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Do Leveraged Firms Underinvest in Corporate Social Responsibility? Evidence from Health and Safety Programs in U.S. Firms

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Abstract The explosion of health-related costs in U.S. firms over more than a decade is a huge concern for managers. The initiation of Health and Safety (H&S) programs at the firm level is an adequate Corporate Social Responsibility (CSR) initiative to contain this evolution. However, in spite of their documented efficiency, firms underinvest in those programs. This appears as a puzzle for health economists. In this paper, we uncover a strong negative relation of financial leverage to the implementation of H&S programs. The negative impact of debt on investment and CSR activities is generally interpreted as an efficient disciplinary effect of debt on managers. H&S are particularly well suited to revisit this evidence, given their strong profitability and homogeneity across firms. Very interestingly, the negative effect is stronger for firms with high free cash flows, for which debt is used to prevent overinvestment. This strongly suggests that debt, while disciplining managers, also discourages investments which are valuable both for firms and society.

Keywords Debt · Investment · Health and safety programs · Corporate Social Responsibility

JEL Classification G32

Introduction

Health and safety (H&S) programs have emerged in the 1980s as a way to improve the health of employees and

control healthcare expenditures paid by the firm. These programs have received considerable attention in the health economics literature. The reviews of Aldana (2001), Goetzel and Ozminkowski (2008) and the meta-analysis of Baicker et al. (2010) reveal the efficiency of those programs, both for improving employees' productivity, and reducing health-related costs for employers. The number of companies reporting a comprehensive program has steadily increased over the last decade, but is still relatively marginal. This appears as a puzzle, given the explosion of health costs borne by employers in the U.S. As Baicker et al. (2010) conclude:

> Understanding the factors that make them most successful and the barriers to their wider adoption could help smooth the path for future investments in this very promising avenue for improving health and productivity.

In this paper, we investigate the relation of capital structure to the adoption of H&S programs. More precisely, our hypothesis is that financial leverage has a detrimental effect on their initiation.

The interaction between investment and financing decisions is not a new idea and dates back to Jensen and Meckling (1976) and Myers (1977). In particular, it is well established empirically that the level of debt has a strong negative impact on the investment policy of firms (capital expenditures, employment, research and development, socially responsible initiatives). In the literature, the general consensus to explain this effect is that debt optimally prevents managers from overinvesting (Lang et al. 1996; Peyer and Shivdasani 2001; Ahn et al. 2006; Chava and Roberts 2008; Barnea and Rubin 2010). This agency perspective revolves around the idea that managers may reap private benefits (compensation, perks, entrenchment,

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prestige…) from firm investments, be they profitable or not. The free cash flow theory of Jensen (1986) therefore views corporate debt as a powerful device to force managers to disgorge free cash flows, i.e., 'cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital.'

On a large sample of U.S. listed firms over the period 2003–2008, we document a strong negative relation between financial leverage and the implementation of H&S programs.[1] This effect is valid for many specifications of our model and robust to the introduction of size and industry control variables. Two specific features of H&S programs make our results particularly insightful. First, they present a strong degree of homogeneity across firms. Second, numerous studies document their exceptional profitability. These characteristics imply that these programs create value and that their return should not vary too much across peer firms of same size and industry. Importantly, the negative relation of leverage to H&S programs is observed in firms with low investment opportunities and high free cash flow. This is precisely the firms for which leverage is supposed to discipline managers according to the agency perspective. Our results, therefore, strongly suggest that the debt pressure acts as a brake on the adoption of H&S programs and that this effect is inefficient.

Alternative theories may explain the interaction between H&S programs and debt. A financial constraint argument is clearly not supported in our data as our effect is driven by the largest and most profitable firms, for which financial constraints are the lowest. From a risk management perspective, H&S investments may be considered as a risk mitigation policy, which increases the debt capacity of firms. This theory, though, is not consistent with the negative relation between debt and H&S programs. The limited liability argument, according to which a high level of debt is associated with a relaxation of risk management practices, is not a credible hypothesis either, given the fact that the relation holds for the most profitable firms.

Lastly, we control for two important variables, which may affect both H&S programs and the level of corporate debt. First, H&S programs are positively correlated to the market-to-book ratio, a proxy for firm investment opportunities. As the latter have a well-documented negative impact on debt, our result could be driven by an omitted growth variable. However, the negative effect of debt is robust to the introduction of a growth control variable and

exists only for low-growth firms. Second, the stakeholder capital structure theory, predicting a negative impact of employee well-being on debt, has recently been supported by Bae et al. (2011), who captured 'Employee Treatment' through the aggregate 'employment' score of the aforementioned rating agency KLD (see footnote 1). As H&S programs are a subfield of the general 'employment' rating provided by KLD, employee well-being could drive the debt/health relation. Nevertheless, the negative effect of debt remains after controlling for the Employee Treatment variable and holds only for firms with no employment 'strengths' (other than H&S). These findings somehow alleviate the omitted variable concerns.

Overall, our findings are hard to reconcile with the traditional explanations of the negative debt to investment relation. The specificities of H&S programs allow us to revisit this important question. In general, the literature considers that leverage is optimally adjusted to the investment opportunity set of firms. Our results show that this is not true for all investments. H&S investments appear to be 'collateral victims' of the disciplinary effect of debt. While preventing managers from overinvesting, debt also discourages certain valuable investments.

In the paper, we also uncover a negative relation of labor mobility and CEO change to H&S programs. This suggests that private incentives at the firm and top management level play a role in the initiation of H&S investments. Our observations appear to be in line with the description of managerial behavior underlying the classical agency model, where managers are driven by self-interest. However, our results on debt discipline and H&S also highlight an inefficiency of the incentives mechanisms proposed by agency theory. This apparent paradox can be resolved using the model of Bøhren (1998), who proposes a revised version of the principal–agent model where 'the agent may be modeled as being egoistic in terms of wealth and effort, but he does not have to be indifferent to honesty issues.' His model provides superior solution to contractual issues than the one derived from a pure agency perspective. The results that H&S programs are less prevalent in leveraged firms can be considered as what he names a 'deadweight loss' associated to the use of purely opportunistic view of managerial behavior.

Our paper also conveys important messages regarding the impact of firms' financial leverage on social welfare. Health is an important public good. More specifically, firms collectively benefit from having healthier employees, both inside the firm and on the job market. This is all the more important in the U.S. that health costs are the highest among developed countries and still largely borne by firms. Corporate H&S programs appear as a simple and very efficient way to improve this public good. Accordingly, they should be considered as a major component of

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[1] The latter variable is captured by the H&S score granted by the extra-financial rating agency KLD.

Corporate Social Responsibility (CSR), and an ethical stance from CEOs would consist in promoting those programs.

Our main result that financial leverage acts as a brake on those programs brings a new perspective on the negative link between debt and CSR, already documented by Barnea and Rubin (2010). In their view, managers derive private benefits from CSR activities, and debt efficiently prevents them from overinvesting in CSR. The specific case of H&S programs is very interesting as both shareholders and society benefit from their initiation at the firm level. Our results, therefore, provide evidence that debt may also induce managers to underinvest in CSR activities.

