Corporate social responsibility, agency problems and social pressure

by Dion Tops

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Abstract

In this study I find evidence that CSR is partially the result of agency problems. Using an empirical strategy based on managerial incentives, I find evidence indicating that when top executives are better incentivized they reduce CSR expenditures, implying the marginal investment in CSR reduces firm value. The findings also indicate that firms respond to social pressure by increasing CSR expenditures and social pressure negatively moderates the positive relation between CSR rating and firm value. Furthermore, when top executives are better incentivized and consequently reduce CSR expenditures, they reduce CSR expenditures more strongly the greater the social pressure. These findings are consistent with the theory that managers may commit to socially responsible behaviour to gain stakeholder support, at the expense of shareholders. However, the findings indicate that also in the absence of social pressure top executives reduce CSR expenditures as they are better incentivized, consistent with (but no direct evidence of) that managers invest in inefficient CSR because they like to give. Lastly, I find evidence that institutional shareholders reduce CSR expenditures as their ownership in the firm increases, consistent with that institutional shareholders in general actively monitor and reduce inefficient CSR expenditures.

Chapter 1 – Introduction

According to Carroll (1979), CSR is defined as corporate integrated responsibilities encompassing the economic, legal, ethical, and discretionary (or philanthropic) expectations that the society has of organizations. The classical view in finance on firms takes a shareholder value maximization view, meaning that firms are accountable only to their value-maximizing shareholders and have no responsibility for the interests of other stakeholders, including societal welfare (Friedman, 1970), since these would not increase or would even decrease shareholder value. However, in reality more and more firms engage in activities that are not directly linked to shareholder value maximization, such as engaging in environmental friendly production, avoiding low cost child labour and organizing projects to help the poor. All of these activities fall under the category of corporate social responsible activities. In other words, corporate social responsibility is becoming more and more a mainstream business activity (Kitzmueller & Shimshack 2012). This raises the question for what drives the phenomenon of CSR.

Extending on the shareholder value maximization view, the view where firms are accountable only to their shareholders, one of the two common explanations for why firms invest in CSR is that CSR is simply the result of agency problems within the firm, which is based on agency theory (e.g. Jensen & Meckling, 1976; Jensen, 1986). In the "traditional" agency view based on the shareholder view, managers make non-value maximizing decisions due to being selfish. This implies the incentive of managers to engage in CSR reflects the poor incentives of managers in socially responsible firms. In other words, firms' investments in CSR are a waste of financial resources according to the agency view. Various studies find evidence for that CSR is driven by agency problems (e.g. Cheng, Hong & Shue, 2014; Liang & Renneboog, 2016; Benabou & Tirole, 2010; Krüger, 2015). For example, Krüger (2015) argues that CSR is also part of the firm's business activities because it benefits managers at the expense of shareholders.

The other common explanation for why firms invest in CSR is because doing so increases profitability. This is called the value-enhancing view. Studies that take a stance on the value enhancing view of CSR generally argue that engaging in CSR leads to higher profitability in return. There are various studies that show CSR activities may increase profitability (e.g. Edmans, 2011; Dimson, Karakas & Li, 2015; Derwall et al., 2005; Servaes &

Tamayo, 2013; Dowell, Hart & Yeung, 2000). It is important to mention that some studies argue the reverse; it is not that engaging in CSR leads to higher profitability, but firms that have higher profitability engage more in CSR (e.g. Waddock & Graves, 1997).

The question that follows is through which mechanisms CSR may enhance firm value. Mcwilliams and Siegel (2001) provide a general theoretical model on how CSR enhances firm value through differentiation. They outline a model in which two firms sell identical goods, except one firm adds an additional social attribute/feature to its product. This social attribute/feature is valued by some stakeholders, which results in added benefits for the firm. The benefits of product differentiation (through CSR) may be in the form of new demand or the ability to ask a premium price. If these benefits offset the higher costs associated with engaging in CSR, then CSR enhances firm value. Various studies examine particular mechanisms more in-depth. For example, CSR may enhance firm value because CSR activities can be valued by consumers, who are consequently willing to pay a premium price for goods and services provided by socially responsible firms. Lev et al. (2010) show that individual consumers are sensitive to a firm's social activities, which suggests CSR affects the purchase decision making process of the consumer. Other mechanisms through which CSR may enhance firm value is that the firm may attract more talented employees, employees are more productive and/or employees accept lower wages if the firm engages in CSR (e.g. Turban & Greening, 1997) Furthermore, investors may value the firm's social activities and thus being socially responsible may increase the investor base which in turn reduces cost of capital. For example, Hong and Kacperczyk (2009) argue that norm-constrained investors may consciously decide not to invest in firms with low CSR, which results in a higher equilibrium price for the shares of firms with high CSR due to higher demand. This may be an incentive for firms to increase their CSR in order to attract these norm-constrained investors, which in turn may enhance firm value by lowering the cost of capital through increasing the investor base. Overall, these mechanisms suggest that maximizing stakeholder value may be in line with maximizing shareholder value (stakeholders are generally considered to be the shareholders, customers, employees, suppliers and the local community).

In the shareholder value maximization view managers may engage in CSR if doing so is expected to yield a positive net present value (NPV), which in turn is received positively by shareholders. However, reality is more complex. In reality many firms are required by the

law to take into account the interests of other stakeholders. According to Williams and Aguilera (2008), laws set standards (norms) that influence expectations of society regarding corporate social responsibility, and these expectations act as a focal point around which firms structure their behaviour (McAdams & Nadler, 2005), besides sanction. Williams and Aguilera (2008) further argue that the incentive for firms to engage in CSR is dependent on the strength of various forces, such as community and consumer demands. Aguilera et al. (2007) provide a theoretical model of the determinants of CSR and show how a firm's CSR expenditures can be influenced by, among others, governments (through law enforcement) and non-governmental organizations/activists fuelled by communities (through boycotts, campaigns, dialogues). Various studies have found empirical evidence that external factors, such as regulation/law (e.g. Liang & Renneboog, 2016) and social activism (Dyck & Zingales, 2002), affect a firm's decisions about CSR participation. For example, Liang and Renneboog (2016) show that firms in countries with a legal origin that is more rule-driven (civil law) are associated with higher CSR ratings compared to firms in countries with common law , indicating legislation affects choices for CSR investment. Dyck and Zingales (2002) provide empirical and anecdotal evidence on that social activists use the media to influence corporate policies including a firm's social activities.

Overall, previous studies show that in reality CSR expenditures are likely partly driven by agency problems and also are the result of a trade-off between shareholder demands and other stakeholder demands. The existing empirical literature on the two views of CSR yields mixed evidence for the effect of CSR on firm value, but does tilt towards a small positive relation (e.g. Margolis, Elfenbein & Walsh, 2007; Orlitzky et al., 2003).

The current studies done on the relation between managers and CSR are limited in that they only researched whether or not agency problems are present and/or whether or not CSR contributes to firm value. In this study I examine whether or not managers of firms overinvest in CSR and whether or not this is due to altruism (managers like to give) or social pressure (managers give because they are rewarded if they give or punished if they do not give). The idea is mainly based on Dellavigna, List and Malmendier (2012), who find evidence for that individuals donate to charity due to both social pressure and altruism. I also investigate the influence of institutional owners on the CSR activities of the firm as their role with regards to CSR is not quite clear. As Cheng, Hong and Shue (2014) mention, it is important to investigate further whether or not potential agency problems with regards to

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CSR are driven by social pressure or driven by purer altruistic motives. The reason for the focus on managers and institutional investors is that these two actors have significant influence on the firm's business activities and thus likely on CSR activities as well.

Using the MSCI ESG KLD STATS dataset to measure the firm's CSR rating and social pressure (in combination with data from various other datasets), I find evidence indicating that, all else equal, when top executives are better incentivized they reduce CSR expenditures, which implies that the marginal dollar invested in CSR reduces firm value. Furthermore, when top executives are better incentivized and consequently reduce CSR expenditures, they reduce CSR expenditures more strongly the greater the social pressure. However, the results indicate executives also reduce CSR expenditures when they are better incentivized and not under social pressure, consistent with that executives invest in inefficient CSR activities because they like to give. Overall, the evidence indicates that using mechanisms that should better align the interests of managers with the interests of shareholders results in lower CSR expenditures by management. This suggests that firms with less agency problems (i.e. better incentivized management) have more profitable CSR activities. Furthermore, I find evidence that, all else equal, institutional shareholders reduce CSR expenditures as their holdings of common stock in the firm increases, reinforcing the finding that the marginal investment in CSR is reducing firm value and this finding is consistent with the theory that institutional shareholders in general actively monitor and reduce inefficient (CSR) expenditures.

Chapter 2 – Literature, theoretical framework and hypotheses

The central question in this study is how managers and institutional investors affect the CSR activities of the firm. In this study I adopt the theory that the relation between CSR expenditures of a firm and firm value is non-monotonic and concave. In other words, increasing CSR expenditures contributes to firm value maximization up to a certain point and beyond that optimal point, investing a unit more in CSR decreases firm value. This theory of why there is a concave relation between CSR and firm value, meaning high CSR expenditures do not necessarily enhance firm value, is that the managers of the firm may prefer to overinvest in CSR, which would decrease firm value. Relatively low expenditures on CSR may contribute to firm value, for reasons discussed in *Chapter 1*. As discussed, CSR expenditures may contribute to firm performance if social activities are valued by stakeholders and/or prevent legal & social sanctions. Overall, the theory that there exists a concave relationship between CSR expenditures and firm value is not contradicting the findings that CSR generally enhances firm value and may contribute to explaining what drives CSR.

In this study, I test this theory by mainly studying the relation between managerial/institutional incentives and the social expenditures of the firm. In other words, I test whether or not CSR is at least partially driven by agency problems and investigate the role is of institutional owners in CSR. I will now discuss how managers and institutional investors likely affect the CSR activities of the firm and provide accompanying hypotheses. In Table 1 in *chapter 3* I provide a summary of the predicted relationships based on the hypotheses.

