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Abstract

We model the firm's optimal choice of capital and goodness subject to financial constraints. Managers and shareholders derive benefits over profits and social responsibility. Goodness is costly and its marginal benefit is finite; as a result, less-constrained firms spend more on goodness. We verify that less-constrained firms do indeed have higher social responsibility scores. Our empirical analysis addresses identification issues that have long plagued the corporate social responsibility literature, establishing the causality of this relationship using a natural experiment. During the technology bubble, previously constrained firms experienced a temporary relaxation of their constraints and their goodness scores also temporarily increased relative to their previously unconstrained peers. This convergence applies to all components of the goodness scores such as community and employee relations and environmental responsibility but not governance.

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1. Introduction

Even though Milton Friedman (1970) declared in a biting op-ed piece in the New York Times that the only social responsibility of corporations is to make money, firms continue to invest significant resources to mitigate the externality-related concerns associated with their production. Such concerns range from environmental pollution to employment standards perceived to be unfair.[1] Precise numbers on how much firms spend to deal with externalities are hard to come by because of a lack of proper accounting and because such practices are intimately connected to how firms set up their production processes.[2] But anecdotal evidence suggests that some firms, especially large corporations, routinely invest hundreds of millions of dollars annually on developing energy conservation practices, employee and community development programs or other altruistic endeavors.[3]

Many theories have been proposed to explain such firm behavior. These theories can be broadly grouped into two categories: stories in which spending on goodness increases profits versus stories in which this spending derives from non-profit motives. Corporate goodness can boost a firm's bottom line by delivering "warm-glow" to its consumers, improving employee efficiency, lessening conflicts among stakeholders, mitigating litigation risk, deterring potential regulation, signaling product quality or as investor relations in dealing with product or capital market boycotts by socially responsible consumers or investors.[4] Non-profit motives for corporate responsibility include the firm acting as a delegated philanthropist

[1]Some notable cases are Nike's use of child labor in developing countries, Walmart's low wage practices and most recently the poor safety standards of British Petroleum.

[2]For instance, corporations increasingly use evaluation systems and compensation programs that include the social performance of managers. See Kaplan and Norton (1996) for a discussion.

[3]In 2009, Intel allocated $100 million for global education programs and energy conservation efforts such as the purchase of renewable energy certificates. In 2007, General Electric gave $160 million to community and employee philanthropic programs and has earmarked billions more for developing eco-friendly products. See Delevingne (2009) for a description of these projects.

[4]For reviews of these strands of theories, see Benabou and Tirole (2010) and Heal (2005). Profit motives for goodness often come under the heading of "Doing Well by Doing Good", which was featured in a well-read article by *The Economist* in 2005. A number of theories of profits from goodness implicitly rely on the idea that firms are well-positioned to deliver warm-glow feelings (Becker (1974) and Andreoni (1989)) to consumers. See for instance Besley and Ghatak (2005) for a model which includes such strategic complementarities involving goodness in the production function. See Baron (2001) for a model of strategic deterrence of regulation through using corporate goodness.

when the firm faces a lower cost for giving than shareholders or agency rationales in which managers consume corporate goodness as a perk or use it to entrench themselves by currying favor with important stakeholders.[5]

There is little evidence for which if any of these factors are important for explaining the variation in corporate goodness in the cross-section or over time. The consensus across many empirical studies is that there is no significant correlation between corporate responsibility and measures of firm financial performance (whether earnings or stock returns).[6] However, cross-firm empirical studies have been plagued by a potential endogeneity problem: financial performance might be an important determinant of corporate responsibility decisions.

In this paper, we take a different approach toward modeling and analyzing this old but increasingly important and controversial topic. The key idea is to model spending on goodness in an environment where firms face financial constraints. We take as exogenous the motives for goodness (which might be profit or non-profit driven) and financial constraints. We solve for the firm's optimal level of capital and goodness. We test the model using a natural experiment in which the excessively high valuations of the Internet bubble of 1996-2000 spilled over even into non-dot-com firms and as a result temporarily relaxed their financial constraints. We look at whether these constrained versus unconstrained firms' investments in goodness, measured using corporate goodness scores, temporarily converged during the Internet bubble period.

Our model has the following key features. The firm is endowed with a utility or benefit function over profits and goodness. The utility function satisfies the usual neoclassical conditions (increasing and concave) and depending on the functional form can capture a number of the motives for goodness (both profit and non-profit) described above. In our set-up, profits and goodness can be either complements or substitutes in the utility function of the firm;

[5]The perspective in Friedman (1970) is that corporate goodness is managerial entrenchment in which managers use corporate cash to further their own interests, whether it be for their own philanthropy or to entrench themselves further. See Tirole (2001) for a discussion of how goodness is related to governance.

[6]Margolis, Elfenbein and Walsh (2007) conduct a meta-analysis of literally hundreds of studies on this relationship. They find that across these studies the average effect is roughly zero and is statistically insignificant.

though for purposes of exposition, it is easier to think about them as complements. Output is generated by a neoclassical (increasing and concave) production function of capital, with a technology parameter that shifts the marginal productivity of capital. Importantly, goodness comes at a cost to profits.

The manager then optimizes the firm's benefit function over capital and goodness subject to a financial constraint that the cost of capital and goodness equal the firm's cash on hand. A firm with little cash on hand is a proxy for a firm that is more equity dependent and less able to raise funds. We assume that the marginal product of capital at zero is infinity; whereas, the marginal benefit of goodness at zero is finite. This assumption means that the firm only considers spending on goodness after it has generated positive output. We also impose a non-negativity constraint on goodness because otherwise a very constrained firm will want to make goodness negative to fund capital investments.

The solution has an intuitive form and can be separated into three regions depending on the level of firm cash or the degree of financial constraints. In the first or unconstrained region, the firm has enough cash to fund its first-best level of capital and goodness. In the mild-constrained region, a firm has enough resources to do some goodness spending. In the very constrained region, the firm does not have enough funding to achieve its first-best level of capital and it spends nothing on goodness. As a result, we have the prediction that less constrained firms spend more on goodness.

We test this prediction using data on scores of corporate social responsibility provided by Kinder, Lydenberg and Domini (KLD). Companies are evaluated based on a number of criteria, including community relations, employee relations, diversity of the workforce, environmental protection, product quality and governance. Our sample consists of S&P 500 firms observed yearly from 1991 to 2008. Firms are scored in terms of concerns and strengths for these six criteria. We consider two measures of corporate concerns and strengths. The first is the simple sum of the scores for strengths and concerns. The second is a measure obtained through factor analysis. These two measures are correlated, though interestingly,

the factor analysis approach puts zero weight on governance when measuring strengths. We take the difference between strengths and concerns (using both the simple sum scores and the factor scores) to be the measures of a firm's goodness. We measure a firm's financial constraint using a variety of measures from the literature including the Kaplan and Zingales (1997) score, share repurchases and bond ratings.

We find that less financially constrained firms indeed have higher goodness scores, using both of our measures of corporate goodness and all of our financial constraint measures. But there is a question of whether this strong correlation is causal. We exploit a natural experiment to buttress the argument that financial constraints cause firms to invest in less corporate goodness. Our identification strategy builds on Baker et al. (2003) and Campello and Graham (2007) who argue that the dot-com bubble relaxed financing constraints even for non-dot-com firms. They show that even non-Internet firms received excessively high valuations and that those that were constrained issued equity to finance capital expenditures and to elevate their cash holdings. If there is a causal connection between financial constraints and corporate goodness, then we expect that during the technology bubble of 1996-2000 previously constrained non-technology firms would increase their corporate goodness relative to other non-technology firms compared to other periods in our sample. Our identification strategy differs from these papers in terms of the set-up and its emphasis that this convergence in goodness scores was indeed temporary and occurred during the dot-com period. As such, we are able to rule out alternative explanations related to coincident trends. We conduct a variety of robustness checks, including showing this result for all of our financial constraint measures.

Finally, we examine which components of our corporate goodness scores are most sensitive to these changes in financial constraints. We first find that we obtain similar results when we define corporate goodness based only on KLD strengths instead of strengths minus concerns. Then we show how financial constraints affect the behavior of firms using the six KLD components used to create the aggregate goodness score separately. Easing constraints

increase a firm's goodness within all six of these components except for corporate governance; the increase in corporate goodness does not appear to be confined to one or two categories. When we examine the actions of firms even more finely by looking at the sub-categories of these six components, we find that two of the most sensitive corporate actions to financial constraints are charitable giving and profit sharing payments to employees. These findings suggest that our results are not simply a manifestation of perk spending. They are also consistent with Tirole (2001) who points out that governance is fundamentally different from goodness since a firm with strong governance will not be able to invest in goodness to appease various stakeholders.

In sum, our paper shows that goodness is costly and determined by a firm's financial status. It proceeds as follows. In Section 2, we present a simple model of a manager's capital and goodness choices in the presence of financial constraints and an exogenously given utility or objective function. In Section 3, we describe the data. We present the empirical results in Section 4 and conclude in Section 5. Details of the proofs for the model are in the Appendix.