Lastly, our paper sheds a new light on the association between corporate governance and CSR. Debt discipline is indeed viewed as an important instrument of corporate governance in the agency literature. Jo and Harjoto (2011) document a positive effect of sound corporate governance on CSR, which seems at odds with the findings of Barnea and Rubin (2010) of a negative association between debt and CSR. Consistently with the latter paper, we reveal that debt is negatively associated with H&S. In our perspective, our findings do not conflict with the results of Jo and Harjoto (2011) but support the hypothesis that debt discipline is not a vector of sound corporate governance.

The remainder of the paper is structured as follows. "Economic Analysis of Work Health Programs" section defines occupational health programs in the U.S. and provides an economic analysis of the benefits and costs associated with this type of program. "Sample and Variables Description, Empirical Methodology, and H&S Trends" section describes the sample and variables, empirical methodology and H&S trends. "Presentation and Interpretation of the Results" section presents and discusses the results. "Implications of the Results" section deals with the implications of the results from finance and business ethics perspectives. "Conclusion" section concludes the article.

Economic Analysis of Work Health Programs

Presentation of Work Health Programs in the U.S.

The concept of workplace wellness dates back to the 1970s when occupational H&S initiatives began to emerge. The first wave of programs in the 1980s focused on safety in the workplace and the second wave started in the 1990s, emphasizing lifestyle issues such as fitness, healthy eating, and stress. The current wave of health programs, which launched in the new millennium, integrates a comprehensive approach to wellness (Baker et al. 2002) which includes both workplace safety and health-promotion programs.

The safety programs work by preventing and controlling hazards in the workplace and their associated costs. Firms' safety practices were placed under the supervision of the Occupational Safety and Health Administration (OSHA) when the OSH Act was enacted more than four decades ago. This administration designs safety rules and health standards, whose application at the firm level is enforced through inspections in the workplace and the issuing of penalties, if applicable.

The second form of H&S program (the one we could refer to as a 'health promotion program'), is, by contrast with safety programs, a genuine voluntary corporate investment. Goetzel and Ozminkowski (2008) define this type of program as a set of initiatives aiming at improving the health and well-being of employees, but also at preventing disease and its progression. Three levels of prevention can be identified. The first level provides a set of actions (training, diet, stress management, etc.) designed to maintain the health of employees who do not present a particular risk. The second type of prevention program targets employees presenting a particular risk (obesity, stress, smoking, etc.), and the third type addresses the case of employees with a specific disease (for example, asthma, diabetes, cancer). The principle of these programs is to use the workplace as a place of health promotion, because 'it is for adults what the school is for children', according to the perception of the Center for Disease Control and Prevention in the United States (Goetzel and Ozminkowski 2008, p. 305).

Economic Analysis of H&S Programs

The corporate gains associated with H&S programs are twofold: on the one hand, labor costs are reduced, while on the other hand, employees' 'health capital' is enhanced. Investing in occupational H&S programs can reduce the costs associated with occupational hazards, which take the form of a risk premium for employees (higher wages to compensate for the increased health risk at work), penalties imposed by the OSHA[2] and direct costs due to injuries or accidents (lost days, replacement costs of damaged material, machinery and property, workers' compensation, new employees' learning curve).[3]

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[2] On the effectiveness of the OSHA, Weil (1996) shows that even moderate regulatory pressure (low probability of inspection and moderate penalties moderate) can induce a significant change in employers' behavior.

[3] According to the American Industrial Hygiene Association, firms spend $170 billion a year on workers' compensation associated with occupational illnesses and injuries (OSHA 2012).

Health investment can also reduce the cost of health coverage provided by employers. The explosion of health costs[4] in the early part of the new millennium led firms to decrease health coverage for their employees, with the proportion of firms providing comprehensive health coverage declining from 69 % in 2000 to 60 % in 2005 (Gabel et al. 2005). Large companies have also professionalized the purchase of health insurance policies (Maxwell et al. 2001). Even if health risk coverage is a factor in attracting and retaining human capital, it is likely that employees do not perceive the increased health coverage costs borne by employers as equivalent to an additional wage. More recently, the trend has been to try to shift health coverage costs to employees through cost sharing, co-pays, and deductibles.[5] As employers are very concerned with rising health costs and cannot continue to shift these costs to workers, health initiatives at the firm level increasingly appear as a solution. The growth of diseases linked to modifiable factors (obesity, poor diet, physical inactivity, tobacco, alcohol, stress) over the past decades is another trend that motivates such initiatives.[6]

A second source of benefits related to H&S programs is associated with the enhancement of workers' health capital, because better health implies lower absenteeism and turnover as well as increased productivity.[7] Poor health may also weigh on the productivity of colleagues at work (Goetzel and Ozminkowski 2008), while higher health capital will also induce higher longevity at work, especially in industries with hard working conditions. This increased longevity is all the more valuable that the working population is aging, talent is scarce, and specific human capital is high.

There are thus many benefits associated with H&S programs. Although the profitability of pure 'safety' programs is not documented, a lot of empirical evidence is provided on the profitability of worksite health promotion programs. They are indeed the subject of abundant research trying to assess the value creation potential in terms of healthcare cost reduction, absenteeism, and employee productivity (Aldana 2001). Goetzel and Ozminkowski (2008) provide a survey of studies measuring the cost effectiveness of occupational health programs. The return on investment, estimated at $3 saved for each $1 invested (with estimates ranging from $2.50 to $10), is, however, generated after several years, which therefore requires a long-term horizon and steady efforts over time. In a more recent meta-analysis of thirty-six studies on costs and savings associated with such programs, Baicker et al. (2010) found that medical and absenteeism costs fall respectively by between $3.27 (over a 3-year duration) and $2.73 for every dollar spent on wellness programs.

A generalization of workplace wellness programs among U.S. firms would enhance the health of the U.S. workforce, with numerous positive externalities for society: raising the productivity and purchasing power of the workforce, boosting the competitiveness of U.S. firms, improving the long-term sustainability of the federal budget and increasing the global level of well-being in the U.S. society.

The Barriers to the Adoption of H&S Programs: Invoked Reasons and New Hypothesis

H&S programs appear as an important responsible investment for U.S. firms. The initiation of those programs at the firm level is efficient and their profitability should be a sufficient motivation for their adoption. However, although the value creation associated with H&S programs is high, they remain relatively uncommon among large companies. For instance, regarding health promotion programs, the results of a national survey in the United States, conducted in 2004, revealed that only 6.9 % of companies offer a comprehensive program (Linnan et al. 2008). As we document in the next section, H&S programs have developed regularly over the last decade but are still minor.

Goetzel and Ozminkowski (2008) report a number of reasons given by companies on why they decide not to invest in health programs. First, some companies believe they should not intervene in employees' health because it is private, discriminatory, or outside their scope. Second, some companies argue that employees do not feel concerned with this type of program, as it distracts them from their work. Third, the authors point out that unions frequently oppose such programs, claiming that they are ill-intentioned maneuvers designed to appease pay claims.

Aside those arguments, incentive issues may also be at play. Although the evidence regarding the efficiency of H&S programs is very strong, firms' managers may have economic incentives not to adopt them.