2.1 - Managers

Agency theory (e.g. Jensen & Meckling 1976) argues that managers' interests are not necessarily in line with the interests of other shareholders. Various studies find that agency problems can manifest themselves through non-value-maximizing investment choices (e.g. Shleifer & Vishny, 1989; Shleifer & Vishny, 2000). CSR expenditures are considered a form of investment (e.g. McWilliams and Siegel, 2001). Agency problems in the context of CSR is best described as managers having an incentive to invest in CSR that does not benefit shareholders due to different preferences, which becomes possible due to the separation of ownership and control in combination with incomplete contracts. These incentives for

managers to overinvest can be driven by altruism such as warm-glow, as described by Andreoni (1989, 1990), or perhaps a fairness motivation (e.g. Fehr & Schmidt, 1999). Warm-glow theory (Andreoni 1989, 1990) states that people receive utility from the act of giving in the form of a good feeling. Empirical evidence supports this. For example, Videras and Owen (2006) show that individuals who contribute to the public good of environmental protection report higher levels of life satisfaction and happiness which can be attributed to the warm-glow effect. However, I argue incentives for managers to overinvest in CSR can also be driven by social pressure (e.g. Dellavigna, List & Malmendier, 2012), which is discussed in more detail later. Overall, managers may invest more in CSR than the amount that maximizes firm value due to altruistic motives and/or social pressure.

According to the agency view, the incentive of managers to engage in CSR reflects the poor incentives of managers at socially responsible firms. This implies that firms where managerial incentives are more aligned with shareholder value maximization have less agency problems. Generally, if CSR is driven by agency problems, then managers who have their interests more aligned with shareholder value maximization should invest less in CSR. Demsetz (1983) and Fama and Jensen (1983) argue that with high management ownership comes entrenchment, as more ownership gives managers more power to do as they please. However, as shareholders obtain more and more ownership of the firm, they also bear more and more costs with regards to activities that decrease firm value, such as overinvestments in CSR. This idea is based on Jensen and Meckling (1976), who claim that management deviates less from value-maximization as management ownership rises. According to Morck, Shleifer and Vishny (1988), the relation between management ownership and Tobin's Q is negative in the 5% to 25% ownership range. The relation between management ownership and Tobin's Q is positive for management ownership smaller than 5% and larger than 25%. The authors argue that the incentive for managers to maximize firm value is outweighed by the entrenchment effect in the 5-25% ownership range, meaning that managers make non-value maximizing investment choices when they have between 5% and 25% of stock ownership. They further argue that below 5% and beyond 25% ownership, the incentive for managers to maximize firm value outweighs the entrenchment effect, as an increase in managerial ownership increases firm value. The authors mention that between 0% and 5% management ownership, the positive relation between management ownership and Tobin's Q might be explained by the presence of firms with a lot of intangible assets, for which

Tobin's Q is high, who might require greater management ownership due to ensure proper management. This is further discussed by Demsetz and Lehn (1985). Overall, these findings provide evidence for the presence of agency problems within firms and also provide evidence for that managers their interest converge to the interests of shareholders as their ownership in the firm rises. However, Himmelberg, Hubbard and Palia (1999) argue the significant relationship between firm value (Tobin's Q) and managerial ownership as found by Morck, Schleifer and Vishny (1988) is flawed due to omitted variable bias and find no relationship between firm value and managerial ownership themselves after controlling for various effects, but acknowledge this is not evidence that managerial ownership does not mitigate agency problems. In this study I do take the standpoint that increases in managerial ownership increases managers' incentive to maximize firm value.

Following up on the above, if managers are entrenched and do make non-value maximizing CSR investments, then it follows that the more firm ownership the manager has, the less he/she should be willing to overinvest in corporate social responsible activities and the more incentive he/she has to invest in CSR such that it contributes to firm value. Thus, when a manager chooses to reduce CSR expenditures as his/her ownership in the firm increases, it shows that a unit increase in CSR expenditures driven by this manager decreases firm value, which implies the manager overinvests in CSR.

Furthermore, according to agency theory, managers that are compensated based on their performance should act more in line with interests of the shareholders, because shareholder returns are generally based on firm performance. In other words, pay-for-performance brings the utility function of the manager closer to the utility function of the shareholder. As Masulis, Wang and Xie (2009) state; weak pay-for-performance is widely regarded as a major form of incentive misalignment between managers and shareholders and indicates bad governance. Overall, all else equal, the manager who is paid for performance bears more of the costs associated with non-value maximizing investments compared to the manager that is not paid for performance. Thus, if managers tend to overinvest in CSR due to agency problems, it follows that the more and more the manager's compensation is tied to firm performance, the less he/she should be willing to overinvest in corporate social activities and the more incentive he/she has to invest in CSR such that it contributes to firm value. This negative relation between pay-for-performance and CSR would indicate that a unit increase in CSR expenditures driven by this manager decreases

firm value, which implies the manager overinvests in CSR.

Based on above discussion, I hypothesize:

Hypothesis 1a: *Managerial ownership of a firm is negatively related to the CSR rating.*

Hypothesis 1b: *Managerial pay-for-performance is negatively related to the CSR rating.*

If *Hypothesis 1a* and *Hypothesis 1b* have the predicted beta coefficient sign, it implies managers overinvest in CSR. If so, I investigate further whether or not managers invest in CSR (at the expense of shareholders) due to social pressure and/or altruism. This is relevant, because the literature suggests individuals may overinvest due to altruism and/or social pressure. Altruism as considered in this study means that individuals derive utility from enhancing societal welfare (Andreoni 1989, 1990), which may be in the form of a good feeling (warm-glow effect) and/or because of a fairness motivation (e.g. Fehr & Schmidt, 1999). Such altruism implies individuals like to give and do not have to be rewarded by others. On the other hand, social pressure means that individuals do not like to give but giving is rewarded or prevents disutility and therefore individuals do give (see Dellavigna, List & Malmendier, 2012). Thus, social pressure implies giving is driven by the expectations of others. In a business context, utility from social pressure may incur if the stakeholders reward the firm/manager for complying with their demands and disutility may incur when the stakeholders punish the firm/manager for not complying with their demands. Possibilities of how stakeholders can reward or punish the firm for their CSR have been discussed in the introduction. However, stakeholders may also privately reward or punish managers, which in turn may cause managers to respond to social pressure by investing in inefficient CSR activities. I will discuss these motives in further detail later. All in all, I theorize and test the theory that managers may invest in CSR due to both altruism and social pressure, and do so at the expense of the shareholders. Shareholders are in this study assumed to be focused on risk/return, although I do examine shareholder preferences regarding CSR.

First, if managers receive warm-glow effects from giving and/or have a fairness motivation, they may engage in inefficient CSR activities as long as the positive utility from doing so outweighs the negative utility from reducing firm value. The literature supports the possibility that individuals like to give for reasons other than enhancing or protecting their reputation. Videras and Owen (2006) show that individuals who contribute to the public

good of environmental protection report higher levels of life satisfaction and happiness which can be attributed to the warm-glow effect. Cyert & March (1963) argue that managers bring personal values and beliefs into a firm, suggesting managers may act on warm-glow and fairness motivation. If managers overinvest in CSR at least partially due to altruism, then managers should invest in CSR in the absence of social pressure and should reduce these investments as they bear more of the costs of inefficient investments. If this is true then, in the absence of social pressure, the relation between managerial ownership/incentives and CSR should be negative. This would show that the manager invests in inefficient CSR for reasons other than social pressure, indicating that the marginal investment in CSR which is unrelated to social pressure, is decreasing firm value. I hypothesize:

Hypothesis 2a: *Managerial ownership is negatively related to the CSR rating in the absence of social pressure.*

Hypothesis 2b: *Managerial pay-for-performance is negatively related to the CSR rating in the absence of social pressure.*

Second, if stakeholders who exercise pressure on the firms are able to reward/punish managers beyond rewarding/punishing the firm or at the cost of the firm, then social pressure may lead to inefficient CSR expenditures by managers. For example, Cespa and Cestone (2007) provide a theoretical model where inefficient managers may commit to socially responsible behaviour to gain stakeholder support, and mention this is especially true when political lobbying, social activism and media campaigns have the power to promote/disgrace top executives of large firms. In other words, according to this study inefficient managers may invest in (costly) CSR to enhance/protect their reputation with regards to stakeholders other than shareholders, as a means to entrench themselves (i.e. making themselves more costly to replace by shareholders of the firm). Overall, if stakeholders can reward (punish) managers personally for complying (not complying) with their demands, then managers should be sensitive to social pressure by increasing CSR activities. Furthermore, if managers respond to social pressure by overinvesting in CSR activities, then social pressure should also at least negatively moderate the relationship between CSR and firm value. This would be consistent with that managers invest in stakeholder relationships to protect their reputation, at the expense of the shareholders. I hypothesize:

Hypothesis 3a: *Social pressure is positively related to the CSR rating.*

Hypothesis 3b: *The relationship between CSR rating and Tobin's Q is negatively moderated by social pressure.*

2.2 - Institutional shareholders

An institutional investor is a nonbank person or organization that trades securities in large quantities. There is currently mixed evidence on whether or not institutional investors affect a firm's CSR activities. The agency theory (e.g. Jensen & Meckling, 1976) argues institutional shareholders have an incentive to monitor corporate decision-making due to the size of their investments. This is because investments made by institutions are generally larger than investments made by other investors. As a result, it is more costly for institutional investors to change investments, making their investments less liquid (e.g. Pound, 1992). Consequently, large investors should be more likely to use their power to influence organizational decisions rather than sell their investments in the firm. This idea is supported by for example Hill and Snell (1989), who find empirical evidence for that powerful owners constrain managers' freedom to pursue certain strategies, suggesting that large investors actively monitor management. In contrast, various studies find evidence that large shareholders do not discipline management (e.g. Franks, Mayer & Renneboog, 2001). Franks, Mayer and Renneboog (2001) further argue some large shareholders such as insiders may even hinder the disciplining of management.