2. Model

We develop a static model of the firm's choices of capital (K) and goodness (G). The firm's output is solely a function of production, which is given by the production function $\alpha f(K)$. $f(K)$ is a neoclassical production function with the following properties: $f'(0) = \infty$, $f'(K) > 0$, and $f''(K) < 0$. α is a technology parameter that captures the productivity of capital. For simplicity, we assume that the cost of one unit of capital is 1 and that the cost of one unit of goodness is also 1. Then let Γ denote the amount of cash needed to finance investments in capital and goodness (*i.e.*, the firm faces the financing constraint $K+G \leq \Gamma$). A low Γ is a proxy for a firm that has little cash, that finds it difficult to raise funds in debt markets, and that is more equity dependent. As we elaborate on below, we can think of Γ

as being shifted by aggregate shocks such as the Internet bubble which made financing more accessible (i.e. a higher Γ) through excessively high valuations that the firm can then exploit by issuing over-priced equity.[7]

The firm derives utility over profits and the amount spent on goodness G given by the following utility function:

$$u(\alpha f(K) - K - G, G) \tag{1}$$

We assume that u is increasing in each argument and that D^2u is a negative definite matrix. This utility function is a flexible form meant to capture varied motives for goodness; it can be interpreted as the utility function of shareholders or the manager. Under a non-strategic (*i.e.* non-profit related) motivation, u is the utility that shareholders or the manager get from delegated giving; under an agency interpretation, u is the utility that the manager derives from giving or perhaps from entrenchment. Importantly, u can also be interpreted as providing the payoffs for the firm from investing in goodness for strategic or profit reasons. A benchmark case is where $u(\cdot, \cdot) = f(K) - K - G + v(G)$ and $v(G)$ satisfies the following properties: $v'(0) < \infty$, $v'(G) > 0$ and $v''(G) < 0$. The firm derives the net benefit $v(G) - G$ from goodness that can be interpreted as dollars to the bottom line; perhaps goodness increases profits through some reputation effect or insulates the firm from litigation risk.

We will also place a limit on the degree substitution between profits and goodness in the utility function by assuming that

$$u_{12} \geq u_{11}.$$

Note that we assume the usual nice properties regarding utility function and hence $u_{11} < 0$. u_{12} measures the substitutability of profits and goodness. If $u_{12} > 0$, then goodness and profits are complements; while if $u_{12} < 0$ then profits and goodness are substitutes. If $u_{12} = 0$, then profits and goodness are separable in the utility function of the firm.[8]

[7] This point has been already formalized in Baker et al. (2003) and we use the simplest model for expositional reasons.

[8] It is easiest to think of our setting as one in which goodness and profits complements, but we do allow for substitution, provided it is not too strong.

The firm then has the following constrained optimization problem:

$$\max_{K,G} u(\alpha f(K) - K - G, G) \tag{2}$$

subject to

$$K + G \leq \Gamma \tag{3}$$

and

$$G \geq 0 \tag{4}$$

Because $f'(0) = \infty$, we know that the optimal K is greater than zero whenever $\Gamma > 0$ and so there is no need to impose a non-negativity condition on K. But we do need to impose a non-negativity condition on G because a firm with a financial constraint may potentially want to choose a negative G to loosen that constraint. In fact, we assume that $u_2(\cdot, 0)$ is finite; so whenever Γ is small, the firm would be tempted to choose a negative G.

The solution has three regions defined by the level of cash Γ. The first region, Region 1, is given by $\Gamma \geq \Gamma^{FB}$, where Γ^{FB} is the level of cash that finances the first-best levels of investments in capital and goodness and where the firm is unconstrained (*i.e.*, the constraint given by equation (3) is not binding). Let the optimal unconstrained solution be denoted by (K^{FB}, G^{FB}). The solution K^{FB} satisfies the following equation:

$$\alpha f'(K^{FB}) = 1 \tag{5}$$

Equation (5) is the familiar first-order condition that the marginal product of capital equal to the marginal cost of capital, which we assume is equal to 1. And because $f'' < 0$, we know that K^{FB} is unique.

Furthermore, if

$$-u_1(\alpha f(K^{FB}) - K^{FB}, 0) + u_2(\alpha f(K^{FB}) - K^{FB}, 0) > 0 \tag{6}$$

then $X^{FB} > 0$ solves

$$-u_1(\alpha f(K^{FB}) - K^{FB} - X^{FB}, X^{FB}) + u_2(\alpha f(K^{FB}) - K^{FB} - X^{FB}, X^{FB}) = 0. \quad (7)$$

Equation (7) gives the first-order condition that determines G^{FB}. It states that at the unconstrained solution, the marginal benefit of goodness ($u_2(\alpha f(K^{FB}) - K^{FB} - G^{FB}, G^{FB})$) equals the marginal cost of goodness ($u_1(\alpha f(K^{FB}) - K^{FB} - G^{FB}, G^{FB})$), which is simply the lost marginal utility of profit. We will assume that inequality (6) holds; otherwise there is no investment in goodness at the first best. The negative definiteness of D^2u guarantees that G^{FB} is unique. The first-best level of cash is then given by

$$\Gamma^{FB} = G^{FB} + K^{FB}. \quad (8)$$

We will now consider the solution when the financial constraint is binding. If $\Gamma < \Gamma^{FB}$, then inequality (3) binds. The solution then is further characterized by a unique cut-off value $\Gamma^* < \Gamma^{FB}$. The second region, Region 2, is defined by $\Gamma^* < \Gamma < \Gamma^{FB}$. Here, financial constraints bind but $G > 0$, $G = \Gamma - K$ and an increase in Γ leads to an increase in both K and G. The third region, Region 3, is defined by $\Gamma \leq \Gamma^*$. In this region, financial constraints bind and $G = 0$. An increase in Γ only leads to an increase in K and no change in G. Intuitively, because the marginal product of capital is infinite at zero, a very constrained firm will spend its resources on capital and nothing on goodness. Only when its financial constraint is not very binding will it consider then spending an extra dollar on goodness. As Γ increases and the firm has more financial resources, it begins to spend on goodness.

These results are summarized in the following Theorem, the proof of which we complete in the Appendix.

Theorem 1. *For an unconstrained firm, $\Gamma > \Gamma^{FB}$, the firm invests in the first best levels of capital and goodness. There exists a unique cut-off value Γ^* such that for $\Gamma^* < \Gamma < \Gamma^{FB}$, $G > 0$, $G = \Gamma - K$ and G and K increase with Γ and for $\Gamma \leq \Gamma^*$, $G = 0$ and only K*

increases with Γ.

A firm's financial constraint status is one of the key parameters of our model. Theorem 1 provides a complete guide to how all the variables of interest vary with this parameter. Using Theorem 1, we have the following predictions.

Prediction 1. *Less financially constrained firms spend more on goodness.*

We will test this prediction using measures of corporate goodness and standard measures of financial constraints. We will start by examining simple correlations between firm financial constraints and corporate goodness. Then we will help determine the causal relationship between these constraints and goodness using the natural experiment from the Internet bubble and the following prediction of the model.

Prediction 2. *When aggregate financing constraints ease, the increase in the goodness of financially constrained firms should be bigger than unconstrained or less-constrained firms.*

The reason is simply that unconstrained firms have already made their first-best levels of investments in goodness and hence even if their constraints loosened, they would not change their investments. This is consistent with Baker et al. (2003) and Campello and Graham (2007) who find that unconstrained firms did not change their investment levels nor issue more equity during the Internet period. Prediction 2 is the basis of our natural experiment in which we expect to see a temporary convergence of goodness investments between financially constrained and unconstrained firms during the Internet bubble period of 1996-2010. Indeed, the comparison still holds if we compared constrained versus less constrained firms as less constrained firms would need to increase their investments in goodness by proportionally less than constrained ones who are very far from the first best.

3. Measures of Goodness and Financial Constraints

3.1. Data

Our study uses data from three main sources. Ratings of corporate social responsibility are from the Kinder, Lydenberg, Domini, & Co. (KLD) database. Stock prices and shares outstanding are from the Center for Research in Security Prices (CRSP), and all accounting variables are from Compustat. KLD's coverage of S&P 500 firms starts in 1991; our analysis uses KLD information for S&P 500 firms from 1991 to 2008.

The KLD ratings are built on a point-by-point assessment of companies along a number of dimensions. We focus on ratings in six KLD categories: Community Activities, Diversity, Employee Relations, Environmental Record, Products, and Corporate Governance. To understand how these ratings are calculated, we will describe how KLD measures a firm's rating for the Communities Activities and Environmental Record categories. KLD classifies four Community Activities strengths: "Charitable Giving', "Innovative Giving", "Support for Housing", and "Other Community Strengths". A firm gets a score of one if they perform well in a particular criterion and zero otherwise. There are also four Community Activities concerns: "Investment Controversies", "Negative Economic Impact", "Tax Disputes", and "Other Community Concerns". A firm gets a score of 1 if they have a problem in one of these four sub-categories and zero otherwise. For example, if a company has no strengths or concerns, it receives a Community Activities strength and concern score of zero. Alternatively, if it performs "Charitable Giving" and "Innovative Giving" but also has "Tax Disputes", its strengths score is 2 and concerns score is 1.