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[4] From 2000 to 2005, insurance premiums paid by firms increased by over 10 % per year (Gabel et al. 2005). In 2006, the average premium paid by an employer was $4,024 for single coverage and $10,880 for family coverage. As the next footnote reports, between 2005 and 2011, health coverage costs more than doubled in real terms, reaching more than 10 % of overall compensation costs.

[5] Chasan reports in the *Wall Street Journal* (*CFO Journal*, June 29, 2011) the results of various studies: "At U.S. companies with at least 1,000 employees, total healthcare costs [have reached] $11,176 per active employee in 2011, with workers paying about 24 % of the premiums", according to an earlier study from consulting firm Towers Watson […] According to another survey (Financial Executive Research Foundation), 88 % of companies declare they are sharing health costs with employees. The same survey reports health costs making up more than 10 % of the overall compensation costs.

[6] Goetzel et al. (1998) documented that illnesses related to modifiable factors represent 25 % of employers' healthcare expenses.

[7] Goetzel et al. (2004) provide a precise assessment of these benefits for ten diseases.

First, employee turnover may be a major issue. At a macroeconomic level, every manager would benefit from a labor market with healthier employees. However, private incentives at the firm level may conflict with the provision of this public good. When an employee moves to another job, the benefits of his better health accrue to his new employer. If the turnover rate is extreme, launching an H&S program may hence prove unprofitable. However, even in this case, a solution could be to target employees with a long horizon in the firm. In this regard, Burgess et al. (2000) show that there is an important stable core of workers within firms.[8]

Second, anecdotal evidence suggests that the horizon of managers weighs negatively on the decision to adopt an H&S program. The long-term payback of H&S investments and the difficulty in precisely estimating their associated streams of cash flows are frequently invoked to explain the lack of H&S initiatives. According to a survey of financial executives (Thompson and Turner 2011), among the companies that have chosen not to offer any H&S programs, 23 % say that they 'don't want to spend money upfront to start a program.' This quote, from the CFO of the Aerospace Corporation, is revealing:

> We are very similar to the government when it comes to ROI. We look at return for next year. Long-term investments (three to five years), I cannot see it. I can see ROI in three years or so with wellness programs as an example, but it will be a tough sell to the Executive Council.

Managers' position regarding H&S programs appears contradictory. They are concerned with health-related costs and aware of the returns attached to those programs. However, they seem reluctant to initiate them in practice. This short term bias is likely to increase when the CEO is about to leave the firm, as he will not benefit from the long-term effects of H&S programs. In addition, H&S programs decrease current profits, which may be detrimental to the manager's value on the job market.

In this paper, we are interested in the way financial leverage may affect managers' behavior toward H&S programs. We know from the corporate finance literature that debt has a negative impact on many forms of investment. The empirical literature generally interprets this impact as a validation of the free-cash flow theory, according to which debt prevents managers from overinvesting (see Parsons and Titman 2009 for a review). H&S programs are particularly well suited to revisit the debt-

investment relation, given their highly documented profitability. Our hypothesis is that, while preventing managers from overinvesting, debt may also discourage important valuable investments.

Sample and Variables Description, Empirical Methodology, and H&S Trends

Definition of the H&S Variable and Sample Construction

The information on the existence of H&S programs is provided by KLD Research & Analytics Inc. since 2003. Before 2009, KLD was the leading U.S. extra-financial rating agency, providing yearly ratings on the behavior of Russell 3000 U.S. firms toward social, environmental, and governance issues. We decided to restrict our study to the period 2003–2008 due to the change in the methodology brought by the acquisition of KLD by RiskMetrics and the subsequent 2010 sale of RMG to MSCI. Firms are rated in seven areas, among which is an 'employment relation' category, including an H&S rating. This rating assigns a grade of 1 to a firm having 'strong health and safety programs' and 0 otherwise.

A few observations on KLD rating methodology are in order. KLD ratings are more objective than self-reported CSR activities because they rely on external expert assessments. Indeed, KLD assigns yearly ratings based on a wide variety of data sources, including company filings, government data, non-government organization data, general media sources, and direct communications with company officers. The issue of how well social ratings actually measure past and predict future CSR activity has received a deserved attention in the literature. Chatterji et al. (2009) found that KLD environmental ratings are well correlated to past environmental performance, but the explanatory power of KLD's ratings on future emissions and penalties is far lower than the explanatory power of lagged emissions and penalties, implying that KLD ratings are confounded by subjective judgments and do not optimally make use of all the information available. Another potential limitation of KLD ratings is the use of binary 0/1 ratings (instead of a continuous scale) for each rated CSR strength or weakness. However, these limitations do not apply in our case. Indeed, H&S programs are quite standardized across firms and the variable of interest for our study is the existence or not of H&S programs, information provided by KLD.

The examination of our sample reveals a low percentage of companies implementing comprehensive health programs (around 4 %), consistent with the studies cited above. Figures 1, 2, and 3 reveal the slow but steady pace of program development from 2004 to 2006, with marked

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[8] The authors find on a large employer-level panel dataset from the universe of Maryland quarterly wage Reports that 42 % of workers were still employed by the same employer after 9 years in nonmanufacturing, 32 % in manufacturing.
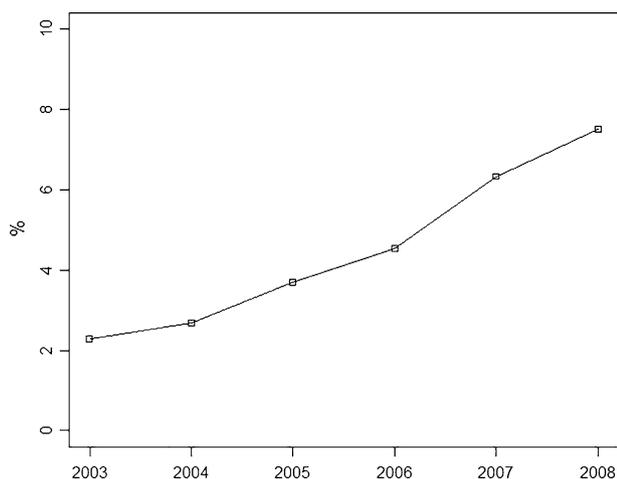
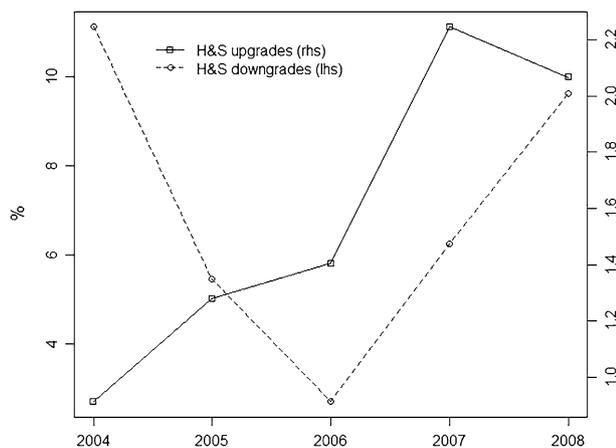**Fig. 1** % of firms receiving a KLD H&S ratings of 1 from 2003 to 2008