I acknowledge that different institutional investors may have conflicting interests with regards to CSR. However, if institutional shareholders in general actively monitor management to reduce inefficient expenditures and if the marginal investment in CSR is reducing firm value, then institutional ownership should be negatively related to the firm's CSR rating. This would indicate that institutional investors actively monitor the management with regards to CSR and that the marginal investment in CSR is reducing firm value. I hypothesize:

Hypothesis 4: *The relationship between institutional ownership and the firm's CSR rating is negative.*

Chapter 3 – Method

3.1 - Data sources

The data used in this study comes from various datasets available on WRDS. The various datasets are merged using identifier codes (*CUSIP* whenever possible, else *GVKEY*) in order to create a single dataset, which is then used to conduct the empirical analysis. Table 2 provides an overview of the variables used in this study and the source of these variables. In this study I take a cross-sectional approach (i.e. I use data from one-specific year for each variable). The main reason for doing so is that the number of strengths/concerns the firms have been scored on have changed over the years, which makes the comparison of CSR ratings across different years prone to errors. Furthermore, I focus only on data regarding public firms in the United States, as this prevents the possibility of omitting relevant country-specific variables which may lead to biased regression results.

3.2 - CSR rating & social pressure

The data on CSR comes from the MSCI ESG KLD STATS dataset. This dataset was initially created by KLD Research & Analytics, Inc. (KLD) in 1991. MSCI was acquired by KLD in 2010. The MSCI ESG KLD STATS is an annual dataset of positive and negative environmental, social and governance (ESG) performance indicators of publicly traded companies. The data ranges from the year 1991 to 2014. MSCI ESG KLD STATS provides scores on the following seven qualitative components of CSR; *environment*, *community*, *human rights*, *employee relations*, *diversity*, *product*, and *governance*. Environmental related issues include for example natural resource use and waste management, community related issues include community engagement and negative impact, human rights related issues include for example support for controversial regimes and human rights violations, employee relations related issues include for example employee health & safety programs and union relations, diversity related issues include for example gender diversity within the workforce, product related issues include for example product safety, and governance related issues include for example corruption and fraud.

The ESG performance indicators are scored using a binary model; if a firm meets the assessment criteria then the firm receives a score of "1". If the firm does not meet the assessment criteria then the firm receives a score of "0". Firms are scored on a number of

strengths and concerns within a component, meaning a score of "1" on a strength related issue is a positive indicator of the firm's CSR, while a score of "1" on a concern related issue is a negative indicator. Firms that have not been assessed with regards to a particular performance indicator receive a "NR" score. Lastly, the dataset also provides scores on concerns regarding controversial business. Controversial businesses activities include activities related to tobacco, alcohol, firearms, gambling, military and nuclear power. The firm receives a binary score on each individual controversial business activity, with a "1" indicating if the firm is involved in the particular controversial business, and a "0" otherwise. Involvement in controversial business activities in included as a control variable in the model.

In this study, the CSR rating of a firm for an individual component of CSR (such as "environment") is determined by adding up the number of strengths regarding the particular CSR component. The total CSR rating of the firm is the sum of strengths of all the individual CSR components combined. In a similar fashion, the concerns measure the degree of social pressure. The proxy I use to measure social pressure is a variable measuring the total number of concerns regarding social activities of the firm, which is similar to how Baron et al. (2011) measure social pressure. According to Baron et al. (2011), some concerns measure social pressure directly (such as the score on the concern *'Community Other Concern'* reflecting strong community opposition), whereas other concerns measure social pressure indirectly in the sense that these firm concerns harm the stakeholders which leads to opposition from these stakeholders or because activists identify such concerns and take action towards the firm (for example the score on the concern indicating production of ozone depleting chemicals). It is important to note that corporate governance strengths and concerns are ignored in this study, following Servaes & Tamayo (2013). The reason being is that in this study CSR is considered as the engagement in social objectives and stakeholders other than the shareholders. Corporate governance strengths and concerns in the MSCI ESG KLD STATS dataset mainly deal with shareholder/investor related issues.

The data on CSR ratings and social pressure is based on the years 2008 and 2009. The reason being these are the two most recent years prior to the introduction of the industry-based key issue ratings model, causing firms in different industries to be assessed on a different number of strengths/concerns related to CSR, making it more difficult to compare CSR ratings across industries. In the year 2008 and 2009, all firms in all industries were still

assessed on the same number of strengths and concerns. This year also contains only data with regards to U.S. public firms.

It is important to mention that in this study the CSR rating of the firm is used as a proxy for CSR expenditures, since the actual CSR expenditures of a firm are not observable. This implies that I assume higher CSR ratings reflect higher CSR expenditures and vice versa.

3.3 - Predictor variables of interest

In Table 1 below I have provided a summary of the expected relation (in a regression test) between the predictor variables of interest and the dependent variables CSR rating/Tobin's Q. The expected relationships are based on the hypotheses, as formulated in *Chapter 2*. For a description of all the variables included in the model, see Table 2.

Table 1 – Expected beta coefficient signs

The expected beta coefficient signs of the predictor variables when running a regression test, where CSR rating is the dependant variable. For an explanation of the variables, see *Table 2.*

Predictor variable	Hypothesis	Expected beta coefficient sign	Dependent variable
Executive ownership$_{2008}$	H1a	-	CSR rating$_{2009}$
Executive pay-for-performance$_{2008}$	H1b	-	CSR rating$_{2009}$
Executive ownership$_{2008}$	H2a	-	CSR rating$_{2009}$ condition: no social pressure
Executive pay-for-performance$_{2008}$	H2b	-	CSR rating$_{2009}$ condition: no social pressure
Social pressure$_{2008}$	H3a	+	CSR rating$_{2009}$
CSR rating$_{2008}$ * Social pressure$_{2008}$	H3b	-	Tobin's Q$_{2009}$
Institutional ownership$_{2008}$	H4	-	CSR rating$_{2009}$

The models where *CSR rating* is the dependent variable will be estimated using ordered probit regression models and the models where *Tobin's Q* is the dependent variable will be estimated using OLS regression models. The reason for using an ordered probit model is because the dependent variable CSR rating is discrete and limited which violates the assumptions of OLS in that the dependent variable is assumed to be continuous and thus

using OLS may lead to biased estimates.

It is important to mention that all independent predictor variables are lagged by one year. In other words, the predictor variables are from the year 2008, whereas the dependent variable is from the year 2009. The reason for doing so is to reduce potential simultaneity problems or reverse causality problems and the presence of these problems may lead to biased regression estimates.

3.4 - Control variables

I include a variety of variables to control for firm- and industry-specific effects. As for firm-specific effects, Tobin's Q is included as an independent variable (if not used as a dependent variable) to capture profitability of the firm. Return On Assets (ROA) is also included to control for the firm's profitability. I use ROA, because Waddock and Graves (1997) find that ROA has the strongest relation with CSR, compared to Return On Equity (ROE) and Return On Sales (ROS). Leverage is included to control for capital structure effects besides being an alternative proxy to indicate whether or not CSR is driven by agency problems, as higher leverage in theory pre-commits management more strongly to maximize shareholder value. I include firm age as a control variable, because previous research shows that firm age may be related to the firm's CSR activities (e.g. Cochran & Wood, 1984). The authors find that older firms have lower CSR ratings and argue this may be due to older firms having constructed plants in a period when there were fewer regulations and/or older firms may be less flexible in adapting to changes with regards to corporate social activities. Firm size is included as a control variable, because large firms are likely to spend more on CSR due to e.g. size of investments and visibility to outsiders. Firm risk is measured by the standard deviation of the returns and included in the model because various studies argue and find evidence that investors perceive socially irresponsible firms as being more risky (e.g. Frederick, 1995) and thus firm risk may affect the relation between CSR and ownership characteristics.

I use two different types of measures to capture industry-specific effects. The first measure mainly follows Baron et al. (2011), who divide their sample in consumer oriented firms (B2C) and business oriented firms (B2B) and also control for competitiveness of the industry, based on Fama & French 48 industry classifications. I include a dummy for whether

the firms operates in a business-to-consumer (B2C) or business-to-business (B2B) market. Firms in the following industries are classified as operating in a B2C market, similar to the classification of Baron et al. (2011): *food products, candy and soda, alcoholic beverages, tobacco products, recreational products, entertainment, printing and publishing, consumer goods, apparel, healthcare, miscellaneous, automobiles and trucks, telecommunications, personal services, computers, business supplies, retail, restaurants, hotels, motels, banking, insurance*. In a B2C industry, firms have individual consumers as their primary customers, whereas in a business-to-business (B2B) industry, firms have other firms as their primary customers. According to Lev et al. (2010), individual consumers are more sensitive to a firm's social activities, compared to industrial buyers whose purchasing decision-making process is strongly formalized and subject to cost/value analysis. Competitiveness of the firm is measured by the sales-based industry HHI. For my first measure I also include a third industry variable, which is based on Servaes & Tamayo (2013). This third industry variable is the median industry advertising intensity (=advertising expenses / sales), again based on the Fama & French 48 industry classifications. Servaes & Tamayo (2013) find a strong correlation between advertising and firm value and also find that advertising positively moderates the relationship between CSR and firm value. The second measure is similar to Kotchen & Moon (2012), who classify firms based on 4-digit SIC codes into various categories and include dummies for each (except one) category in regression analysis. Table 4 provides an overview of the industry classifications.