For Environmental Record, there are five components of strengths: "Delivers Products or Services that Help Protect the Environment", "Strong Pollution Prevention Program","Uses Recycled Materials or Major Player Recycling Industry", "Energy Efficiency Leader" and "Other Strengths". The potential of one point for each strength means a firm can have a minimum score of zero to a maximum score of 5. There are six components of concerns:

whether a firm has "Hazardous Waste Sites or Waste Management Violations", "Environmental Regulation Violations (Clean Air Act, Clean Water Act, et al.)", "Manufacturer of Ozone-Depleting Chemicals", "Emissions of Toxic Chemicals (from TRI reports)", "Manufacturer of Agricultural Chemicals" and "Other Concerns". One point for each concern means that a firm can have a minimum score of 0 to a maximum score of 6. Ratings for the other categories are calculated similarly.

The scores from these six categories for a firm are summed to arrive at a yearly measures of *Total Strengths* and *Total Concerns*. We only use scores for sub-categories that were available throughout our sample period.[9] For example, there is a Community Activities subcategory called "Indigenous Peoples Relations" that was introduced in 2000. We omit it to allow scores to be comparable over time. There are also two additional categories tracked by KLD beyond the six we consider: Human Rights and Controversial Business. There are no Human Rights subcategories available throughout our sample period so we again omit it to keep our measures comparable over time. Controversial Business pertains to whether the firm is in a controversial line of business. Because there is little a firm can do to change its line of business, we also exclude it from our analysis.

3.2. Factor Analysis and Alternative Measures of Goodness

In addition to *Total Strengths* and *Total Concerns*, we also construct *Factor Score Strengths* and *Factor Score Concerns* by performing factor analysis on the scores from the six components of the KLD ratings described above and taking the first factor score for strengths and concerns. *Total Strengths* and *Total Concerns* puts equal weight across the six categories. There is no reason to think that the categories need to be equal weighted. Factor analysis is one way to let the data speak.[10] Table 1 reports the factor loadings from the factor analysis that is used to construct the *Factor Score Strengths* and *Factor Score Concerns*.

[9] We have also done our empirical work including sub-categories that are added or deleted during our sample period. We obtain very similar results using these alternative corporate goodness measures.

[10] We have also tried a closely related approach of principal components analysis and found similar results.

Panel A reports the results for strengths. The factor analysis places a zero weight on the corporate governance strengths and shifts the remaining weight fairly equally across the remaining five categories, with Diversity strengths getting the most weight (0.51) and the remaining categories receiving a weights between about 0.20 and 0.40. The zero loading on corporate governance is interesting since it says that at least in the domain of strengths, corporate governance is different from the other attributes.

Panel B reports the results for concerns. Here, factor analysis places roughly equal weight across all six categories. Corporate Governance and Diversity concerns get the lowest weight of 0.18 and 0.19 respectively; Product concerns get the highest at 0.26. But the deviation from equal-weighting is very slight in terms of concerns. As we show below in our empirical analysis, using raw KLD scores or factor scores yield for the most part similar results.

We follow the literature and take the difference between strengths and concerns (using both the simple sum scores and the factor scores) to be the measures of a firm's goodness. *Raw Goodness* is strengths minus concerns using the raw KLD data. *Factor Score Goodness* is the strengths minus concerns using the factor scores.

3.3. Measures of Financial Constraints

The literature has many established ways to measure a firm's financial constraint. All the measures are meant to capture the equity dependence of firms, but no measure is perfect. Our strategy involves trying several financial constraint proxies. The first is the Kaplan and Zingales (1997) index that is a weighted score that accounts for a variety of firm characteristics including variables such as firm cash, cashflow, leverage and a firm's productivity measured by a firm's market-to-book ratio. Following Baker et al. (2003), we construct the five variable *KZ Score* for each firm/year as the following linear combination:

$$KZScore_{i,t} = -1.002CF_{i,t}/A_{i,t-1} - 39.368D_{i,t}/A_{i,t-1} - 1.315C_{i,t}/A_{i,t-1} + 3.139B_{i,t} + 0.283Q_{i,t}$$

where $CF_{i,t}/A_{i,t-1}$ is cash flow (Compustat Item 14+Item 18) over lagged assets (Item 6); $DIV_{i,t}/A_{i,t-1}$ is cash dividends (Item 21+Item 19) over assets; $C_{i,t}/A_{i,t-1}$ is cash balances (Item 1) over start-of-the-year book assets (Item 6); book leverage, denoted by $BLEV_{i,t}$, which is total debt divided by the sum of total debt and book equity ((Item 9+Item 34)/(Item 9+Item 34+Item 216)) measured at fiscal year-end, and Tobin's Q is the market value of equity (price times shares outstanding from CRSP) plus assets minus the book value of 16 equity (Item 60+Item 74) all over assets. We winsorize the ingredients of the index before constructing it.[11]

This score measures a firm's equity dependence as captured by its cash and leverage ratios and also a firm's productivity. More productive firms (α in our model) will be more constrained (*i.e.* they are less likely to be in the unconstrained region) all else equal because their first-best level of capital investment will be higher. A worrisome aspect of this measure is that it uses a firm's market-to-book ratio as a proxy for a firm's average productivity from Q-theory. But this is difficult since the market-to-book ratio also captures potential mispricings. This interpretation is potentially problematic in our setting because earlier work argues that the demand for goodness on the part of socially responsible investors has a price effect in the direction of depressing the valuations of bad companies in favor of good companies (see, Heinkel, Kraus and Zechner (2001), Hong and Kacperczyk (2009), Hong and Kostovetsky (2009)). As such, we also consider two other measures of financial constraints.

Our second financial constraint measure is an indicator for whether or not a firm engages in stock repurchases: *No Repurchase Indicator*. We calculate a firm's repurchases as expenditure on the purchase of common and preferred stocks (Compustat Item 115) minus preferred stock reduction (the first difference of Item 10). We then construct a dummy variable equal to one if the firm has no repurchases.[12] Firms that engage in equity repurchases

[11]For some firm/year observations, one or more of the five components used to construct the KZ score will be missing. In those circumstances, we use a firm's KZ score from the previous year. We obtain similar results if we drop these observations instead of using previous values of the KZ score.

[12]We parameterize the variable to turn on when a firm has no repurchases instead of when a firm has repurchases to standardize all of our financial constraint variables so that higher values correspond to more constrained firms.

are presumably less equity dependent and hence less financially constrained.

Our final measure of firm financial constraints is a firm's average bond rating. A lower bond rating forces a firm to be more equity dependent and hence more financially constrained. Using data from Lehman Brothers and Merrill Lynch, we take all of the bonds issued by a firm and assign a numerical score to its rating from Moody's.[13] For each year, we take the average of these numerical scores and merge these averages with the KLD data set.[14] We can confidently merge about three-quarters of the KLD sample with bond information, so analysis using bond ratings will use a smaller data sample than the rest of the analysis.[15]

3.4. Summary Statistics

Table 2 provides the summary statistics on our variables of interest for the sample of S&P 500 firms from 1991 to 2008. We start with the KLD measures. The means of *Total Strengths* and *Total Concerns* are about 2 and 1.6 respectively. Figure 1 shows the time trend of these averages; both are increasing over time. *Raw Goodness* has a mean of .41 with a standard deviation of about 2.4. Figure 2 shows the trend in *Raw Goodness* over time. It increases during the early part of the sample, peaking in the late nineties and then it starts declining and even becomes negative the last two years of the sample. Our analysis below differences out this aggregate trend and hence it is not crucial to our analysis. But it is interesting to note in passing that the aggregate goodness measure peaks during the dot-com period when financial constraints were looser, consistent with the premise of our natural experiment. We also show the means of the factor score variables, which have similar time trends to the raw

[13]Lower quality ratings are assigned higher numerical scores. AAA bonds are 2; AA1 bonds are 3; AA2 bonds are 4; AA3 bonds are 5; A1 bonds are 6; A2 bonds are 7; A3 bonds are 8; BAA1 bonds are 9; BAA2 bonds are 10; BAA3 bonds are 11; BA1 bonds are 12; BA2 bonds are 13; BA3 bonds are 14; B1 bonds are 15; B2 bonds are 16; B3 bonds are 17; CAA1 bonds are 18 ; CAA2 bonds are 19; CAA3 bonds are 20; CA bonds are 21; C bonds are 22; D bonds are 23.

[14]We have also used the maximum and minimum bond rating for the firm in a year instead of the average and obtain similar results to what is reported.

[15]We first try to match bond ratings to KLD observations using CUSIPs. For KLD observations that are not matched with bond information at this point, we then try to find their bond information matching on firm name. Some observations are missing bond information because the firm had no outstanding bonds at the time and others are missing because they were missed using this procedure.

KLD measures.