Fig. 2 Frequency of H&S upgrades (right-hand scale) and downgrades (left-hand scale) in % from 2004 to 2008
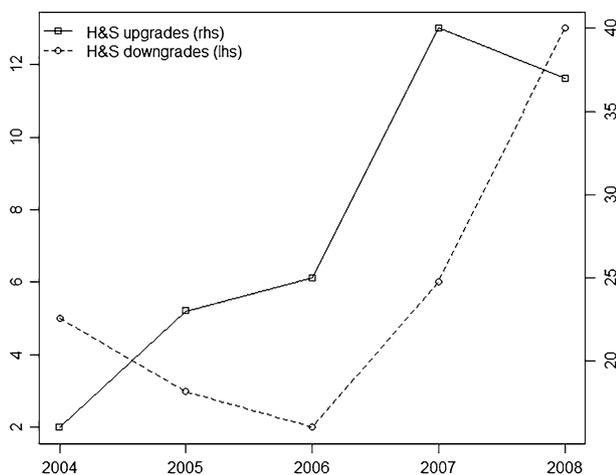

Fig. 3 Number of H&S upgrades and downgrades from 2004 to 2008

acceleration after 2006. The average annual probability of a downgrade is only 8.7 % over the period, which is consistent with the long-term horizon of H&S programs. As expected, H&S programs also present stark industrial contrasts (Table 1). They are more frequent in large firms as we uncover from our sample that 8.4 % of firms with a size above the median receive a rating equal to 1 against less than 0.3 % for smaller ones. This may be due to the existence of fixed costs associated with H&S programs, or to a higher awareness among larger firms. These stylized facts provide important guidance regarding model specification and the choice of control variables. In particular, time, industry, and firm size effects have to be controlled for in our regressions.

The availability of our H&S variable determines the construction of our initial sample. It includes the 4,812 listed U.S. firms that received an H&S program rating from KLD between 2003 and 2008. The total number of firm-year observations is 17,834. For other firm-level data, we use Worldscope.[9] We collect information on all non-financial firms rated by KLD during the years 2003–2008, and we trim financial variables by removing outliers at the 1 and 99 % percentiles. Finally, we remove all firm-year observations with at least one missing observation in a financial variable, which results in an unbalanced panel of 11,934 firm-year observations and 2,991 firms. For labor mobility and CEO change, we use the number of firms' employees (also obtained from Worldscope and trimmed at the 1 and 99 % levels to remove outliers) and the names of firms' CEOs (extracted from the Boardex database[10]). Employment flow, defined as the absolute value of employment growth over the recent year, is a proxy for worker turnover, as there is a documented U-shaped relationship between workers' flows and firm's employee growth. A labor force contraction naturally entails a higher turnover rate as a result of the layoff policy, while an increase in the labor force is associated with higher subsequent quit rates, due to uncertain match value in the newly employed group of workers (see Burgess et al. 2000 and Davis et al. 2006). This worker turnover proxy is also trimmed at the 99 % level to remove outliers. CEO mobility is measured by means of a dummy variable, which equals 1 if the CEO leaves the firm during the subsequent year. We obtain 5,946 firm-year observations of the complete set of variables (including employee and CEO mobility), corresponding to a panel of 1,454 firms. Descriptive statistics are provided in Table 2.

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[9] The Worldscope database is a major source of detailed financial statements data. It contains complete coverage of U.S. companies filing with the Securities Exchange Commission, with the exception of close end funds.

[10] The Boardex database contains biographical information of senior executives and board directors of firms around the word.

Table 1 Industry characteristics

	H&S (%)	Obs. (%)		H&S (%)	Obs. (%)
Aircraft	36	116	Electronic equipment	3	1,118
Chemicals	28	343	Recreation	2	100
Business supplies	18	189	Pharmaceutical products	2	778
Shipping containers	17	61	Wholesale	2	540
Tobacco products	14	23	Construction	2	211
Beer and liquor	12	31	Electrical equipment	2	205
Non-metallic and industrial metal mining	12	63	Retail	1	954
Construction materials	11	221	Business services	1	1,138
Textiles	10	34	Medical equipment	1	485
Other	9	95	Measuring and control equipment	1	345
Petroleum and natural gas	9	700	Printing and publishing	1	191
Candy and soda	8	91	Computer software	0	968
Utilities	8	737	Restaurants, hotels, motels	0	332
Steel works etc.	8	209	Agriculture	0	43
Machinery	7	554	Entertainment	0	152
Food products	7	203	Apparel	0	146
Precious metals	7	40	Healthcare	0	279
Automobiles and trucks	6	223	Fabricated products	0	30
Transportation	5	420	Shipbuilding, railroad equipment	0	25
Coal	5	48	Defense	0	30
Computer hardware	5	257	Communication	0	497
Consumer goods	4	268	Personal services	0	196
Rubber and plastic products	4	63			

This table reports the average H&S KLD ratings for non-financial industries determined at level 2 of the SIC codes. The total number of firm-year observations is displayed for each industry

Empirical Methodology

The first empirical model that we consider is a logit model relating the probability of observing a KLD H&S rating of 1 to the level of debt and several control variables. The specification of the model is:

$$
Y_{i,t} = \ln\left[\frac{P(Y_{i,t} = 1)}{1 - P(Y_{i,t} = 1)}\right]
$$
$$
= \alpha + \beta_1 Debt_{i,t} + \sum_j \beta_2^j X_{i,t}^j + \beta_3 Labor\ Mobility
$$
$$
+ \beta_4 CEO\ change + \beta_5 Size_{i,t} + \beta_6 Industry_s
$$
$$
+ \beta_7 Year_t, \tag{1}
$$

where $Y_{i,t}$ is a binary variable with value 1 if firm i receives an H&S rating equal to 1 at year t, $Debt_{i,t}$ is the measure of leverage (total debt/total assets),[11] $(X)_{it}$ is a vector of control variables at the firm level, $Size_{i,t}$ is the logarithm of total assets, $Year_t$ is a year dummy variable and $Industry_s$ is an industry dummy at level 2 of the SIC code (Fama–French industry classification).

Apart from firm size, the other control variables at the firm level are:

- *Profitability*, defined by the ratio EBITDA/Total Assets, which is a measure of operating performance;
- *Market-to-Book*, defined as (market capitalization + total debt)/(book value of equity + total debt), which is our proxy for the level of investment opportunities of the firm;
- *Employee Treatment*, which is a variable adding the six employment strengths assigned by KLD alongside H&S strength (union relations, no layoff policy, cash profit-sharing, employee involvement, retirement benefit, and finally a field called 'other strengths');
- *Labor Mobility*, defined as the absolute value of the growth rate of the number of employees between $t - 1$ and t[12];
- *CEO Change*, which is a dummy variable equal to 1 if there is a change of CEO between t and $t + 1$.