All independent variables are lagged by one year, same as the predictor variables of interest. The reason for doing so is that various studies find that financial performance influences future CSR activities (e.g. Waddock & Graves, 1997). This idea is based on slack-resources theory, which states that financially successful companies have more resources to spend on CSR and therefore spend more on CSR which results in higher CSR ratings. Lagging the variables also reduces potential simultaneity problems or reverse causality problems.

3.5 - Robustness tests

I take various measures to check for robustness of the results. First, as mentioned earlier, I lag the independent variables to reduce simultaneity and reverse causality problems. As for the OLS regressions I test the assumptions of the model. The results of the

assumption tests are provided in *Appendix B* and *Appendix C*. Furthermore, I estimate
multiple models for the same hypothesis, to check if the results hold under different
circumstances. I also use multiple variables that intend to measure the same construct for
some of the variables. More specifically, I measure managerial incentives using two
measures; one measure is *executive common stock ownership* and the second measure is
executive excess pay. Furthermore, I use two different types of controls for industry; the first
type consists of three separate industry variables, constructed based on Fama & French 48
industry classifications, and the second type consists of dummies based on the industry
classifications of Kotchen & Moon (2012), for which I have provided an overview in Table 4.

Table 2 – Variable descriptions

Variable	*Variable description*
Dependent variables:	
CSR rating	Sum of strengths across the following CSR components; environment, community, human rights, employee relations, diversity and product. *Source: MSCI ESG KLD STATS*
Tobin's Q	(shares outstanding * price per share + book value of debt) / book value of assets. *Source: CRSP/Compustat.*
Predictor variables of interest:	
Common stock – top 5 executives	Percentage of common stock ownership of the top 5 executives. Top 5 is based on highest compensation and always includes the CEO if the CEO did not leave before the end of 2009. *Source: Execucomp*
Excess pay – top 5 executives	Predicted residual when regressing top 5 executive compensation (log) on Tobin's Q, ROA and Total assets (log). *Source: Execucomp*
Social pressure	Sum of concerns across the following CSR components; environment, community, human rights, employee relations, diversity and product. *Source: MSCI ESG KLD STATS*
Common stock – institutions	Percentage of common stock ownership of the institutional block holders. *Source: Thomson Reuters*
Control variables:	
Leverage	(Short-term debt + long-term debt) / total assets. *Source: Compustat*
Firm size	Natural logarithm of the firm's total assets. *Source: Compustat*
Firm age	Natural logarithm of the firm's age in years. *Source: CRSP*

Firm risk	Average monthly standard deviation of the total return on the firm's shares, based on the past 60 months. *Source: CRSP*
ROA	Net income / total assets. *Source: CRSP*
Controversial business (dummy)	=1 if the firm is involved in one or more controversial business activities. *Source: MSCI ESG KLD STATS*
Industry effects (dummies)	Dummies based on the industry classifications presented in Table 4. *Source: Kotchen & Moon (2012)*
Industry – median advertising	Industry median of advertising expenses / sales. Industry is based on Fama & French 48 industry classifications. *Source: CRSP/Compustat*
Industry – B2C industry	=1 if the firm is in a business-to-consumer (B2C) industry. Industry is based on Fama & French 48 industry classifications. *Source: Baron et al. (2011)*
Industry – concentration	$\sum((\text{firm sales} / \text{mean industry sales})^2)$. Industry is based on Fama & French 48 industry classifications. *Source: CRSP/Compustat*

Chapter 4 – Empirical analysis

4.1 – Descriptive analysis and correlation analysis

Table 3 below provides a summary of the statistics of the variables included in one or more of the regression models. The financial variables are winsorized at the 1% level, except ROA is winsorized at the 5% level. This is done to control for extreme (and sometimes unrealistic) observations. Winsorizing the financial variables is consistent with other studies (e.g. Ferell, Liang & Renneboog, 2016; Servaes & Tamayo, 2013). When inspecting Table 3, there seem to be no unrealistic values for any of the variables. Note that *Total assets* and *Firm age* will be log transformed before including these variables in regression analysis, consistent with other studies. Also note that the number of observations on executive compensation and executive stock ownership are significantly less compared to the other variables, which is the main cause for the limited number of firms included in the regression analysis. The reason for this is that I excluded all firms with information on less than five executives. Furthermore, I excluded executives who left the company in the year 2007, 2008 or 2009, because these executives likely have significantly less or no influence on the firm's business activities anymore.

Table 3 – Summary of descriptive statistics

Variables	(1) N	(2) Mean	(3) SD	(4) Min	(5) Max
CSR rating$_{2009}$	2,120	1.179	1.963	0	21
CSR rating$_{2008}$	2,127	1.190	1.977	0	21
Social pressure$_{2009}$	2,120	1.561	1.747	0	15
Social pressure$_{2008}$	2,127	1.555	1.724	0	15
Compensation – top 5 executives$_{2009}$ (thousands $)	1,077	11,993	13,579	801	185,124
Common stock – top 5 executives$_{2008}$ (%)	1,084	3.42%	7.59%	0%	59.97%
Common stock – institutions$_{2008}$ (%)	2,250	68.16%	23.99%	0.55%	100%
Tobin's Q$_{2009}$ (winsorized at 1%)	2,157	1.338	1.052	0.112	5.759
Tobin's Q$_{2008}$ (winsorized at 1%)	2,242	1.155	0.955	0.122	5.826
Tobin's Q$_{2007}$ (winsorized at 1%)	2,198	1.719	1.528	0.148	10.503
ROA$_{2008}$ (winsorized at 5%)	2,250	-0.011	0.149	-0.460	0.165
ROA$_{2007}$ (winsorized at 5%)	2,208	0.027	0.113	-0.529	0.169
Total assets$_{2008}$ (millions $, winsorized at 1%)	2,250	6,145	18,415	29	146,248
Total assets$_{2007}$ (millions $, winsorized at 1%)	2,208	6,537	21,830	8	197,278
Leverage$_{2008}$ (winsorized at 1%)	2,242	0.235	0.224	0	0.991
Firm age$_{2008}$ (years)	2,119	18.602	16.920	0	83
Firm risk$_{2008}$ (%, winsorized at 1%)	2,246	12.36%	5.27%	4.21%	30.96%

Controversial business$_{2008}$ (dummy)	2,127	0.075	0.263	0	1
Industry – median advertising$_{2008}$	2,170	0.014	0.011	0.001	0.070
Industry – concentration$_{2008}$	2,250	0.069	0.052	0.020	0.731
Industry – B2C$_{2008}$ (dummy)	2,250	0.408	0.492	0	1

Note: Industry – median advertising$_{2008}$ and Industry – concentration$_{2008}$ are based on the full CRSP/Compustat merged sample and the three industry variables above are based on Fama & French 48-industry classifications, mainly based on Baron et al. (2011). Consumer industries are those industries classified as: food products, candy and soda, alcoholic beverages, tobacco products, recreational products, entertainment, printing and publishing, consumer goods, apparel, healthcare, miscellaneous, automobiles and trucks, telecommunications, personal services, computers, business supplies, retail, restaurants, hotels, motels, banking, insurance. The other industries are categorized as industrial. The corresponding SIC codes are given in Appendix A of Fama and French (1997). Firm risk$_{2008}$ is the firm's standard deviation based on the five year monthly total returns over the years 2004 – 2008.

Table 4 below provides an overview of CSR ratings and social pressure (CSR concerns) across industries, where the industry classifications are similar to Kotchen & Moon (2012). Column (3) shows the average *CSR rating$_{2009}$* for firms in each industry and indicates that CSR ratings vary significantly across industries. Column (4) shows the *Social pressure$_{2008}$* for firms in each industry and indicates that social pressure varies significantly across industries as well.

Table 4 – Industry classifications

Industry	(1) SIC	(2) # of companies	(3) CSR rating$_{2009}$	(4) Social pressure$_{2008}$
Mining & Construction	0100 - 1799	133	1.08	3.17
Food, textiles, apparel	2000 – 2399	65	1.86	2.82
Paper & publishing	2400 – 2799	63	2.39	2.10
Chemicals & Pharmaceuticals	2800 – 2899	187	1.58	2.22
Refining, rubber, plastic	2900 – 3199	37	2.35	3.44
Heavy manufacturing	3200 – 3569	132	1.12	2.40
Computers & precision products	3570 – 3699	187	1.49	1.69
Auto & aerospace	3700 – 3799	50	1.67	3.02
Transportation services	4000 – 4789	56	1.31	2.30
Telephone & Utilities	4800 – 4991	144	1.81	3.04
Wholesale & retail	5000 – 5999	202	1.43	2.34
Bank & financial services	6000 – 6799	487	1.19	1.19
Hotel & entertainment	7000 – 7999	275	1.22	1.51
Hospital management	8000 – 8999	97	0.74	1.62
Other	All other SIC	135	1.30	1.81

Note: Industry classifications are similar to Kotchen & Moon (2012). In regression analysis I mainly use these industry classifications (as separate dummies) to control for industry effects. See also Table 2 and Table 3 for alternative industry controls I use in regression analysis, which are based on Fama & French 48 industry classifications.

Table 5 below provides the results of a correlation analysis of the key variables of this study. Overall, the variables have the expected signs and significance with regards to correlation with other variables, suggesting that the variables are good measures for what they intend to measure. I will now discuss the results of the correlation analysis.

Table 5 – Correlation analysis of key variables

Variables	CSR rating	Social pressure	Common stock top 5 executives	Common stock institutions	Excess pay top 5 executives	Tobin's Q
CSR rating	1					
Social pressure	0.39**	1				
Common stock – top 5 executives	-0.14**	-0.06**	1			
Common stock – institutions	0.06**	0.06**	-0.25**	1		
Excess pay – top 5 executives	-0.01	0.02	-0.04	0.27**	1	
Tobin's Q	-0.005	-0.05**	0.07**	0.05**	0.04	1

Note: ** indicates significance at the 5% level. CSR rating and Tobin's Q are based on 2009 data, the other variables are based on 2008 data. Excess pay – top 5 executives is the predicted residual of the 1st stage regression in Table 7a.