The second part of Table 2 presents the summary statistics of the three financial constraint measures. In this data set, the financial constraint information is calculated using firm information from the year before the KLD score.[16] For all three measures, firms with higher values are considered more constrained.

4. Empirical Results

4.1. Financial Constraints and Corporate Goodness

We begin our empirical work by taking a detailed look at how firm goodness varies with financial constraints. Our model predicts that goodness should increase as firms become less constrained. We examine the results of OLS regressions of firm goodness on our three standard measures of financial constraints. These results are presented in Table 3. In Panel A of Table 3, the dependent variable of the regressions is *Raw Goodness*; *Factor Score Goodness* is the dependent variable in the regressions presented in Panel B. Besides the financial constraint measures, also included in the regression specification are *Year Effects*, Fama-French 49 *Industry Effects* and in the even-numbered columns *Market Capitalization Quintile Effects*.

We start by looking at how firm goodness varies with *KZ Score* in the first two columns of Panel A. In column (1), the coefficient on *KZ Score* is negative a statistically different from zero, indicating that more constrained firms have less corporate goodness. The magnitude of the coefficient suggests that easing a firm's constraint with a one standard deviation decline in *KZ Score* (-1.24) is associated with a .16 increase in *Raw Goodness*. There are several ways to describe the size of this increase in *Raw Goodness*. For example, it is about 7% of the standard deviation of *Raw Goodness* (2.42); also, it is about 15% of the standard deviation of the yearly change in *Raw Goodness* (1.12). In column (2), *Market Capitalization Quintile*

[16] In other words, the financial constraint measures are lagged one year.

Effects are added to the regression specification; the relationship between *KZ Score* and *Raw Goodness* is almost identical to column (1), suggesting that our results are not being driven by comparing relatively large and small S&P 500 firms.

The finanical constraint measure in the next two columns is *No Repurchase Indicator*. In column (3) of Panel A, there is a negative and statistically significant relationship between this constraint measure and *Raw Goodness*. The coefficient suggests that a firm doing no repurchases the previous year has a *Raw Goodness* score that is about .23 lower than other firms. This is about 10% of a standard deviation of *Raw Goodness* and about 20% of a standard deviation of the yearly change in *Raw Goodness*. When *Market Capitalization Quintile Effects* are added to the specification in column (4), the estimated relationship between *No Repurchase Indicator* and *Raw Goodness* is slightly smaller but similar to column (3).

The financial constraint of the final two columns is *Average Bond Rating*. In column (5), there is a negative and statistically significant relationship between bond rating score and *Raw Goodness*. The size of the coefficient indicates that a one standard deviation improvement in bond rating quality (-2.90) is associated with a .45 increase in *Raw Goodness*. This is about 19% of a standard deviation of *Raw Goodness* and about 37% of a standard deviation of the yearly change in *Raw Goodness*. This relationship is qualitatively unchanged when *Market Cap Quintile Effects* are added to the regression specification in the final column.

Panel B of Table 3 is identical to Panel A, except that the dependent variable is *Factor Score Goodness* instead of *Raw Goodness*. The pattern of results is very similar to Panel A. Using all the different financial constraint measures, the results suggest that more financially constrained firms have lower *Factor Score Goodness*. The magnitudes of these relationships are also very similar to Panel A.

Taken together, Table 3 shows that financially constrained firms have less corporate goodness. However, this does not necessarily mean that financial constraints are *causing*

firms to produce less goodness. Other unobserved factors might be causing some firms to be financially constrained and to have relatively little corporate goodness. Establishing causality is a ubiquitious issue in the corporate responsibility literature. We next turn to a natural experiment that we will argue will help us determine whether there is a causal relationship between financial constraints and corporate responsibility.

4.2. Natural Experiment

To determine the causality of the relationship between financial constraints and corporate goodness, we need to find some exogenous variation in the financial constraints that firms face and observe how this variation alters their corporate goodness decisions. Our candidate for this exogenous variation is the technology bubble of the late 1990s. As argued in the Introduction and the Model sections, during this period, it was easier for firms that were constrained to raise funds only with equity to raise capital. Therefore, if there is a causal relationship between financial constraints and corporate goodness, we expect that during this period the negative relationship between financial constraints and corporate goodness should be smaller than other periods. We now examine this relationship between the technology bubble and sensitivity of financial constraints and corporate goodness using the KLD data set.

Because our data sample is from 1991 to 2008, we have KLD information for S&P 500 firms before, during and after the tech bubble. We construct a difference-in-difference estimator comparing the sensitivity of financial constraints and corporate goodness during the bubble to the sensitivity during the periods before and after the bubble. To do this, we need to classify firms as constrained or not based on criteria that will not change over time because of the Internet bubble. We construct measures of firm financial constraints based on their constraint measures during 1991 and 1992: the first two years of our data. That is, we will classify a firm over the entire sample based on their financial constraint measures during

these two years, making this classification time invariant.[17] We create three measures. *Initial KZ Score* is the average *KZ Score* of a firm during 1991 and 1992. *Initial No Repurchase Indicator* is a dummy variable equal to one if the firm did not have a repurchase in either of those years. Finally, *Initial Bond Rating* is the average numerical rating of the firm's bonds in 1991 and 1992.

Table 4 shows summary statistics of the diff-in-diff data set. The sample includes S&P 500 non-technology firms that have observations in 1991 or 1992. We drop technology firms from the sample because we worry that the Internet bubble might have affected the corporate goodness of technology firms for reasons other than changes in their financial constraints.[18] The summary statistics of the diff-in-diff sample is similar to the full sample presented in Table 2.

The regression specification we estimate with this sample is one of our measures of corporate goodness on a measure of initial finanical constraint, a dummy variable for the observation being during the technology bubble, an interaction of these two variables and year and firm fixed effects.[19] Because the initial financial constraint variable is time invariant and the technology bubble dummy has no cross-sectional variation, they cannot be uniquely identified when year and firm fixed effects are included in the specification. The coefficient of interest is on the interaction of the initial financial constraint variable and the technology bubble dummy; it shows how the relationship between financial constraints and corporate goodness is different during the Internet bubble compared to the rest of the sample.

Table 5 shows the diff-in-diff regression results for both of our measures of corporate goodness and the three measures of initial financial constraints. As before, Panel A shows the results with *Raw Goodness* as the dependent variable. The results in Panel B with *Factor Score Goodness* as the dependent variable are similar. The first column uses *Initial*

[17] Therefore, our sample for the diff-in-diff estimation will only include firms that we observe in 1991 and/or 1992.

[18] We classify technology firms based on SIC codes. Firms with three digit SIC codes of 355, 357, 366, 367, 369, 381, 382 and 384 are considered technology firms.

[19] The technology bubble period is defined as observations from 1996 through 2000.

KZ Score as the financial constraint measure. The coefficient on the interaction term is positive and statistically significant from zero, indicating that more financially constrained firms have higher corporate goodness scores during the technology bubble compared to other firms than other periods in the data sample. The magnitude of the interaction term is similar in size but opposite signed to the average relationship between *KZ Score* and *Raw Goodness* shown in Table 3, suggesting that the negative effect of *KZ Score* on corporate goodness is roughly eliminated during the Internet bubble when traditional financial constraints are relatively unimportant.

Column (2) shows the results when the financial constraint measure is *Initial No Repurchase Indicator*. As in column (1), the coefficient on the interaction term is positive and statistically significant, showing that firms that did not repurchase have higher corporate goodness scores compared to other firms during the Internet bubble compared to other periods. Again, the coefficient on the interaction is roughly similar in size but opposite signed to the average effect of no repurchases on corporate goodness shown in Table 3, indicating that during the technology bubble this constraint did not lower corporate goodness. Finally, column (3) shows the results using *Initial Bond Rating* as the measure of financial constraint. It shows a very similar pattern to the results using the other two financial constraint measures.

These diff-in-diff results are consistent with a causal relationship between financial constraints and corporate goodness. When constraints exogenously relaxed for firms during the technology bubble, more-constrained firms increased their corporate goodness relative to less-constrained firms compared to other time periods. However, there are some important assumptions we must make to interpret the diff-in-diff results as causal that we will now examine. The most important assumption of this methodology is that there is no other reason why more financially constrained firms have more corporate goodness relative to other firms during the Internet bubble compared to other periods besides the direct effect of the easing the importance of financial constraints during the bubble. There are a few simple stories that can be told in which this assumption might not hold; however, we are fortunate to have

data to help determine whether these alternative stories are important.

One potential problem that is a concern when using a diff-in-diff methodology is that the treatment and control groups might have different pre-existing time trends in the outcome variable. In our context, it might be worrisome if more financially constrained and less-constrained firms have differently evolving trends in corporate goodness over the period of our sample. For example, if technology was changing so that corporate goodness was increasing for more financially constrained firms over time relative to other firms, then a diff-in-diff estimator might be capturing that pre-existing time trend instead of the causal effect of the bubble.