We propose an additional specification in order to control for omitted variables at the firm level. The estimation of a standard fixed-effects model is problematic within a logit specification, due to the high number of parameters to be estimated. Therefore, we estimate instead a dynamic logit model, regressing the decision to launch an H&S program on prior debt dynamics, while controlling for other variables. The specification of the model is:

$$
\ln\left[\frac{P(\hat{Y}_{i,t} = 1)}{1 - P(\hat{Y}_{i,t} = 1)}\right] = \alpha + \beta_1 (Debt_{i,t} - Debt_{i,t-n})
$$
$$
+ \sum_j \beta_2^j (X_{i,t}^j - X_{i,t-n}^j)
$$
$$
+ \beta_3 Labor\ Mobility
$$
$$
+ \beta_4 CEO\ change + \beta_5 Size_{i,t}
$$
$$
+ \beta_6 Year_t, \tag{2}
$$

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[11] Our results are unchanged when we replace the book value of total assets by its market value, which is obtained by adding the difference between the market and book value of equity to total assets.

[12] Our results are robust to the use of different time horizons to define labor mobility (e.g., the absolute value of the growth rate of the number of employees between $t - 2$ and t).

Table 2 Summary statistics

	Number of observations	Mean	Median	SD	Min	Max	Number of obs. equal to 1
H&S	11,934	0.04	–	–	0.00	1.00	516
Book Leverage (%)	11,934	20.84	18.71	18.96	0.00	89.57	–
Profitability (%)	11,934	3.23	5.09	12.48	−71.81	31.32	–
Market to Book	11,934	2.53	1.96	1.76	0.67	13.30	–
Size	11,934	6.96	6.78	1.52	3.83	11.04	–
Employee Treatment	11,934	0.20	0.00	0.50	0.00	4.00	–
Labor Mobility	9,669	0.15	0.077	0.22	0	1.94	–
CEO Change	8,391	0.11	–	–	0.00	1.00	886

This table reports the descriptive statistics of firm-level variables. The sample includes firms covered by the KLD Research & Analytics database, observed between 2003 and 2008. H&S is a dummy variable taking the value of 1 for firms having a strong health and safety program. Book leverage refers to the ratio of the book value of total debt to the book value of total assets. Profitability is the ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) to the book value of total assets. Market-to-book is the ratio (market value of equity + total debt)/(book value of equity + total debt). Size is the natural logarithm of the book value of assets. The Employee Treatment variable corresponds to the sum of KLD strengths in the KLD 'Employment relations' field, excluding H&S (union relations, no layoff policy, cash profit-sharing, employee involvement, retirement benefit, and finally a field called 'other strengths'). Labor mobility is the absolute value of the employment growth rate over the previous year. CEO change is a dummy which equals 1 if the CEO leaves the firm during the subsequent year

In model (2), $\hat{Y}_{i,t}$ is a binary variable that equals 1 (resp. 0), if firm i has a null H&S rating at $t - n$ and acquires a rating of 1 (resp. keeps a null rating) at t. A firm with a rating of 1 at one of the n previous dates does not enter the sample, as our interest lies in the upgrading process in this setting.

$Debt_{i,t} - Debt_{i,t-n}$ and $X_{i,t}^j - X_{i,t-n}^j$ represent the respective variations of book leverage and control variables (profitability, market-to-book, employee treatment) between time $t - n$ and time t. *Labor Mobility* and *CEO Change* already represent variations over time and are, therefore, left unchanged.

Horizons of 1 and 2 years are successively tested, as debt variations could have a deferred impact on health and the KLD upgrading event may intervene with a lag to the firm's decision to launch a new H&S program. The size variable is also included in the regression, as the upgrading probability is highly sensitive to the firm's size (this probability is 3 % for firms with a size above the sample median and 0.2 % otherwise). However, the 48 industry dummies are not included in this specification because this would lead to a risk of over-fitting given the relatively low number of upgrading events (133 and 111 ratings changes for the 1- and 2-year horizon models, respectively).

Presentation and Interpretation of the Results

Presentation of the Results

The results from the first model (1) are reported in Table 3.

In line with our hypothesis, the existence of an H&S program is negatively associated with the level of debt in all the model specifications. The economic significance of the relation is strong, as a decrease in leverage by one standard deviation[13] increases the odds of running an H&S program by around 40 %. The market-to-book ratio and the employee treatment variable are both positively related to the likelihood of running H&S programs. By contrast, H&S is weakly related to the firm's profitability. Interestingly, labor and CEO mobility are both negatively associated to the existence of a program, although only labor mobility is significant in this specification.

The results of the dynamic model are presented in Table 4.

Debt variation is not significantly related to H&S upgrades when measured on a horizon of 1 year, but it does enter with a significant negative sign when measured on a 2 years horizon, which may be due to a deferred impact of debt or a lag between the decision to launch a program and the timing of the upgrading event in the KLD base. The relation to leverage dynamics is almost unchanged after the introduction of the operating performance, market-to-book, employee treatment, labor mobility, and CEO change variables, thus confirming its robustness. The economic significance of the relation is still important, as a 10-point decrease in the ratio of total debt to total assets—a little more than a one standard deviation change—increases (everything else equal) the probability of launching a strong H&S program by around 25 %. The negative labor mobility effect is again found but is only significant when introduced alone, while the CEO change enters significantly in both cases. The latter effect is economically important as a change of CEO in the subsequent year more

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[13] The standard deviation of total debt to total assets is around 19 % in the global sample.

Table 3 Pooled-logit regressions explaining the existence of H&S programs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Book Leverage	−0.021*** (0.0042)						−0.017*** (0.0045)	−0.017*** (0.0055)
Profitability		0.015* (0.0077)					−0.0057 (0.0078)	−0.0047 (0.0078)
Market-to-book			0.16*** (0.039)				0.15*** (0.0045)	0.068 (0.0056)
Employee Treatment				0.27*** (0.076)			0.20*** (0.078)	0.10 (0.086)
Labor Mobility					−1.28*** (0.39)			−0.81** (0.40)
CEO Change						−0.15 (0.21)		−0.16 (0.21)
Size	1.22*** (0.049)	1.20*** (0.049)	1.20*** (0.048)	1.16*** (0.050)	1.17*** (0.053)	1.15*** (0.060)	1.19** (0.050)	1.19** (0.050)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	11,934	11,934	11,934	11,934	8,765	5,946	11,934	5,946
Pseudo-R^2	0.42	0.41	0.41	0.41	0.38	0.35	0.42	0.36

This table reports the pooled-logit regression of H&S ratings to financial leverage and other control variables. Book Leverage represents the ratio of the book value of total debt to total assets. Profitability is the ratio of EBITDA to total assets. Market-to-book is the ratio (market value of equity + total debt)/(book value of equity + total debt). Employee Treatment is the sum of all employment strengths, excluding H&S. Labor Mobility is the absolute value of the employment growth rate between $t − 1$ and t. CEO Change is a dummy which equals 1 if the CEO leaves the firm between t and $t + 1$. Size is the natural logarithm of total assets. Forty-eight sector dummies and 5 year dummies are included in the eight specifications. The standard error is reported in parentheses below the regression coefficient. The significance is indicated to the right of the coefficient (*** significant at 1 %, ** significant at 5 %, * significant at 10 %). The pseudo-R^2 is calculated by using the McFadden ($1 −$ log likelihood/log likelihood of the model with only a constant) method

than halves the probability of launching a new program. The effect is not uncovered in the static specification. This difference of result between both specifications may be explained by the fact that the static specification takes into account existing programs, which were possibly launched before year t. In this regard, the dynamic specification is more appropriate to assess the role of CEO change. This result is important as it confirms the role of top management horizon and incentives in the initiation of H&S programs.

