

The major finding of this chapter is that policy variables, such as tax rates imposed on individuals and corporations and the limit on net income that can be used for CSR spending and qualify for a tax rebate, influence the Social Surplus (defined as total individual donations plus corporate CSR spending less the tax rebates given for such spending) in important ways. First, the social surplus is

monotonically decreasing in the tax rebate given to individual donations. Because changing the individual tax rebate rate does not influence corporate CSR spending, raising the rebate rate generates less new individual donations than the additional tax rebates given, causing social surplus to be lower. On the other hand, social surplus is non-monotonic in the corporate tax rebate. That is, there is a social-surplus-maximizing level for the corporate tax rebate rate, for any given set of parameters.

Another important parameter that we analyze is the limit on net income that can be used for CSR spending and qualify for a tax rebate (any CSR spending beyond the limit generates no additional tax rebate). We take the rebate limit as given. This limit may exist as a political compromise between groups favoring CSR tax rebates and those that feel such spending is outside the area of corporate responsibility. Alternatively, some may view CSR spending as an agency problem, benefiting management at the expense of shareholders. Whatever the reason for the tax rebate limit, its level influences the social surplus-maximizing level of the corporate tax rebate rate. Raising the tax rebate limit leads to higher optimal tax rebate rates, up to a maximum, past which the optimal tax rebate rate is constant.

While socially responsible investing seems to have only a marginal impact on firms' behavior if the proportion of socially responsible investors is about 11%, it appears that the dramatic change in stakeholders' preferences and its effect on profitability is what makes CSR so visible. The optimal level of CSR expenditure with respect to firm value is simply much higher than it used to be only a few years ago and firms are responding to it by spending more and advertising their social records. But is the actual amount that firms spend on CSR optimal?

Under the umbrella of CSR there are many corporate activities; among them are employer-employee relations, community involvement, environmental issues, product safety and many more. It is probably impossible both for managers and

for shareholders to identify the exact level of CSR expenditure which is consistent with maximizing firm value. The hypothesis of the fourth chapter is that this "grey" area can allow insiders (affiliated shareholders) to over-invest in CSR for their private benefit in cases in which there are looser monitoring mechanisms since CSR spending improves their reputation as being good citizens.

We test this hypothesis by investigating the relation between firms' CSR ratings and their ownership and capital structure. We employ a unique data set that categorizes the 3,000 largest US corporations to being either socially responsible or socially irresponsible. We find that insiders' ownership and leverage are negatively related to the social rating of firms, while institutional ownership is uncorrelated with it. These results support the hypothesis that CSR is indeed a source of a conflict between different shareholders.

Corporate social responsibility is all about doing good. Therefore, it is probably hard even for the toughest shareholders' representative to object allocating resources to a good cause even in cases in which the contribution to firm value is questionable. For example it is probably much easier for an outside director to oppose allocating golden parachutes for managers than to vote against donations to the tsunami victims in Asia. This can help explaining our empirical finding that in some cases firms deviate from the optimal level of CSR expenditure and simply spend too much on these issues.