Another potential problem with the diff-in-diff strategy involves attrition. Our sample consists of S&P 500 firms with KLD and financial constraint information in 1991 or 1992. Some of those firms disappear later in the sample. If there is differential attrition across treatment and control groups that changes the average corporate goodness for those groups, then the diff-in-diff estimator could be picking up this attrition effect instead of the causal effect of easing financial constraints. For example, it might be that more financially constrained firms that spend a lot of resources on corporate goodness are financially vulnerable, increasing the likelihood that they disappear later in the sample. Also, the technology bubble might alter these attrition probabilities.

Luckily, our data set allows us to determine how important these potential problems might be. Our data sample spans both sides of the technology bubble; that is, we have a period before the Internet bubble (1991-1995), a period during the bubble (1996-2000) and a period after the bubble (2001-2008). Therefore, we can calculate two diff-in-diff estimators. The first compares the sample before the technology bubble to the technology bubble; the second compares the technology bubble period to the post-bubble period. If the technology bubble estimator is measuring a causal effect of easing financial constraints on corporate goodness, then we expect these two diff-in-diff estimators to produce similar estimates. If these potential problems are important, we expect the two estimators to produce

substantially different results.

To see this, consider the example where there are different pre-existing trends in corporate goodness between more financially constrained and less-constrained firms: corporate goodness is growing over time for more financially constrained firms compared to others for reasons we cannot measure. The diff-in-diff estimator comparing the pre-bubble sample to the bubble sample would produce a positive estimate of corporate goodness during the bubble for financially constrained firms compared to others because of this time trend even if there is no causal impact of the Internet bubble on corporate goodness. However, the diff-in-diff estimator comparing the bubble sample to the post-bubble sample would produce the opposite estimate. The time trend would cause the corporate goodness of financially constrained firms to be lower compared to other firms during the technology bubble.

The attrition argument is a little more complicated. Consider the story where more financially constrained firms that produce a lot of corporate goodness are financially vulnerable and this vulnerability is less important during the Internet bubble. The diff-in-diff estimator comparing the technology bubble to the later sample might be problematic. After the Internet bubble ends, these vulnerable firms are more likely to disappear, decreasing the average corporate goodness of more financially constrained firms after the technology bubble even if individual firms do not change their behavior. However, this should not be a problem for the diff-in-diff that compares the pre-bubble sample to the bubble sample. During the pre-bubble period, vulnerable firms are leaving the sample, decreasing the average corporate goodness of financially constrained during this period. But when this attrition ends during the technology bubble, this should not increase the average corporate goodness of financially constrained firms (there is no sample replacement). If we observe an increase in corporate goodness for more financially constrained firms compared to other firms during the bubble compared to earlier, it cannot be driven by this type of attrition.

Table 6 presents the estimates of the two diff-in-diffs. We estimate them using both of our corporate goodness measures and all three of our financial constraint measures. The odd-

numbered columns show the diff-in-diff comparing the pre-bubble sample to the technology bubble (Early). The even-numbered columns present the diff-in-diff using the technology bubble and the post-bubble samples (Late). For all of the different combinations of goodness and financial constraint measures, the estimates from the two diff-in-diffs are very similar. Not surprisingly, the estimates of the coefficients of the interaction of financial constraints and the technology bubble indicator are less precise than those presented in Table 5 because of the smaller sample size. But there is no evidence of systematic differences between the two diff-in-diff estimators consistent with concerns that our results are being driven by pre-existing trends or sample attrition, buttressing the argument that the diff-in-diff estimators are measuring a causal effect.

We plot how the goodness scores evolve for our two groups, the initial constrained versus the unconstrained, using the three different measures of financial constraints, KZ in Figure 3, repurchases in Figure 4 and bond ratings in Figure 5. One can see that the growth of the goodness scores for the initially constrained group grows much faster than the unconstrained group in the dot-com period and then drops much faster after the dot-com period. These figures attest graphically to the temporary convergence of the goodness scores of constrained and unconstrained firms during the dot-com period, very much consistent with our theory.

4.3. Decomposing Corporate Goodness

We have shown that financial constraints causally affect the corporate goodness of firms using aggregate measures of corporate goodness. Next we turn to examining how these constraints affect the components that make up the aggregate goodness measures. Both of our aggregate goodness measures are functions of KLD strengths and concerns. We first consider alternative measures of goodness that include only KLD strengths. We ask how much of the relationship between financial constraints and corporate goodness is being driven by only strengths.

We create two measures of corporate goodness based only on strengths: *Total Strengths*

and *Factor Score Strengths*. These are just the strength measures used to calculate *Raw Goodness* and *Factor Score Goodness*. Table 7 presents the diff-in-diff estimates using these two strength measures as dependent variable. That is, the regressions are identical to those presented in Table 5, but the dependent variables are *Total Strengths* and *Factor Score Strengths* instead of the aggregate goodness measures that use both strengths and concerns. The coefficients on the interaction term of financial constraints and the technology bubble indicator are all positive as they were in Table 5. However, all of the coefficients are smaller in magnitude than those in Table 5, indicating that, although strengths do change as financial constraints change, they are not the entire story. Concerns also play a role in the adjustment of corporate goodness to financial constraints.

We next split up our measure of aggregate corporate goodness into its six components and measure how financial constraints affect these components separately. The results are presented in Table 8. Again, the specification is identical to the diff-in-diff model presented in Table 5 except that the dependent variable is the difference of strengths and concerns for the six KLD categories. Not surprisingly, the results are substantially less precise than the results using the aggregate measure. The pattern of results suggests that financial constraints have an effect on the behavior of firms across all of the categories except corporate governance. Using any of the financial constraint measures, the effect of the technology bubble on corporate governance behavior is always zero. Otherwise, the results suggest that the aggregate effect of financial constraints on corporate goodness is not concentrated in behavior in one or two KLD categories.

Finally, we investigate the effect of financial constraints on some of the KLD sub-categories. There are several dozen sub-categories that make up the six categories we use to create the aggregate goodness measure. For the vast majority of them, it is not possible to find a precise relationship between financial constraints and whether firms have strengths and concerns in these sub-categories. There are two strength sub-categories where we measure a substantial effect of financial constraints on behavior; we show these results in Table 9. The

first sub-category is an indicator for whether a firm provides substantial charitable giving; this is a sub-category of the Community Relations category. The second is an indicator for whether a firm has a cash profit-sharing program with its employees: a part of the Employee Relations category. The diff-in-diff results in Table 9 show that the technology bubble had an effect on the presence of both of these sub-categories, especially using the first two financial constraint measures. One probably does not want to make too much of these results, but it is interesting that both of these sub-categories involve management giving cash to outside parties.

5. Conclusion

In this paper, we develop a simple model to understand how corporate goodness varies with financial constraints. The model predicts that less financially constrained firms ought to spend more on goodness. We confirm this prediction empirically. These findings are important in that they show that goodness is costly and goodness is a complement to profits. These variables explain quite a bit of the variation in firm goodness. They also rule out a number of explanations presented in the literature for corporate goodness.

Consumers and investors often take actions to induce firms to increase corporate goodness (see, e.g., Barber (2007)). These include boycott of products or limits to investing in a firms' equity or debt. Our findings suggest that smaller more financially constrained firms may react differently to these inducements when compared to larger less constrained firms. We plan to pursue some of these questions in future research.

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Appendix

Proof of Theorem 1. What determines the cut-off level of financial constraint at which the firm will invest its first dollar in goodness? It has to be the point where the firm is indifferent between allocating a dollar to goodness or allocating it to capital at $\Gamma = \Gamma^*$ and $G = 0$. Put differently, the cut-off value Γ^* solves the following equation

$$-u_1(\alpha f(\Gamma^*) - \Gamma^*, 0)\alpha f'(\Gamma^*) + u_2(\alpha f(\Gamma^*) - \Gamma^*, 0) = 0, \tag{9}$$

where the first term is minus 1 times the marginal benefit of a dollar allocated to capital and the second term is the marginal benefit of allocating a dollar to goodness. Because $f'(0) = \infty$ and $u_2(\cdot, 0) < \infty$ the left-hand side of equation (9) equals $-\infty$ at $\Gamma^* = 0$. In addition, from the assumption expressed by (6), the left-hand side of (9) is positive at $\Gamma^* = K^{FB} < \Gamma^{FB}$. Furthermore, differentiating the equation (9) with respect to Γ^* one obtains

$$-u_{11}(\alpha f'(\Gamma^*) - 1)\alpha f'(\Gamma^*) + u_{21}(\alpha f'(\Gamma^*) - 1) - u_1\alpha f''(\Gamma^*) > 0,$$

because $\alpha f'(\Gamma^*) > 1$ and $u_{11} < u_{12}$. Hence there is a unique $\Gamma^* < K^{FB} < \Gamma^{FB}$ such that equation (9) holds.