Several theories may provide an explanation for the adjustment of leverage to firm characteristics related to H&S programs. We successively consider the risk management, financial constraint, underinvestment, 'stakeholder' and free cash flow hypotheses. In order to disentangle the different hypotheses, we provide additional tests based on the split of our sample along certain firms' characteristics. Consistent with our intuition, a revised version of the 'free cash flow theory' appears as the sole possible explanation of our results among those hypotheses.

The Risk Management Hypothesis

H&S investments may be considered a way to limit H&S hazards. Alongside this perspective, and for non-extreme levels of debt, stricter risk management policies allow for an increase in a firm's debt capacity (Stulz 1996). Given the robust negative relation between H&S policy and leverage, a risk management perspective does not offer any guidance. Our main result might seem at odds with Filer and Golbe's (2003) observation of a positive relation between workplace safety and debt for firms with low operating performance, which validates the risk management hypothesis. However, the period of analysis in Filer and Golbe's (2003) work is the 1970s and 1980s, when H&S programs only focused on safety issues. Conversely, during our recent period of study, firms adopt a more integrated approach to H&S programs. Second, the authors use OSHA violations as their proxy for safety investments, which is not a direct measure of H&S programs.

Limited shareholder liability tends to reverse the relation between risk management and leverage when the risk of bankruptcy is high. Evidence of this effect was provided by Rose (1990) and Dionne et al. (1997) in the case of airline safety incidents. In order to test whether this effect may explain our results, we split the sample by level of profitability. The effect of leverage is more pronounced for the group of highly profitable firms, for which the probability of bankruptcy is lower, everything else equal (Table 5). This result is clearly at odds with what the limited liability argument predicts. Overall, the risk management approach does

Table 4 Logit regression explaining the implementation of new H&S programs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Delta Book Leverage $t-1$ to t	−0.021 (0.013)								
Delta Book Leverage $t-2$ to t		−0.026** (0.011)						−0.024** (0.011)	−0.026** (0.012)
Delta Profitability $t-2$ to t			0.0078 (0.012)					−0.0040 (0.013)	−0.0086 (0.015)
Delta Market-to-book $t-2$ to t				0.19* (0.10)				0.16 (0.10)	0.26** (0.12)
Delta Employee Treatment $t-2$ to t					0.13 (0.20)			0.14 (0.83)	0.084 (0.22)
Labor Mobility						−1.51** (0.74)			−0.89 (0.74)
CEO Change							−0.91* (0.52)		−0.88* (0.52)
Size	0.88*** (0.066)	0.83*** (0.073)	0.83*** (0.073)	0.83*** (0.073)	0.83*** (0.073)	0.81*** (0.075)	0.77*** (0.084)	0.83*** (0.073)	0.77*** (0.084)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	8,362	5,894	5,894	5,894	5,894	5,405	3,746	5,894	3,746
Pseudo-R^2	0.16	0.15	0.14	0.14	0.14	0.14	0.12	0.15	0.13

This table reports logit regressions relating KLD H&S upgrades to the prior variations of certain firm characteristics. The sample for regression 1 (resp. regressions 2–4) includes all firm-year observations with a null H&S rating at $t-1$ (resp. at $t-1$ and $t-2$) and whose H&S rating is available at t. The dependent variable equals 1 (resp. 0) if the KLD H&S rating jumps from 0 to 1 (resp. stays at 0) between $t-1$ and t. The variations are measured on a horizon of 1 or 2 years before the observation date. The Book Leverage, Profitability, Market-to-book, Employee Treatment, Labor Mobility, CEO Change, Size and 48 sector dummy variables are defined as in Table 3 and the same conventions are taken for standard errors, significance and pseudo-R^2

not offer any explanation for the negative relation between debt and H&S we have uncovered.

The Financial Constraint Hypothesis

A simple financial constraint argument could explain our main result. The negative link between H&S investments and financial leverage is consistent with the fact that intangible investments sustain less external financing for financially constrained firms (Almeida et al. 2011). Nevertheless, two empirical results do not fit with this explanation. First, financing frictions decrease with the operating performance of firms, as stronger cash flows make internal financing available to the firm. As documented previously, we find that the negative relation between H&S and debt is driven by the most profitable firms in the sample, so this first result is clearly inconsistent with the financial constraint argument. Second, as Table 5 reveals, the result only holds for the firms with a size above the median, which is also at odds with the financial constraint explanation as larger firms tend to be less constrained (Whited and Wu 2006; Hadlock and Pierce 2010). As such, the financial constraint explanation is overall very difficult to reconcile with our results and can therefore be rejected.

The Underinvestment and Omitted Growth Variable Hypotheses

H&S investments are associated with the investment opportunity set of firms, given their strong positive relation to the market-to-book ratio (Table 3). The underinvestment theory predicts that the agency conflict between shareholders and creditors in indebted firms may result in the abandonment of profitable projects: if the benefits of certain profitable investments accrue to debt holders instead of shareholders, shareholders may want to limit them and instead cash-in a dividend (Myers 1977). However, this framework is of little relevance in the present case: given the difficulty of predicting ex-ante a precise pattern to the cash outflows and inflows related to H&S, a strategic behavior of shareholders toward creditors seems a priori difficult to implement.

A different issue also related to the underinvestment hypothesis could be the omission of the growth variable. Bearing in mind that shareholders adjust their leverage to the level of investment opportunities (Myers 1977; Smith and Watts 1992), and that H&S is related to the latest, poor growth control could drive the relation between debt and H&S programs. To alleviate this concern, we remark that

Table 5 Test of alternative hypotheses (static specification)

	Test of the financial constraints and limited liability hypotheses		Test of the financial constraints hypothesis		Test of the free-cash flow hypothesis	
	Low profitability (1)	High profitability (2)	Low size (3)	High size (4)	Low market-to-book (5)	High market-to-book (6)
Book Leverage	−0.012* (0.0063)	−0.022*** (0.0072)	−0.0018 (0.017)	−0.021*** (0.0048)	−0.018*** (0.0059)	−0.013* (0.0078)
Size	1.24*** (0.084)	1.18*** (0.067)	0.21 (0.55)	1.17*** (0.060)	1.19*** (0.071)	1.22*** (0.078)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	5,967	5,967	5,967	5,967	5,967	5,967
Pseudo-R^2	0.45	0.43	0.54	0.34	0.40	0.48

	Test of the free-cash flow hypothesis		Test of the stakeholder capital structure theory	
	Low free cash flow (7)	High free cash flow (8)	Employee treatment = 0 (9)	Employee treatment > 0 (10)
Book Leverage	−0.015*** (0.0049)	−0.035*** (0.013)	−0.018*** (0.0061)	−0.012 (0.0074)
Size	1.12*** (0.057)	1.25*** (0.12)	1.34*** (0.068)	1.04*** (0.087)
Sector dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Obs.	10,061	1,873	10,000	1,934
Pseudo-R^2	0.43	0.46	0.45	0.37