The negative correlation between executive stock ownership and CSR rating suggests that firms have lower CSR ratings when ownership by executives is high. The positive correlation between executive stock ownership and Tobin's Q suggests that firms with higher executive ownership are more profitable, consistent with agency theory predicting that managers have more incentives to maximize firm value as their ownership in the firm increases. These correlations are consistent with hypothesis 1a/2a, which predict a negative relationship between executive ownership and CSR ratings.

The positive relation between executive excess pay and CSR rating suggests that firms where the top executives their pay is less linked to firm performance have higher CSR ratings, consistent with hypothesis 1b/2b. It is important to note that excess pay measures the same as pay-for-performance, but the expected sign in a regression analysis is the opposite. In other words, a negative correlation between the pay-for-performance ratio and CSR rating is similar to a positive correlation between excess pay and CSR rating. This approach to measuring the relation between managerial incentives through compensation and CSR rating is based on other studies (e.g. Ferell, Liang & Renneboog, 2016). There is no correlation between executive excess pay and Tobin's Q (at the 5% level), suggesting that executive pay-for-performance is not linked to firm performance or that my measure of pay-for-performance is not adequate. An alternative explanation is that the relationship between pay-for-performance and Tobin's Q is not captured well via a correlation analysis. For

example, more profitable firms are likely to pay their executives a higher compensation which may lead to a higher excess pay in dollar amounts as well. Regression analysis later on, which controls for such effects, will provide a more reliable answer.

The positive correlation between social pressure and CSR rating suggests that firms who face higher social pressure have a higher CSR rating, which is consistent with hypothesis 3a. The negative correlation between social pressure and Tobin's Q suggests that firms who face high social pressure are less profitable, which is the expected sign and significance from a variable that intends to measure social pressure in the sense that social pressure harms the reputation of a firm which is costly for the firm.

I find no significant correlation (at the 5% level) between CSR rating and Tobin's Q. The correlation is insignificant even at the 10% level (not reported). This suggests that firms with higher/lower CSR ratings are not more profitable.

Lastly, the positive correlation between institutional stock ownership and CSR rating suggests that firms with high institutional ownership have higher CSR ratings. The positive correlation between institutional stock ownership and Tobin's Q suggests that firms with higher institutional ownership are more profitable, consistent with that institutional investors (or large investors) actively monitor the firm's executives and reduce inefficient business activities.

4.2 – Evaluation of the relation between managerial ownership and CSR

In Table 6a and Table 6b in *Appendix A* are presented the ordered probit regression results with regards to top executive stock ownership and the firm's CSR rating. The difference between Table 6a and Table 6b lies in the use of different industry controls. In Table 6a I control for industry based on advertising intensity, competitiveness and whether or not the firm operates in a business-to-consumer industry, based on Baron et al. (2011) and Servaes & Tamayo (2013). In Table 6b I control for industry using dummies based on the industry classifications as presented in Table 4 above. Note that controlling for industry using industry dummies seems to capture more of the variability in the dependent variable CSR rating, as indicated by the higher pseudo-R^2. This suggests that industry advertising intensity, industry competitiveness and the B2C indicator do not capture all of the variation in CSR across industries, or the construction of these variables in this study is suboptimal.

Furthermore, note that the regressions in column (2) and column (3) are done on a subset of firms. Column (2) contains the subset of firms where top 5 executive ownership is equal to or less than 5% and column (3) contains the subset of firms where top 5 executive ownership is equal to or less than 25%. As indicated by the total number of observations, almost all firms are already represented in the subset of firms where top 5 executive ownership is equal to or less than 25%. These divisions seem rather arbitrarily chosen, however, they are not. These divisions are based on Morck, Schleifer & Vishny (1988) who find, as discussed earlier in *chapter 2*, that an increase in managerial stock ownership increases firm value up until 5% stock ownership, decreases firm value between 5% and 25% stock ownership and increases firm value again beyond 25% stock ownership. In other words, according to this study the incentive effect of managerial ownership is different at different intervals of managerial ownership, which I account for in this study. I do not have not enough observations where top 5 executive ownership is between 5 – 25% (120 observations) and >25% (31 observations) to predict relationships with enough statistical power on these subsamples, hence I only the focus on the 5% and 25% cut off value to split up the samples.

For the overall sample, *common stock ownership – top 5 executives* is not significantly related to *CSR rating* (see column (1) of Table 6a/6b). However, when I limit the sample to firms with top executive ownership equal to or less than 5% or 25%, I find a significant negative relation between executive stock ownership and the CSR rating (see column (2) and column (3) of Table 6a/6b). One possible explanation for this observation is extreme observations. Another possibility is that firms with high executive ownership simply do not engage in inefficient CSR activities due to the effectiveness of ownership as an incentive mechanism. Overall, the significant and negative coefficients of *Common stock – top 5 executives* are consistent with hypothesis 1a and indicates that, all else equal, top executives reduce CSR expenditures as they bear more of the costs of inefficient CSR expenditures, which implies that the marginal investment in CSR is reducing firm value. Since I find evidence for that managers engage in inefficient CSR activities and reduce inefficient CSR expenditures as their ownership in the firm increases. Therefore, I do not reject hypothesis 1a.

4.3 - Evaluation of the relation between managerial pay-for-performance and CSR

In Table 7a and Table 7b in *Appendix A* are presented the OLS regression results (1st stage) and ordered probit regression results (2nd stage), with regards to executive pay-for-performance. The difference between Table 7a and Table 7b lies in the use of different industry controls, similar to the difference between Table 6a and Table 6b. The testable assumptions of the OLS regressions (1st stage) are tested and discussed in *Appendix B.*

As for the empirical strategy, I follow other studies (e.g. Ferrell, Liang & Renneboog, 2016) in first estimating excess pay by predicting the residual of a top executive compensation regression model with the explanatory variables being firm performance indicators and industry controls, and then in the 2nd stage this residual is being used as an explanatory variable of a regression model where the dependent variable is the firm's CSR rating.

The coefficient of excess pay is positive but statistically insignificant in Table 7a and is weakly positive significant (at the 10% level) in Table 7b. The weakly positive significant coefficient of Excess pay in Table 7b indicates that, all else equal, top executives increase CSR expenditures as their compensation suffers less from inefficient CSR expenditures or similarly, all else equal, top executives reduce CSR expenditures as their compensation suffers more from inefficient CSR expenditures. This finding implies that the marginal investment in CSR is reducing firm value which is consistent with hypothesis 1b, although the evidence is not strong. Overall, I find (weak) evidence for that managers engage in inefficient CSR activities and reduce inefficient CSR expenditures as their pay is more strongly based on performance. Therefore, I do not reject hypothesis 1b.

4.4 - Evaluation of the profitability of CSR in the absence of social pressure

In Table 8 and 9 in *Appendix A* are presented again the regressions with regards to the relationship between executive ownership and executive pay-for-performance, respectively. The regressions are generally similar to those in Table 6b and Table 7b (in which I used industry dummies to control for industry effects), except these tables also include an interaction variable between social pressure and executive ownership (Table 8) and between social pressure and executive excess pay (Table 9). I provide only results where I control for industry using dummies, since a comparison of Table 6a with Table 6b and a

comparison of Table 7a with Table 7b indicates that using dummies to control for industry seems to capture industry effects better, as indicated by the higher pseudo R^2.

First, note that in all regression models where the dependent variable is CSR rating the coefficient of social pressure is significant and positive, indicating that firms under higher social pressure have higher CSR ratings, which is consistent with hypothesis 3 in that firms respond to social pressure by increasing CSR expenditures. Furthermore, as one can observe from Table 8 when observing column (1), column (2) and column (3), the interaction effect between social pressure and top executive ownership is negative and significant, while the top executive ownership variable is not statistically significant. This indicates that, all else equal, top executives of firms under social pressure reduce CSR expenditures as they bear more of the costs of inefficient CSR expenditures and the probability of reducing CSR expenditures is higher the greater the social pressure. When the firm faces zero social pressure, there is no significant relation between top executive ownership and the firm's CSR rating, because the coefficient of the variable *Common stock – top 5 executives* is insignificant on its own. These findings suggest that managers only engage in inefficient CSR expenditures as a response to social pressure, for example to protect their own reputation as discussed in *Chapter 2*, and do not engage in inefficient CSR expenditures because they like to give, for example because they have a fairness motivation or receive warm-glow from giving. However, there exists the possibility that *Common stock – top 5 executives* on its own is insignificant due to the high correlation with the interaction term. A correlation analysis shows that the interaction term and *Common stock – top 5 executives* indeed are highly correlated (correlation of 0.73, significant at the 1% level). Therefore it is not possible to draw any reliable conclusion from column (1), column (2) and column (3) of Table 8 on whether or not managers engage in inefficient CSR activities for reasons other than as a response to social pressure (which would be indicated by the variable *Common stock – top 5 executives* conditional on that social pressure is zero). Thus, I run another regression on a subset of the firms that did not face any social pressure at December 2008 or December 2009 according to the MSCI concerns data. This explains why there are only 210 observations for this particular regression. The results are presented in column (4) of Table 8. The coefficient of *Common stock – top 5 executives* in column (4) of Table 8 indicates that, all else equal, top executives of firms that did not face social pressure reduce CSR expenditures as they bear more of the costs of inefficient CSR expenditures. The finding

suggests that top executives engage in inefficient CSR expenditures for reasons other than as a response to social pressures from stakeholders other than shareholders, consistent with hypothesis 2a and the theory that managers like to give because they have, for example, a fairness motivation or receive warm-glow from giving.