Moreover, in Region 2 an increase in Γ leads to an increase in both output and goodness. In fact, here $G = \Gamma - K$ and thus

$$u_1(\alpha f(K) - \Gamma, \Gamma - K)\alpha f'(K) - u_2(\alpha f(K) - \Gamma, \Gamma - K) = 0 \tag{10}$$

Thus

$$\frac{\partial K}{\partial \Gamma} = -\frac{(-u_{11} + u_{12})\alpha f' - u_{22} + u_{21}}{u_{11}\alpha^2(f')^2 - u_{12}\alpha f' - u_{21}\alpha f' + u_{22} + u_1\alpha f''}. \tag{11}$$

Notice that the first four terms of the denominator forms a quadratic form:

$$(-\alpha f', 1) * D^2u * (-\alpha f', 1)' < 0$$

Because $D^2u < 0$, it follows that the first four terms are less than zero and so is the fifth term $u_1\alpha f''$ by concavity of the production function. Now consider the numerator. Because $\alpha f' \geq 1$ and $u_{11} < u_{12}$

$$(-u_{11} + u_{12})\alpha f' - u_{22} + u_{21} > -u_{11} + u_{12} - u_{22} + u_{21} > 0$$

again from using

$$-(1, -1) * D^2u * (1, -1)' > 0$$

(i.e. the negative of the quadratic form on with a negative definite matrix is positive). Hence we have $0 < \frac{\partial K}{\partial \Gamma}$. Furthermore using $\alpha f' > 1$ and again the inequality $u_{11} < u_{12}$, we can show that

$$\frac{\partial K}{\partial \Gamma} < 1.$$

This is equivalent to showing that

$$u_{11}\alpha^2(f')^2 - u_{12}\alpha f' - u_{21}\alpha f' + u_2 2 < (u_1 1 - u_1 2)\alpha f' + u_{22} - u_{21}$$

(i.e. the denominator is bigger in absolute value than the numerator, or that the denominator is more negative than the numerator is more negative). This is equivalent to

$$(u_1 1\alpha f' - u_{21})\alpha f' < u_{11}\alpha f' - u_{21}$$

To summarize, $\Gamma \leq \Gamma^*$ defines *Region 3*. In this region, the optimal $K = \Gamma$ and the optimal $G = 0$, since the right hand side of (9) is negative. *Region 2* is defined as $\Gamma^* < \Gamma < \Gamma^{FB}$. In this region financial constraints bind, but $G > 0$ and an increase in Γ leads to an increase in both output and goodness. Finally, *Region 1* is where $\Gamma \geq \Gamma^{FB}$, and firms choose the first best.

Table 1: Factor Loadings of the First Factor of Strengths and Concerns

The entries are the factor loadings on the components of strengths and concerns from factor analysis. These loadings are used to create the variables *Factor Score Strengths* and *Factor Score Concerns*.

Panel A: Strengths	
Total Environmental Strengths	.19
Total Corporate Governance Strengths	-.01
Total Community Strengths	.34
Total Diversity Strengths	.51
Total Product Quality Strengths	.36
Total Employee Relation Strengths	.39

Panel B: Concerns	
Total Environmental Concerns	.21
Total Corporate Governance Concerns	.18
Total Community Concerns	.23
Total Diversity Concerns	.19
Total Product Quality Concerns	.26
Total Employee Relation Concerns	.22

Table 2: Summary Statistics of Main Data Set

The entries are summary statistics of the data set used to measure the relationship between firm financial constraints and corporate goodness. The sample consists of yearly observations of S&P 500 firms from 1991 to 2008 that can be matched to corporate responsibility information from KLD and data from Compustat and CRSP to calculate financial constraint information. There are 6798 observations. *Total Strengths* is the sum of strengths a firm has in a year (measured consistently across years). *Total Concerns* is the sum of concerns a firm has in a year (measured consistently across years). *Raw Goodness* is the difference of *Total Strengths* and *Total Concerns*. *Factor Score Strengths* is the first factor score from a factor analysis of the components of strengths. *Factor Score Concerns* is the first factor score from a factor analysis of the components of concerns. *Factor Score Goodness* is the difference of *Factor Score Strengths* and *Factor Score Concerns*. *KZ Score* is a linear combination of a firm's cash flow, dividends, cash balances, book leverage and Tobin's Q measured the previous year. Higher *KZ Score* is associated with more financial constraints. *No Repurchase Indicator* is a dummy for the firm not having any repurchases the previous year. *Average Bond Rating* is the average Moody rating of the firm's bonds the previous year. Higher values are associated with lower credit quality. Standard deviations are in brackets.

	Mean	25th Percentile	Median	75th Percentile
	(1)	(2)	(3)	(4)
Raw KLD Measures				
Total Strengths	2.01	0	1	3
	[2.02]			
Total Concerns	1.60	0	1	2
	[1.91]			
Raw Goodness	.41	-1	0	2
	[2.42]			
Factor Scores of KLD Measures				
Factor Score Strengths	-.00	-.67	-.13	.30
	[.68]			
Factor Score Concerns	.02	-.47	-.19	.33
	[.77]			
Factor Score Goodness	-.02	-.51	.03	.46
	[.88]			
Financial Constraint Measures				
KZ Score	.86	.26	.85	1.45
	[1.24]			
No Repurchase Indicator	.33			
Average Bond Rating	8.42	6.73	8.00	10.00
	[2.90]			

Table 3: OLS Estimates of the Relationship between Financial Constraints and Corporate Goodness

The entries are OLS regression coefficients measuring the relationship between financial constraints and corporate goodness. In Panel A, the dependent variable of the regressions is *Raw Goodness*; the dependent variable in Panel B is *Factor Score Goodness*. In the first two columns, the financial constraint measure is *KZ Score*. The financial constraint measure in columns (3) and (4) is *No Repurchase Indicator*, and *Average Bond Rating* is the financial constraint measure of the last two columns. *Year Effects* and Fama-French 49 *Industry Effects* are included in all the specifications. Also, *Market Cap Quintile Effects* are included in the specifications shown in the even-numbered columns. Standard errors are in parentheses and are clustered to account for the potential correlation of multiple observations of the same firm across years.

Panel A: Raw Goodness

	KZ Score		No Repurchase		Bond Rating	
	(1)	(2)	(3)	(4)	(5)	(6)
Financial Constraint Measure	-.130	-.112	-.225	-.169	-.156	-.150
	(.046)	(.045)	(.089)	(.086)	(.028)	(.033)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market Cap Quintile Effects	No	Yes	No	Yes	No	Yes
Observations	7500	7500	7922	7922	5904	5904

Panel B: Factor Score Goodness

	KZ Score		No Repurchase		Bond Rating	
	(1)	(2)	(3)	(4)	(5)	(6)
Financial Constraint Measure	-.063	-.061	-.055	-.053	-.052	-.064
	(.017)	(.016)	(.032)	(.032)	(.011)	(.012)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market Cap Quintile Effects	No	Yes	No	Yes	No	Yes
Observations	7500	7500	7922	7922	5904	5904

Table 4: Summary Statistics of Bubble Difference-in-Difference Sample

The entries are summary statistics of the data set used to estimate how the tech bubble affected the relationship between financial constraints and corporate goodness. The sample consists of yearly observations of non-tech S&P 500 firms from 1991 to 2008 that have observations in 1991 and/or 1992 and can be matched to corporate responsibility information from KLD and data from Compustat and CRSP to calculate financial constraint information. *Raw Goodness* and *Factor Score Goodness* are defined as before. The financial constraint measures are measured in 1991 and 1992. *Initial KZ Score* is the average *KZ Score* of the firm during those two years. *Initial No Repurchase Indicator* is a dummy variable for the firm having no repurchases in either 1991 or 1992. *Initial Bond Rating* is the average bond rating of the firm during those two years. Standard deviations are in brackets.

	Mean	25th Percentile	Median	75th Percentile
	(1)	(2)	(3)	(4)
Goodness Measures				
Raw Goodness	.39	-1	0	2
	[2.44]			
Factor Score Goodness	.01	-.48	.03	.57
	[.88]			
Financial Constraint Measures				
Initial KZ Score	.48	-.04	.50	1.18
	[1.29]			
Initial No Repurchase Indicator	.55			
Initial Bond Rating	7.45	5.86	7.03	9.00
	[2.83]			

Table 5: The Effect of the Tech Bubble on the Relationship between Financial Constraints and Corporate Goodness

The entries are OLS regression coefficients measuring how the tech bubble affected the relationship between financial constraints and corporate goodness. In Panel A, the dependent variable of the regressions is *Raw Goodness*; the dependent variable in Panel B is *Factor Score Goodness*. *Financial Constraint* is one of the three measures of the firm's initial financial condition: *Initial KZ Score*, *Initial No Repurchase Indicator* and *Initial Bond Rating*. *Bubble Indicator* is a dummy that the observation is between 1996 and 2000. Because *Year Effects* and *Firm Fixed Effects* are included in the regression specifications, the coefficients for *Bubble Indicator* and the initial financial state of the firms are not uniquely identified. Standard errors are in parentheses and are clustered to account for the correlation of observations of a firm over time.