This table presents the results of regressions of type 1 (static specification) on 10 subsamples defined by different firm characteristics. In each model, we regress the year − t H&S ratings on the year − t book leverage, profitability, market-to-book, employee treatment and size. Only the leverage and size coefficients are reported, however, for the sake of brevity. In regressions 1–6, the cutoff point is the sample median (with the splitting criterion reported on top of the column). In regressions 7–8, we define 'high free cash flow firms' as firms whose profitability is above and market-to-book below the sample median, while we define other firms as 'low free cash flow firms.' In regressions 9–10, the split is made between firms with a null employment treatment score and firms with a positive employee treatment score. Forty-eight sector dummies and five year dummies are included in the eight specifications. The standard error is reported in parentheses below the regression coefficient. The significance is indicated to the right of the coefficient (*** significant at 1 %, ** significant at 5 %, * significant at 10 %). The pseudo-R^2 is calculated by using the McFadden (1 − log likelihood/log likelihood of the model with only a constant) method

the relation holds after introducing the market-to-book, which is a proxy for growth opportunities (Tables 3, 4).

The Stakeholder Capital Structure Hypothesis

The stakeholder capital structure hypothesis (Titman 1984; Cornell and Shapiro 1987; Maksimovic and Titman 2001) contends that the level of leverage is adjusted to protect the implicit and explicit valuable contracts that bind the firm with its various stakeholders (customers, employees, suppliers). This theory is supported by Bae et al. (2011) for employment relations. By measuring 'employee treatment' as cumulative employment strengths (as rated by KLD), the authors uncovered a robust negative relation between leverage and employee treatment and provided strong evidence in favor of the stakeholder theory of capital structure. As H&S programs are one dimension of employment strengths, one could interpret our results as being in line with the stakeholder capital structure theory.

In order to test this hypothesis, we split the sample using our Employee Treatment variable, defined previously as the sum of employment strengths rated by KLD, except the

H&S ratings. In total, 10,000 observations display no strength and represent our low 'employee treatment' group. The results of the regressions are reported in Table 5 and reveal that they are driven by the low treatment group. Hence, the link between leverage and H&S policy cannot be thought of as flowing from the more general relation between debt and employee treatment documented in Bae et al. (2011).

The Free Cash Flow Hypothesis

In the free cash flow theory (Jensen 1986), debt serves as a hard device to disgorge free cash flows, i.e., cash flows in excess of what is needed by a company to finance profitable investments. In this perspective, managers reap private benefits investing in projects that are value-destroying for shareholders. Those benefits may take several forms, monetary or not. In the case of H&S programs, one could argue that managers derive benefits from appearing 'good citizens' or from colluding with employees in order to carry out an entrenchment strategy. Barnea and Rubin (2010) reason along these lines when they interpret the

Table 6 Test of the free cash flow hypothesis (dynamic specification)

	Low free cash flow One-year prior variation (1)	High free cash flow One-year prior variation (2)	Low free cash flow Two-year prior variation (3)	High free cash flow Two-year prior variation (4)
Delta Book Leverage	−0.015 (0.015)	−0.048* (0.029)	−0.019 (0.012)	−0.040* (0.023)
Delta Profitability	−0.00024 (0.015)	0.0070 (0.040)	−0.0057 (0.014)	−0.0034 (0.042)
Delta Market-to-book	0.12 (0.13)	−0.11 (0.41)	0.18* (0.11)	0.059 (0.38)
Delta Employee Treatment	0.12 (0.26)	−0.68 (0.59)	0.89 (0.081)	0.49 (0.52)
Size	0.92*** (0.074)	0.65*** (0.16)	0.89*** (0.082)	0.53*** (0.19)
Year dummies	Yes	Yes	Yes	Yes
Obs.	7,156	1,206	5,065	829
Pseudo-R^2	0.18	0.10	0.17	0.09

This table presents the results of regressions of type (2) (dynamic specification) on two subsamples defined by the level of free cash flows. In each case, we regress KLD H&S upgrades on prior variations of certain firm characteristics. The sample for regressions 1 and 2 (resp. regressions 3 and 4) includes all firm-year observations with a null H&S rating at $t-1$ (resp. at $t-1$ and $t-2$) and whose H&S rating is available at t. The dependent variable equals 1 (resp. 0) if the KLD H&S rating jumps from 0 to 1 (resp. stays at 0) between $t-1$ and t. In regressions 1 and 2 (resp. 3 and 4), the variations are measured on a horizon of 1 year (resp. 2 years) before the observation date. We define 'high free cash flow firms' as firms whose profitability is above and market-to-book below the sample median at time t, while we define other firms as 'low free cash flow firms.' The standard error is reported in parentheses below the regression coefficient. The significance is indicated to the right of the coefficient (*** significant at 1 %, ** significant at 5 %, * significant at 10 %). The pseudo-R^2 is calculated by using the McFadden ($1-$ log likelihood/log likelihood of the model with only a constant) method

negative relation of leverage and insider ownership to the firm's social ratings, thus supporting the hypothesis that 'insiders induce firms to over-invest in CSR when they bear little of the cost of doing so.' Surroca and Tribo (2008) also suggest this possibility by observing that 'the combination of managerial entrenchment strategies and the implementation of socially responsible actions have particularly negative effects on financial performance.'

With the interest tax shield, the disciplinary effect is the other main benefit of debt in the financial literature. Notably, the negative relation between debt and investment encountered in the empirical literature is interpreted as the evidence of the existence of this disciplinary use of debt. In order to determine whether the free cash flow explanation drives the result, we separately analyze the relation of H&S to debt in different subsamples of firms defined by the level of market-to-book and free cash flows. High free cash flow firms are defined as the group of firms with profitability above the median and market-to-book ratio below the median. As Table 5 reveals, the result holds in all four groups, but the debt to H&S relation is higher in low growth firms than in high growth firms and peaks for the firms with high free cash flows. For this latter group, an increase of the debt level by one standard deviation nearly halves the probability of observing an H&S program. The results of Table 6 show a similar behavior within the dynamic specification: a 10-point increase in the ratio of total debt to total assets (a bit more than the standard deviation of the 1-year debt level variation) reduces the probability of implementing a new H&S program by 40 % in the group of firms with high free cash flows (the relation

being insignificant otherwise). At first glance, these results seem to be consistent with the free cash flow theory.

However, the efficiency of the 'debt disciplinary' effect is questionable given the particular characteristics of H&S programs. First, and most importantly, the view supported by a large section of the academic literature is that those investments are susceptible to creating value. In particular, a significant number of articles had already documented a value-creating impact before 2003[14] (the starting date of our sample). The homogeneity of these programs across firms, and the difficulty in building accurate outflow and inflow forecasts associated with their initiation in a given firm, increases the importance of these studies for decision-making. Second, the participation rate in H&S programs is generally low if employers do not make them easily accessible[15] or fail to provide adequate financial incentives.[16] This reveals that employees do not display spontaneous enthusiasm for this kind of initiative, casting further doubt on the managerial entrenchment hypothesis.