The findings in Table 8 are consistent with the positive significant coefficient of *Excess pay – top 5 executives* and the insignificant coefficient of the interaction term in Table 9. The coefficient indicates that, all else equal, top executives increase CSR expenditures as their compensation suffers less from inefficient CSR expenditures, regardless of whether or not the firm faces social pressure. In other words, top executives reduce CSR expenditures as their compensation suffers more from inefficient CSR expenditures, regardless of whether or not the firm faces social pressure. One may argue that the significant coefficient of *Excess pay – top 5 executives* in Table 9 is significant, because of the high correlation with the interaction term (correlation of 0.65, significant at the 1% level). Thus, I re-run the model using demeaned variables of the variables that make up the interaction variable. The results are provided in column (3) of Table 9. The correlation between *Excess pay – top 5 executives* and the interaction term is now reduced to 0.04 and not significant at the 10% level, while the coefficient of *Excess pay – top 5 executives* remains positively significant. Overall, the results indicate that managers engage in inefficient CSR activities for reasons other than as a response to social pressure, consistent with the theory stating that top executives engage in inefficient CSR activities because they like to give. Therefore, I do not reject hypothesis 2a and hypothesis 2b.

4.5 - Evaluation of the profitability of CSR and the role of social pressure

First, note that *social pressure* is positively significant in all columns throughout Table 6, Table 7, Table 8 and Table 9. This strongly suggests that firms respond to social pressure by increasing CSR activities, consistent with hypothesis 3a. Also note that the interaction variable *Executive ownership * social pressure* in Table 8 is negatively significant, which indicates that top executives of firms under social pressure reduce CSR expenditures as they bear more of the costs of inefficient CSR expenditures and do so more strongly the greater the social pressure. This finding is consistent with the theory stating that managers engage in inefficient CSR expenditures as a response to social pressure, for example to protect their

own reputation as discussed in *Chapter 2.*

In Table 10 in *Appendix A* are presented OLS regressions with regards to the relation between CSR rating, social pressure and Tobin's Q. Note that the Fama & French 48 industry classifications is used to capture industry effects. Similar results hold when using the 15 industry classifications as reported in Table 4, but the results are not reported for space reasons. The assumptions with regards to the full model in column (2) are discussed in *Appendix C.* I also tested the assumptions for the models in column (1) and column (3) and the results are fairly similar, which is why I have not reported the results of the testing procedure for these two models.

The important column in Table 10 is column (2), which represents the full regression model, with an alternative specification of the model presented in column (3) which yields similar results and is for that reason not discussed further. As one can observe from Table 10, the coefficients of *Social pressure* are statistically insignificant and the coefficient of *CSR rating * social pressure* is negatively significant. According to Baron et al. (2011), social pressure could directly affect market value by driving some investors away from the firm or could affect profits by harming brand equity or firm reputation. The findings suggest that social pressure harms firm value only through reducing the effectiveness of the CSR rating, for example by harming the firm's reputation/credibility regarding social involvement, and does not directly harm firm value, for example by driving investors away. Another possibility consistent with the findings is that social pressure affects firm value by reducing the effectiveness of CSR investments. As discussed in the *Chapter 2*, inefficient managers may commit to socially responsible behaviour to gain stakeholder support, at the expense of shareholders. Note that *social pressure* is positively significant in all columns throughout Table 6, Table 7, Table 8 and Table 9 and that the interaction variable *Executive ownership * social pressure* in Table 8 is negatively significant, which indicates that top executives of firms respond to social pressure by increasing CSR expenditures and under social pressure more strongly reduce inefficient CSR expenditures when they bear more of the costs of inefficient CSR expenditures. A similar interpretation is that, all else equal, when the executive is better incentivized he/she reduces CSR expenditures less strongly when facing lower social pressure, which strongly suggests that inefficient CSR investments are at least partially driven by social pressure. Overall, I find evidence for that firms respond to social pressure by increasing CSR expenditures, that social pressure negatively moderates the

relation between CSR and firm value, and find evidence consistent with that firms engage in inefficient CSR due to social pressure. These findings are consistent with hypothesis 3a/3b and the theory stating that inefficient managers may commit to socially responsible behaviour to gain stakeholder support, at the expense of shareholders. Therefore I do not reject hypothesis 3a and hypothesis 3b.

4.6 - Evaluation of the relation between institutional ownership and CSR

First, as one can observe the coefficient of *Common stock – institutions* in column (3) of Table 10 is positive and significant. This indicates that, all else equal, a marginal increase in institutional ownership as a percentage of the total common shares outstanding increases firm value (as measured by Tobin's Q), consistent with that institutional shareholders actively monitor management and reduce inefficient expenditures.

As one can observe from the regression models in Table 6b, Table 7b, Table 8 and Table 9 in *Appendix A*; the coefficient of *Common stock – institutions* is significant and negative. This suggests, all else equal, institutional shareholders actively monitor CSR activities and reduce CSR expenditures as they bear more of the costs of inefficient CSR expenditures. This finding reconfirms that the marginal investment in CSR is reducing firm value (under the assumption that institutional shareholders actively monitor to reduce inefficient expenditures).

I find no significant relation between institutional ownership and CSR rating based on the regression models in Table 6a and Table 7a. One explanation for this is that the industry advertising intensity, industry competitiveness and B2C industry indicator variables do not adequately control for industry effects regarding CSR, which are the industry controls in Table 6a and Table 7a and these two tables are the only tables presenting regression models where institutional ownership has no significant effect on the CSR rating. As a result, the relationship between institutional ownership and CSR rating may be biased. The institutional ownership variable is not correlated with the industry dummies (at the 10% level or higher, not reported) in the other tables where institutional ownership is significantly related to CSR rating, which implies that the significant negative relationship between institutional ownership and CSR rating is not driven by spurious correlation. Overall, I find evidence for

that institutional shareholders actively monitor and reduce CSR expenditures as they bear more of the costs of inefficient expenditures. Therefore I do not reject hypothesis 4.

Chapter 5 – Conclusion

In this cross-sectional study I examined whether or not top executives engage in inefficient CSR activities and further investigate two possible motives for doing so, with the first motive being that managers do not like to give but give as a response to social pressure (e.g. Dellavigna, List & Malmendier, 2012) and the second motive being that managers like to give, due to for example warm-glow (Andreoni 1989, 1990) and/or a fairness motivation (e.g. Fehr & Schmidt, 1999). Using an empirical strategy based on managerial incentives, I find evidence indicating that when top executives are better incentivized they reduce CSR expenditures, implying the marginal investment in CSR reduces firm value. The findings also show that firms respond to social pressure by increasing CSR expenditures (consistent with Baron et al., 2011) and social pressure negatively moderates the positive relation between CSR and firm value. Furthermore, when top executives are better incentivized and consequently reduce CSR expenditures, they reduce CSR expenditures more strongly the greater the social pressure. These findings are consistent with the theory that managers may commit to socially responsible behaviour to gain stakeholder support, at the expense of shareholders. However, the results suggest executives do not only invest in inefficient CSR as a response to social pressure. The results show that also in the absence of social pressure top executives reduce CSR expenditures as they are better incentivized, consistent with (but no direct evidence of) that managers invest in inefficient CSR activities because they like to give. The findings are consistent with Dellavigna, List and Malmendier (2012), who theorize and find evidence that individuals donate to charity because of social pressure but also because they like to give. Furthermore, I investigated the role of institutional shareholders with regards to CSR activities and find evidence that institutional shareholders reduce CSR expenditures as their holdings of common stock in the firm increases, reinforcing the finding that the marginal investment in CSR is reducing firm value and the finding is consistent with the theory that institutional shareholders actively monitor and reduce inefficient (CSR) expenditures.

This study contributes to the existing literature in that it is, as far as I am aware, the first study that uses an empirical strategy based on managerial incentives to investigate possible motives for why managers invest in inefficient CSR activities. Previous studies on the relation between CSR and financial performance were limited in that they mainly

focused on whether or not CSR contributes to or decreases firm value (e.g. Flammer, 2015; Servaes & Tamayo, 2013, Cheng, Hong & Shue, 2014; Ferell, Liang & Renneboog, 2016), while it is important to also understand the motives that drive inefficient CSR investments, as also mentioned by Cheng, Hong and Shue (2014). However, more research should be done on the motives that drive inefficient CSR expenditures by management, in order to draw more reliable conclusions.

Unfortunately, this study is not without limitations. First, this study only investigates the marginal effect of CSR on firm value. Not all CSR activities may be firm value reducing, however, the marginal investment in CSR is reducing firm value. Second, interpreting economic significance for various variables with regards to CSR and firm value is limited as CSR expenditures are not directly observable, but proxied for through social ratings. Further research should focus on developing better measures for CSR expenditures in order to be better able to examine economic implications of CSR related activities. Third, there may be causality problems present as there exists the possibility that the current CSR rating is the result of investment decisions made many years ago. Hence, using only lagged independent variables may not be adequate in dealing with possible causality problems, because the CSR rating may already be established prior to the period in which the independent variables are observed.

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Appendix A – Regression outputs

Table 6a

The table shows the results from ordered probit regressions where the dependent variable is the firm's CSR rating, which is measured by the firm's total number of strengths regarding *environment*, *community*, *human rights*, *employee relations*, *diversity* and *product*. Column (1) represents the regression results for all observations in the sample, column (2) represents the regression results for firms where common stock ownership of the top 5 executives <= 5% and column (3) represents the regression results for firms where common stock ownership of the top 5 executives <= 25%. The dependent variable is based on December 2009 data and all independent variables are based on (fiscal year) 2008. The industry variables are based on the Fama & French 48 industry classifications.