Panel A: Raw Goodness

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.165	.285	.102
	(.050)	(.144)	(.032)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Panel B: Factor Score Goodness

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.056	.097	.040
	(.018)	(.053)	(.012)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Table 6: Robustness Checks of the Difference-in-Difference Estimates

The entries are coefficients of OLS regressions measuring how the tech bubble affected the relationship between financial constraints and corporate goodness using different samples. The regressions are identical to those presented in Table 5 except that the results shown in the odd-numbered columns include observations from 1991 to 2000 (Early) and the results shown in the even-numbered columns include observations from 1996 to 2008 (Late). Standard errors are in parentheses and are clustered to account for the correlation of observations of a firm over time.

Panel A: Raw Goodness

	KZ Score		No Repurchase		Bond Rating	
	Early	Late	Early	Late	Early	Late
	(1)	(2)	(3)	(4)	(5)	(6)
Financial Constraint×Bubble Indicator	.152	.172	.335	.252	.100	.094
	(.056)	(.100)	(.164)	(.228)	(.036)	(.061)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3386	2826	3543	2971	2689	2242

Panel B: Factor Score Goodness

	KZ Score		No Repurchase		Bond Rating	
	Early	Late	Early	Late	Early	Late
	(1)	(2)	(3)	(4)	(5)	(6)
Financial Constraint×Bubble Indicator	.046	.068	.137	.058	.044	.033
	(.019)	(.037)	(.060)	(.087)	(.013)	(.023)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3386	2826	3543	2971	2689	2242

Table 7: The Effect of the Tech Bubble on the Relationship between Financial Constraints and Corporate Strengths

The entries are OLS regression coefficients measuring how the tech bubble affected the relationship between financial constraints and corporate strengths. The regression specifications are identical to those presented in Table 5 except that the dependent variable in Panel A is *Total Strengths* and the dependent variable in Panel B is *Factor Score Strengths*. Standard errors are in parentheses and are clustered to account for the correlation of observations of a firm over time.

Panel A: Total Strengths

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.060	.171	.053
	(.038)	(.109)	(.024)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Panel B: Factor Score Strengths

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.024	.060	.019
	(.013)	(.037)	(.008)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Table 8: Exploring the Effect of the Tech Bubble on Corporate Goodness by Category

The entries are OLS regression coefficients measuring how the tech bubble affected the relationship between financial constraints and corporate goodnesss. The regression specifications are identical to those presented in Table 5 except that the dependent variable in each panel is a different category of corporate goodness: Environmental, Corporate Governance, Community, Diversity, Product Quality and Employee Relations. Standard errors are in parentheses and are clustered to account for the correlation of observations of a firm over time.

Panel A: Environmental

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.019	.103	.023
	(.026)	(.064)	(.015)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Panel B: Corporate Governance

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	-.004	-.001	-.001
	(.004)	(.011)	(.002)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Panel C: Community

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.010	.050	.008
	\(.016)	(.044)	(.010)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Table 8 (cont.)

Panel D: Diversity

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.012	.063	.016
	(.023)	(.068)	(.013)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Panel E: Product Quality

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.056	.031	.033
	(.020)	(.056)	(.013)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Panel F: Employee Relations

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.073	.038	.021
	(.028)	(.067)	(.015)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Table 9: Exploring the Effect of the Tech Bubble on the Presence of Particular Corporate Strengths

The entries are OLS regression coefficients measuring how the tech bubble affected the relationship between financial constraints and corporate strengths. The regression specifications are identical to those presented in Table 5 except that the dependent variable in Panel A is *Indicator for Charitable Giving Strength* and the dependent variable in Panel B is *Indicator for Cash Profit Sharing Strength*. Standard errors are in parentheses and are clustered to account for the correlation of observations of a firm over time.

Panel A: Charitable Giving

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.012	.056	.001
	(.007)	(.022)	(.005)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Panel B: Cash Profit Sharing with Employees

	KZ Score	No Repurchase	Bond Rating
	(1)	(2)	(3)
Financial Constraint×Bubble Indicator	.021	.045	.007
	(.010)	(.024)	(.006)
Year Effects	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Observations	5039	5288	3999

Figure 1: Time Trend of Corporate Strengths and Concerns

The figure shows the time trend in the yearly average *Total Strengths* and *Total Concerns* of S&P 500 firms between 1991 and 2008.

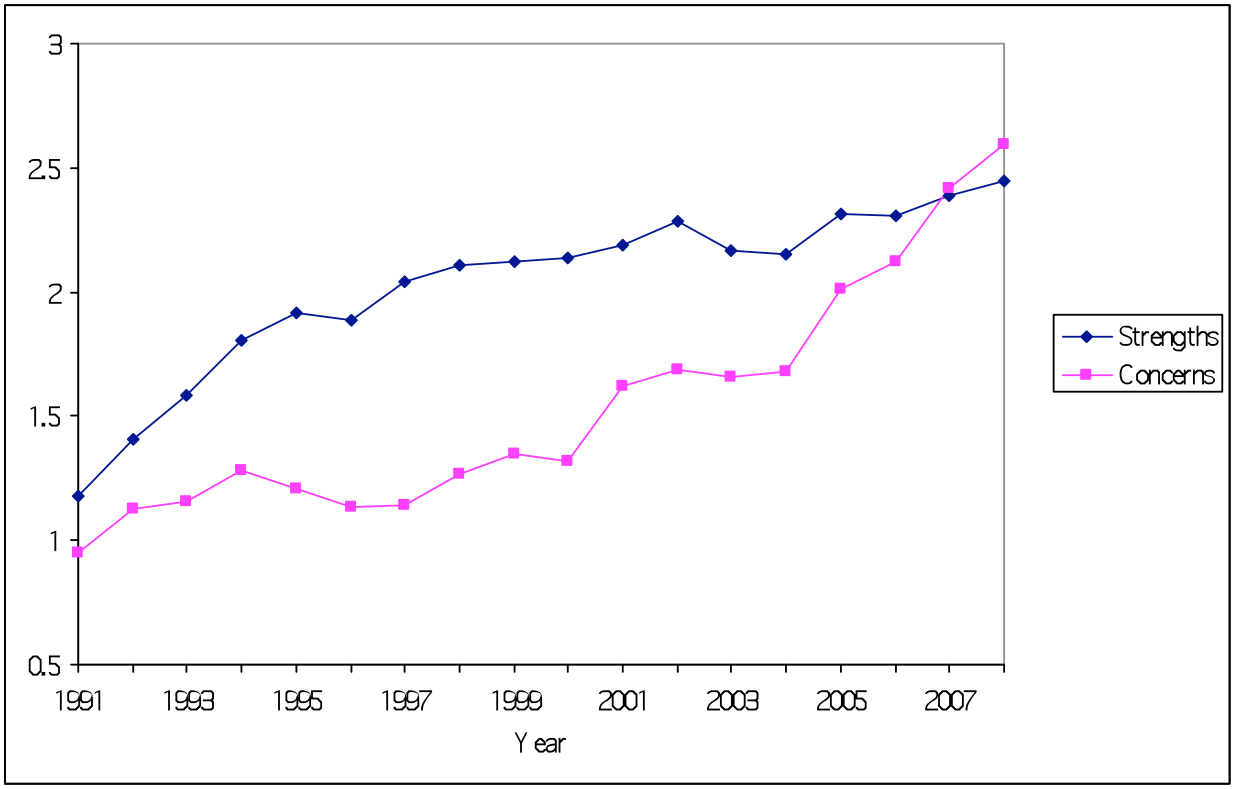

Figure 2: Time Trend of Corporate Goodness

The figure shows the time trend in the yearly average *Raw Goodness* of S&P 500 firms between 1991 and 2008.

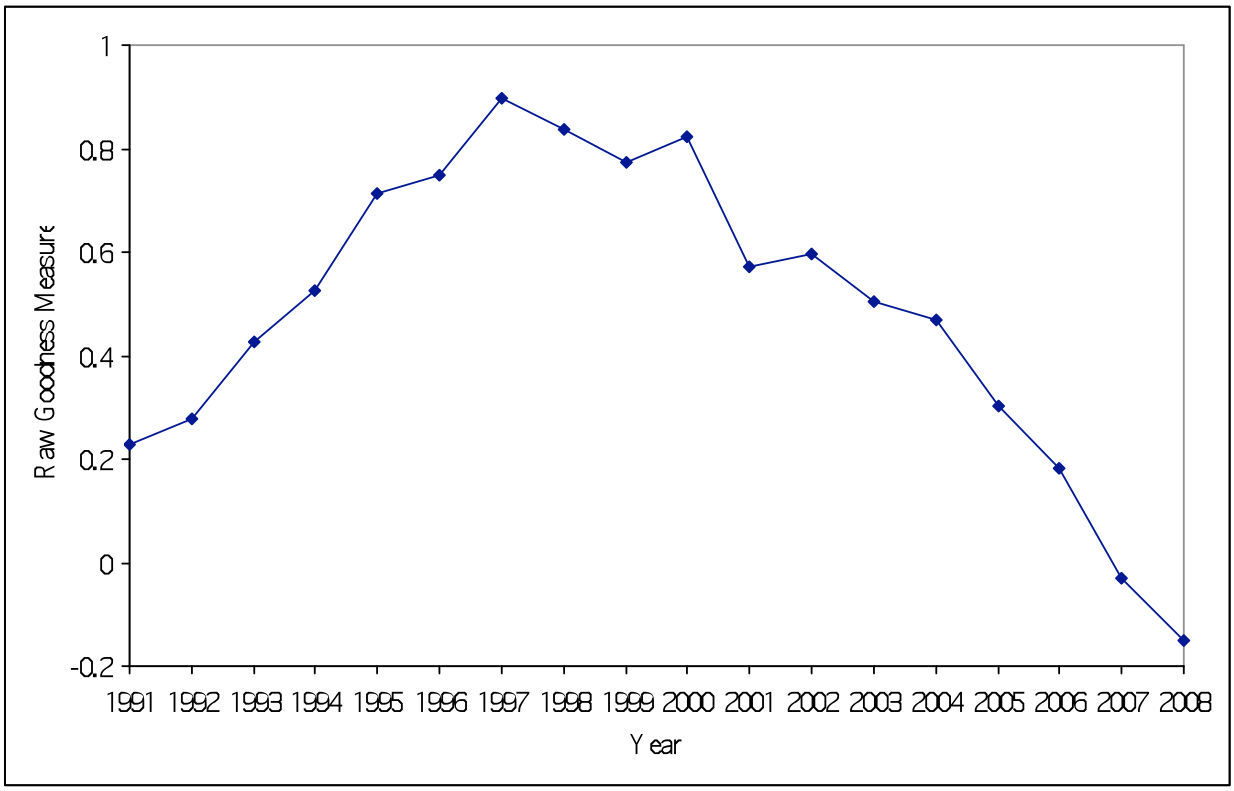

Figure 3: Trends in Average Corporate Goodness by Initial KZ Score

The figure shows the time trend in the yearly average of corporate goodness for two groups of firms. The first group is firms in the bottom half of the *Initial KZ Score* distribution. These are relatively unconstrained firms. The second group is firms in the top half of this distribution; these are relatively constrained firms.

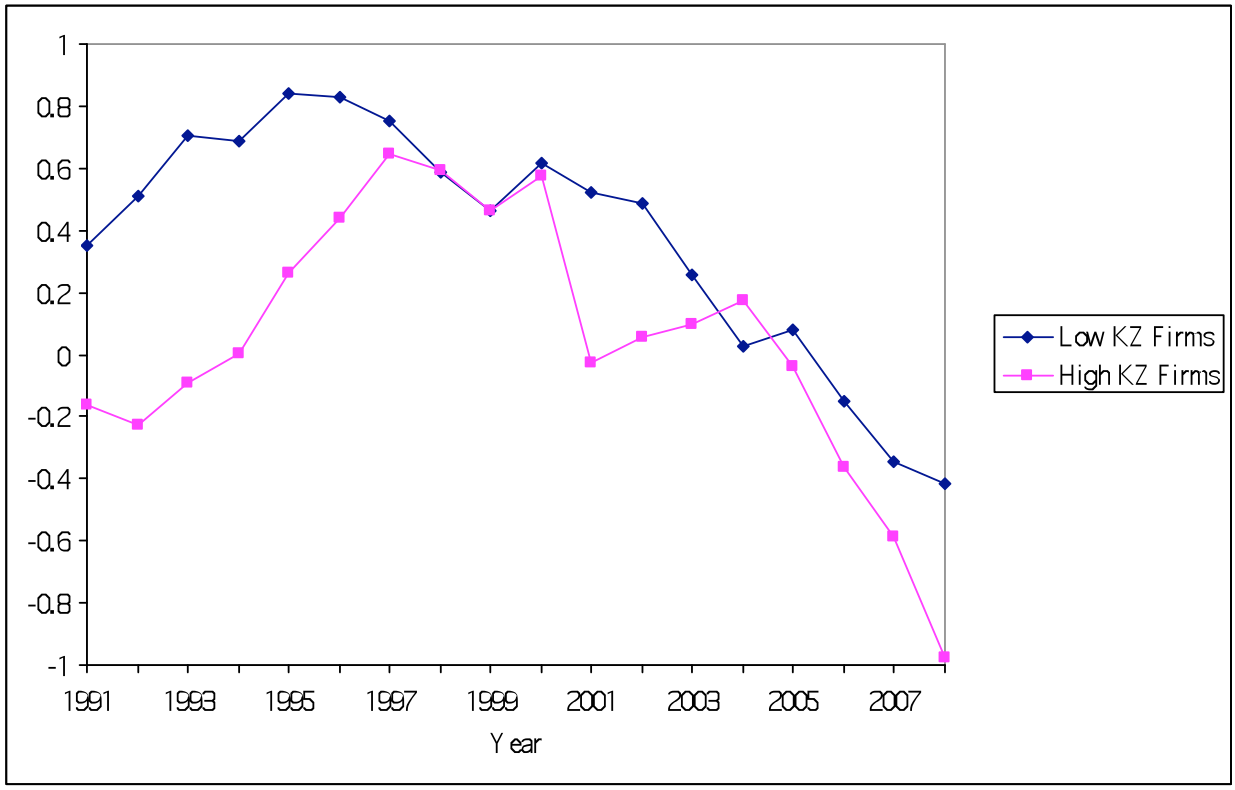

Figure 4: Trends in Average Corporate Goodness by Initial Repurchases

The figure shows the time trend in the yearly average of corporate goodness for two groups of firms. The first group is firms with a value of zero for *Initial No Repurchase Indicator*. These are relatively unconstrained firms. The second group is firms with a value of one for this variable; these are relatively constrained firms.

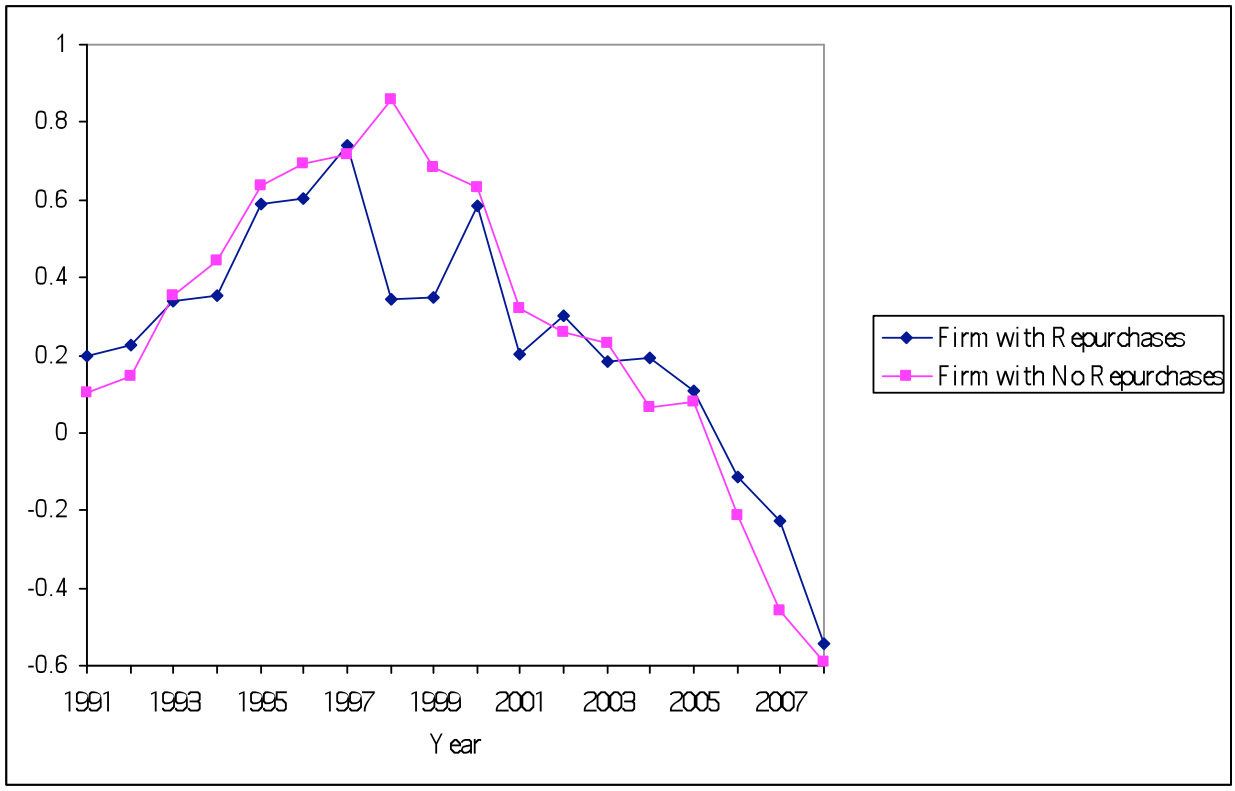

Figure 5: Trends in Average Corporate Goodness by Initial Bond Rating

The figure shows the time trend in the yearly average of corporate goodness for two groups of firms. The first group is firms in the bottom half of the *Initial Bond Rating* distribution. These are relatively unconstrained firms. The second group is firms in the top half of this distribution; these are relatively constrained firms.