Variable	(1) CSR rating	(2) CSR rating	(3) CSR rating
Common stock – top 5 executives (%)	-0.006	-0.155***	-0.028***
	(0.005)	(0.040)	(0.010)
Social pressure	0.083***	0.091***	0.083***
	(0.021)	(0.022)	(0.021)
Common stock – institutions (%)	-0.002	-0.001	-0.002
	(0.002)	(0.002)	(0.002)
Tobin's Q (winsorized at 1%)	0.210***	0.235***	0.217***
	(0.044)	(0.047)	(0.044)
ROA (winsorized at 5%)	-0.449	-0.471	-0.424
	(0.334)	(0.362)	(0.341)
Total assets (log, winsorized at 1%)	0.351***	0.346***	0.344***
	(0.030)	(0.033)	(0.031)
Leverage (winsorized at 1%)	-0.582***	-0.390*	-0.544***
	(0.188)	(0.203)	(0.191)
Firm age (log)	0.182***	0.204***	0.194***
	(0.046)	(0.049)	(0.047)
Firm risk (%, winsorized at 1%)	0.015	0.017	0.014
	(0.010)	(0.011)	(0.010)
Controversial business (dummy)	-0.117	-0.208	-0.100
	(0.132)	(0.146)	(0.134)
Industry – median advertising	7.384**	4.340	7.289**
	(3.558)	(4.021)	(3.666)
Industry – concentration	0.254	-0.309	0.176
	(0.657)	(0.728)	(0.669)
Industry – B2C (dummy)	-0.028	-0.020	-0.039
	(0.083)	(0.090)	(0.084)
Number of observations	986	835	955
R^2 (McKelvey & Zavoina)	0.298	0.337	0.310
Chi-square	306.86***	304.13***	311.40***

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10

Table 6b

The table shows the results from ordered probit regressions where the dependent variable is the firm's CSR rating, which is measured by the firm's total number of strengths regarding *environment*, *community*, *human rights*, *employee relations*, *diversity* and *product*. Column (1) represents the regression results for all observations in the sample, column (2) represents the regression results for firms where common stock ownership of the top 5 executives <= 5% and column (3) represents the regression results for firms where common stock ownership of the top 5 executives <= 25%. The dependent variable is based on December 2009 data and all independent variables are based on (fiscal year) 2008. Industry effects are dummies based on the 15 classifications presented in Table 4.

Variable	(1) CSR rating	(2) CSR rating	(3) CSR rating
Common stock – top 5 executives (%)	-0.005	-0.113***	-0.023**
	(0.005)	(0.041)	(0.010)
Social pressure	0.040*	0.057**	0.042*
	(0.022)	(0.023)	(0.022)
Common stock – institutions (%)	-0.005**	-0.004*	-0.005**
	(0.002)	(0.002)	(0.002)
Tobin's Q (winsorized at 1%)	0.184***	0.198***	0.193***
	(0.044)	(0.048)	(0.045)
ROA (winsorized at 5%)	-0.557*	-0.550	-0.513
	(0.336)	(0.365)	(0.342)
Total assets (log, winsorized at 1%)	0.481***	0.466***	0.471***
	(0.033)	(0.036)	(0.034)
Leverage (winsorized at 1%)	-0.615***	-0.457**	-0.588***
	(0.193)	(0.208)	(0.196)
Firm age (log)	0.122***	0.140***	0.129***
	(0.046)	(0.050)	(0.047)
Firm risk (%, winsorized at 1%)	0.012	0.014	0.011
	(0.010)	(0.011)	(0.011)
Controversial business (dummy)	-0.126	-0.200	-0.118
	(0.122)	(0.132)	(0.123)
Industry effects (dummies)	YES	YES	YES
Number of observations	1,043	891	1,012
R^2 (McKelvey & Zavoina)	0.377	0.400	0.384
Chi-square	429.75***	401.51***	428.89***

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10

Table 7a

The table shows the results from OLS regression with robust standard errors (1st stage) and ordered probit regression (2nd stage) where the dependent variable in the 1st stage is the natural logarithm of the total compensation of the top 5 executives and the dependent variable in the 2nd stage is the firm's CSR rating, which is measured by the firm's total number of strengths regarding *environment*, *community*, *human rights*, *employee relations*, *diversity* and *product*. The dependent variable CSR rating is based on 2009 data, the independent variables in the 1st stage are based on (fiscal year) 2007 data and all other variables are based on (fiscal year) 2008 data. The advertising, concentration and B2C industry variables are based on the Fama & French 48 industry classifications and the industry effects are dummies based on the 15 classifications presented in Table 4.

Variable	1st stage Compensation – top 5 executives (log)	2nd stage CSR rating
Excess pay – top 5 executives (predicted residual from 1st stage)		0.098 (0.068)
Social pressure		0.091*** (0.021)
Common stock – institutions (%)		-0.002 (0.002)
Tobin's Q (winsorized at 1%)	0.160*** (0.020)	0.213*** (0.044)
ROA (winsorized at 5%)	0.406 (0.345)	-0.517 (0.342)
Total assets (log, winsorized at 1%)	0.423*** (0.012)	0.351*** (0.030)
Leverage (winsorized at 1%)		-0.574*** (0.189)
Firm age (log)		0.175*** (0.049)
Firm risk (%, winsorized at 1%)		0.012 (0.011)
Controversial business (dummy)		-0.108 (0.134)
Industry – median advertising		6.503* (3.586)
Industry – concentration		0.288 (0.671)
Industry – B2C (dummy)		-0.006 (0.084)
Constant	5.605*** (0.129)	
Industry effects (dummies)	YES	NO
Number of observations	1056	965
R^2	0.563	0.299
F-Test / Chi-square	83.26***	301.58***

*Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10*

Table 7b

The table shows the results from OLS regression with robust standard errors (1st stage) and ordered probit regression (2nd stage) where the dependent variable in the 1st stage is the natural logarithm of the total compensation of the top 5 executives and the dependent variable in the 2nd stage is the firm's CSR rating, which is measured by the firm's total number of strengths regarding *environment*, *community*, *human rights*, *employee relations*, *diversity* and *product*. The dependent variable CSR rating is based on 2009 data, the independent variables in the 1st stage are based on (fiscal year) 2007 data and all other variables are based on (fiscal year) 2008 data. The advertising, concentration and B2C industry variables are based on the Fama & French 48 industry classifications and the industry effects are dummies based on the 15 classifications presented in Table 4.

Variable	1st stage Compensation – top 5 executives (log)	2nd stage CSR rating
Excess pay – top 5 executives (predicted residual from 1st stage)		0.116* (0.068)
Social pressure		0.043* (0.022)
Common stock – institutions (%)		-0.006** (0.002)
Tobin's Q (winsorized at 1%)	0.160*** (0.020)	0.183*** (0.045)
ROA (winsorized at 5%)	0.406 (0.345)	-0.630* (0.343)
Total assets (log, winsorized at 1%)	0.423*** (0.012)	0.490*** (0.034)
Leverage (winsorized at 1%)		-0.629*** (0.194)
Firm age (log)		0.105** (0.049)
Firm risk (%, winsorized at 1%)		0.009 (0.011)
Controversial business (dummy)		-0.124 (0.123)
Constant	5.605*** (0.129)	
Industry effects (dummies)	YES	YES
Number of observations	1056	1022
R^2	0.563	0.380
F-Test / Chi-square	83.26***	426***

*Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$*

Table 8

The table shows the results from ordered probit regressions where the dependent variable is the firm's CSR rating, which is measured by the firm's total number of strengths regarding *environment*, *com- munity*, *human rights*, *employee relations*, *diversity* and *product*. Column (1) represents the regression results for all observations in the sample, column (2) represents the regression results for firms where common stock ownership of the top 5 executives <= 5%, column (3) represents the regression results for firms where common stock ownership of the top 5 executives <= 25% and column (4) represents the regression results for firms where common stock ownership of the top 5 executives <= 5% and who faced no social pressure as of December 2008 and December 2009. The dependent variable is based on December 2009 data and all independent variables are based on (fiscal year) 2008. Industry effects are dummies based on the 15 classifications presented in Table 4.

Variable	(1) CSR rating	(2) CSR rating	(3) CSR rating	(4) CSR rating
Common stock – top 5 executives (%)	0.010	0.019	-0.001	-0.201**
	(0.007)	(0.055)	(0.013)	(0.097)
Social pressure	0.057**	0.100***	0.060***	
	(0.022)	(0.026)	(0.023)	
Executive ownership * social pressure	-0.009***	-0.087***	-0.013**	
	(0.003)	(0.025)	(0.005)	
Common stock – institutions (%)	-0.005**	-0.004	-0.005**	0.003
	(0.002)	(0.002)	(0.002)	(0.005)
Tobin's Q (winsorized at 1%)	0.177***	0.204***	0.190***	0.081
	(0.044)	(0.048)	(0.045)	(0.103)
ROA (winsorized at 5%)	-0.548	-0.658*	-0.550	0.148
	(0.336)	(0.365)	(0.343)	(0.748)
Total assets (log, winsorized at 1%)	0.480***	0.473***	0.473***	0.150*
	(0.033)	(0.036)	(0.034)	(0.086)
Leverage (winsorized at 1%)	-0.599***	-0.488**	-0.603***	-0.436
	(0.193)	(0.208)	(0.196)	(0.411)
Firm age (log)	0.122***	0.131***	0.130***	-0.050
	(0.046)	(0.050)	(0.047)	(0.104)
Firm risk (%, winsorized at 1%)	0.012	0.012	0.011	0.024
	(0.010)	(0.011)	(0.011)	(0.022)
Controversial business (dummy)	-0.123	-0.213	-0.109	0.564
	(0.122)	(0.132)	(0.123)	(0.460)
Industry effects (dummies)	YES	YES	YES	YES
Number of observations	1,043	891	1,012	210
R² (McKelvey & Zavoina)	0.383	0.409	0.389	0.237
Chi-square	438.29***	413.90***	435.35***	33.92*

*Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10*

Table 9

The table shows the results from OLS regression with robust standard errors (1st stage) and ordered probit regression (2nd stage) where the dependent variable in the 1st stage is the natural logarithm of the total compensation of the top 5 executives and the dependent variable in the 2nd stage is the firm's CSR rating, which is measured by the firm's total number of strengths regarding *environment*, *community*, *human rights*, *employee relations*, *diversity* and *product*. The difference between column (2) and column (3) is that in column (3) I demeaned the variables that make up the interaction variable. The dependent variable CSR rating is based on 2009 data, the independent variables in the 1st stage are based on (fiscal year) 2007 data and all other variables are based on (fiscal year) 2008 data. Industry effects are dummies based on the 15 classifications presented in Table 4.

Variable	(1) 1st stage Compensation – top 5 executives (log)	(2) 2nd stage CSR rating	(3) 2nd stage CSR rating
Excess pay – top 5 executives (predicted residual from 1st stage)		0.184** (0.089)	0.125* (0.068)
Social pressure		0.042* (0.022)	0.042* (0.022)
Executive excess pay * social pressure		-0.038 (0.033)	-0.038 (0.033)
Common stock – institutions (%)		-0.006*** (0.002)	-0.006*** (0.002)
Tobin's Q (winsorized at 1%)	0.160*** (0.020)	0.183*** (0.045)	0.183*** (0.045)
ROA (winsorized at 5%)	0.406 (0.345)	-0.622* (0.343)	-0.622* (0.343)
Total assets (log, winsorized at 1%)	0.423*** (0.012)	0.490*** (0.034)	0.490*** (0.034)
Leverage (winsorized at 1%)		-0.631*** (0.194)	-0.631*** (0.194)
Firm age (log)		0.106** (0.049)	0.106** (0.049)
Firm risk (%, winsorized at 1%)		0.009 (0.011)	0.009 (0.011)
Controversial business (dummy)		-0.119 (0.123)	-0.119 (0.123)
Constant	5.605*** (0.129)		
Industry effects (dummies)	YES	YES	YES
Number of observations	1056	1022	1022
R^2	0.563	0.381	0.381
F-Test / Chi-square	83.26***	427.35***	427.35***

*Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10*

Table 10

The table shows the results from OLS regressions with robust standard errors where the dependent variable is the firm's Tobin's Q, which is winsorized at 1% and measured by the following formula: *(market value of equity + book value of debt) / book value of assets).* The variable CSR rating (Social pressure) is measured by the firm's total number of strengths (concerns) regarding *environment*, *community*, *human rights*, *employee relations*, *diversity* and *product*. The dependent variable is based on (fiscal year) 2009 data and the independent variables are based on (fiscal year) 2008 data. Industry effects are dummies based on the Fama & French 48 industry classifications.

Variable	(1) Tobin's Q	(2) Tobin's Q	(3) Tobin's Q
CSR rating	0.062***	0.088***	
	(0.011)	(0.015)	
Social pressure	-0.013	0.012	
	(0.012)	(0.015)	
CSR rating * social pressure		-0.008***	
		(0.002)	
CSR rating - social pressure			0.042***
			(0.009)
Common stock – institutions (%)	-0.018***	-0.018***	-0.018***
	(0.006)	(0.006)	(0.006)
Common stock – institutions (%, squared)	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
ROA (winsorized at 5%)	0.966***	0.977***	0.967***
	(0.185)	(0.185)	(0.186)
Total assets (log, winsorized at 1%)	-1.199***	-1.234***	-1.267***
	(0.125)	(0.126)	(0.123)
Total assets (log, squared, winsorized at 1%)	0.065***	0.067***	0.071***
	(0.008)	(0.008)	(0.007)
Leverage (winsorized at 1%)	0.351***	0.361***	0.347***
	(0.129)	(0.129)	(0.130)
Firm age (log)	-0.081***	-0.080***	-0.077***
	(0.024)	(0.024)	(0.024)
Firm risk (%, winsorized at 1%)	-0.010*	-0.011*	-0.011*
	(0.006)	(0.006)	(0.006)
Controversial business (dummy)	-0.063	-0.062	-0.053
	(0.059)	(0.059)	(0.059)
Constant	7.165***	7.257***	7.476***
	(0.617)	(0.628)	(0.617)
Industry effects (dummies)	YES	YES	YES
Number of observations	2,025	2,025	2,025
Adjusted R^2	0.379	0.381	0.377
F-test	25.87***	25.61***	24.91***

*Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$*

Appendix B – Assumption testing for 1ˢᵗ stage OLS regression model

I test the following assumptions regarding the OLS regression where the dependent variable is *ln(total compensation – top 5 executives)*:

Assumption 1: No multicollinearity among the independent variables.

Assumption 2: Linearity in parameters.

Assumption 3: The errors have zero mean.

Assumption 4: The variance of the errors is constant and finite over all values of the predictor variables.

~~Assumption 5: The errors are linearly independent of one another~~ (only relevant in time series).

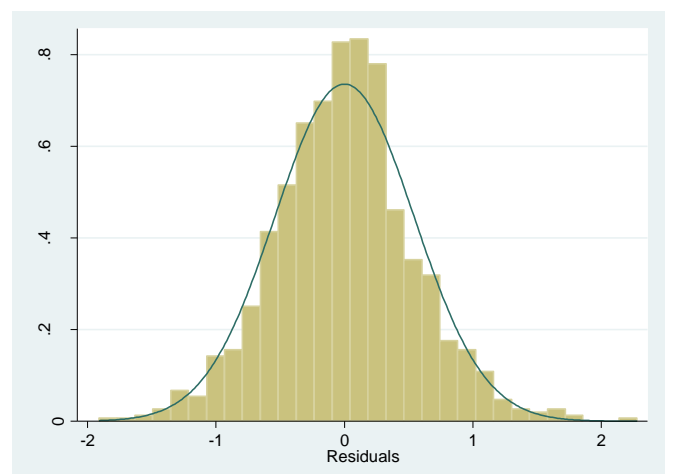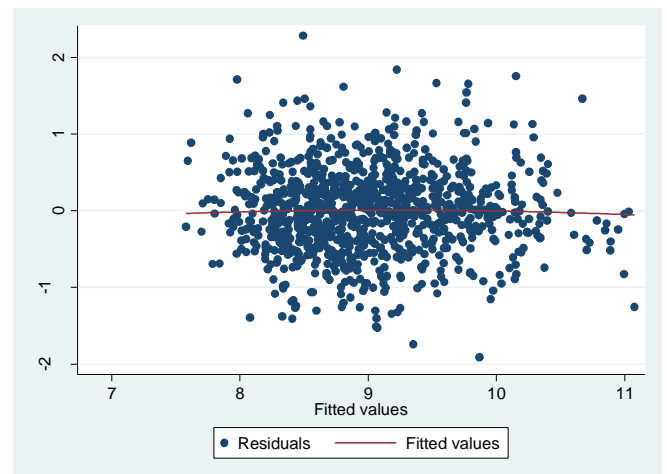Assumption 6: The error is normally distributed.

As for assumption 1:

Stata automatically drops out variables in the case of extreme multicollinearity. However, I did test this manually and found no significant multicollinearity (VIF < 10 and tolerance > 0.2 for all predictor variables).

As for assumption 2, 3 and 4:

Plotting the residuals against the predicted values of y (= ln(total compensation of top 5 executives)) including a *quadratic fit* shows that the residuals are randomly scattered around zero mean. Therefore, assumption 2 and 3 hold. Furthermore, the residuals seem to be heteroskedastic, because the variance is not constant. To overcome the problem of heteroskedasticity, I re-estimate the model using robust standard errors, so that assumption 4 is not violated.

As for assumption 6:

A histogram of the residuals of the re-estimated model (using robust standard errors) with a normal distribution overlay shows that the residuals are reasonably normally distributed.

Appendix C – Assumption testing for <u>OLS regression models with dependent variable Tobin's Q</u>

I test the following assumptions regarding the OLS regression in column (2) of Table 10:

Assumption 1: No multicollinearity among the independent variables.

Assumption 2: Linearity in parameters.

Assumption 3: The errors have zero mean.

Assumption 4: The variance of the errors is constant and finite over all values of the predictor variables.

~~Assumption 5: The errors are linearly independent of one another~~ (only relevant in time series).

Assumption 6: The error is normally distributed.

As for assumption 1:

Stata automatically drops out variables in the case of extreme multicollinearity. However, I did test this manually. Only the two variables with an additional squared of the variable included show high multicollinearity, but this is expected and not problematic as I do not interpret them further.

As for assumption 2, 3 and 4:

Plotting the residuals against the predicted values of y (= Tobin's Q) including a *quadratic fit* shows that the residuals are fairly randomly scattered around zero mean, except at the tails. Overall, assumption 2 and 3 hold. Furthermore, the residuals seem to be heteroskedastic, because the variance is not constant. To overcome the problem of heteroskedasticity, I re-estimate the model using robust standard errors, so that assumption 4 is not violated.
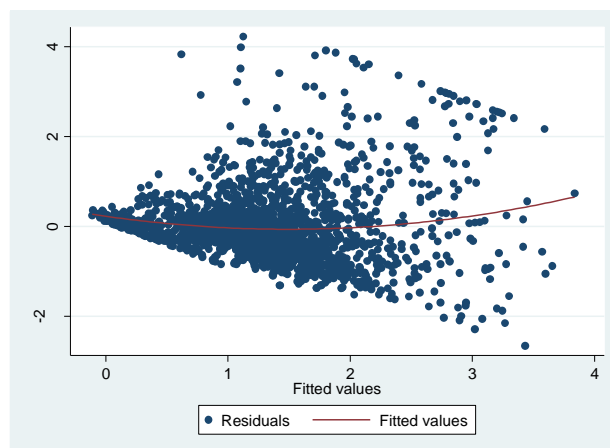
As for assumption 6:

A histogram of the residuals of the re-estimated model (using robust standard errors) with a normal distribution overlay shows that the residuals are not strongly normally distributed. However, this should not pose too much of a problem as the sample size is fairly large (2,025 observations).