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[14] For example, Aldana (2001) provided a review of return on investment studies of corporate H&S initiatives; as regards the impact on health costs, the review reports an average return of $3.48 for every dollar expended across seven studies; regarding absenteeism reduction, the ROI estimates for four studies range from $2.50 to $10.10.

[15] For example, Erfurt and Foote (1990) found that although half of employees indicated an interest in smoking and weight-loss classes, fewer than 1 % enrolled in the classes when offered offsite, compared with 8–12 % when offered onsite.

[16] For example, Serxner et al. (2004) observe that a $100 incentive is necessary to encourage the majority of employees to perform a health risk appraisal.

Third, it is important to remember that H&S programs are productivity investments which, contrary to capital expenditures, do not serve 'empire-building' strategies.

Implications of the Results

H&S programs are the right thing to do for managers. Their implementation is important and valuable at firm level, with positive externalities for society. As a matter of fact, H&S programs belong to the set of corporate initiatives where the 'economic responsibility' and 'ethical responsibility' of managers (as defined by Carroll 2000) are aligned. In the paper, we uncover empirical associations between the implementation of H&S programs and firm characteristics. Our main result is a strong negative association between firm financial leverage and H&S programs, with an increased effect for high free cash-flow firms. Other results are the negative associations of H&S programs to CEO change and employee turnover. What do we learn from those results?

Our results on employee turnover suggest that for H&S investments, CEOs tend to act in the best interest of their firm and not society in general. Indeed, CEOs are all the more inclined to invest in H&S programs that the returns to improving their employees' health accrue to their own firms. Contributing to improve public health does not appear as a sufficient incentive for managers to invest in H&S programs. Besides, targeting the stable core of employees proves to be an insufficient argument to encourage H&S initiatives. Overall, this result teaches us that, regarding H&S, managers tend to be responsible to their firm but not to society in general.

Our results on CEO change allow us to complement the previous statement. First, it provides evidence that the decision to launch an H&S program is taken at the CEO level. This is important as capital structure decisions are set at the same level. Second, our results bring a new perspective to the previous literature on the effect of CEO departure on long-term investment decisions. In particular, Cheng (2004) finds no effect of CEO retirement on R&D activities and points out that compensation mitigates potential opportunistic reductions in R&D spending. In this paper, we look at CEO change in general. Our observation on H&S activities indicates that a short CEO horizon is an important impediment to long-term investments. Third, managers acting in the interests of their firm and society should launch a H&S program regardless of their own horizon in the firm. This is clearly not the case here. This result reveals that in order to launch an H&S program, managers need to identify a clear reward, both for the firm and for themselves.

The previous result supports the hypothesis that self-interest is an important driver of managerial behavior, in line with the fundamental hypothesis of agency theory. Private interests are not only materialistic but may also derive from the satisfaction of appearing as a 'good citizen.' Barnea and Rubin (2010) use the negative relation of CSR engagement to firms' debt and managers' ownership as the evidence of the existence of private benefits associated to CSR. From their perspective, investing in CSR activities is not consistent with the economic responsibility of managers to enhance firm's value. In their view, debt prevents overinvestment in CSR. Our results on H&S programs and financial leverage suggest that the disciplinary use of debt has negative collateral effects. Although debt is a powerful disciplinary device, debt discipline appears to have a high cost as well, as it reduces the ability of managers to pursue long-term oriented investments.

The negative association between H&S programs and debt is more important in large and highly profitable firms. Therefore, debt does not act through the financial constraints it imposes to managers, but rather through a mental pressure it exerts on them. Debt discipline is initially meant to curb opportunistic behavior of managers and make them more responsible to the shareholders and firms they serve. However, at the same time, debt also appears to narrow the managers' representation of the investment opportunity set of their firms. Our example on H&S programs reveals a 'moral failure' in the use of debt as a disciplinary device, given that managers of leveraged companies end up being less responsible to their firms. Our view is somehow related to Werhane et al. (2011), who argue that 'moral failures in business decision-making may often be traced to narrow or compromised mental models that preclude the actor from considering the moral dimensions of the decision or action.' We believe the effect we uncover for H&S programs may very well extend to other long-term important investments of firms.

This discussion echoes the interesting debate between Jensen and Meckling (1994) and Brennan (1994), later developed by Bøhren (1998), on the principal agent model representation of managers. Brennan argues that managers are not intrinsically driven by self-interest, and that treating them as such could make them more opportunistic. Bøhren adds an ethical dimension to the utility of managers. In his model, honesty acts as a free device to align principal and agent, providing superior solution to the opportunistic model. The drop in value associated to a lack of trust between the parties is a 'deadweight loss' for the firm in the author's perspective. Our results on CEO change and H&S do not exclude the possibility that managers feel discomfort from being 'dishonest.' They just suggest that self-interest is important as well. The negative association of debt discipline to H&S appears as a good illustration of the

losses associated to the use of agency theory. It complements the paper of Harris (2009) criticizing the efficacy of CEO incentive pay as another governance mechanism derived from agency theory.

Conclusion

H&S programs are documented as an efficient way of improving employees' health, with strong effects on their productivity and health-related costs. The explosion of health costs is a major issue in the U.S. and H&S programs is one important solution to alleviate this concern. In this regard, H&S programs should be a central axis of CSR. The high profitability of H&S programs at the firm level is a specific feature of this CSR investment. Indeed, firms have strong private incentives to contribute to this public good.

This paper first uncovers several strong firm-level barriers to the adoption of H&S programs and therefore contributes to the understanding of a puzzle in the health economics literature. Notably, we document an impact of both labor mobility and CEO change on the adoption of H&S programs. This suggests that private incentives at the firm and top management level play a role in the initiation of H&S investments. Our main contribution relates to the strong negative link that we uncover between financial leverage and H&S investments. This effect is robust in the face of several empirical specifications and the introduction of various control variables. Our results are not consistent with the hypothesis that leverage is adjusted to other firms' characteristics, which are correlated to H&S programs. Given the specificities of H&S programs, our results carry important messages regarding the efficiency of debt, both at the firm and society levels.

First, they allow us to revisit the link between firms' leverage and their real decisions. The capital structure literature provides strong evidence that debt has a negative impact on investment. But, as argued by Parsons and Titman (2009), 'there is still an open question about whether high leverage tends to make firms make better or worse decisions.' The consensus thus far has been that debt discourages bad investments only. However, H&S programs depart from other forms of investments considered in the literature (capital expenditure, R&D, or employee growth) in several important respects. They are continuous productivity investments, with long-term returns, and whose inflows and outflows are difficult to assess precisely ex-ante for a given company. Their strong homogeneity across firms is such that the best expectation a manager can formulate on the ex-ante profitability of implementing a program would rely on published scientific evidence (largely echoed in the press). These particular features of H&S investments bring a new perspective on the debt-

investment nexus, casting serious doubt on the efficiency of debt as a disciplinary device. The negative incidence of debt on H&S programs reveals an important hidden cost of debt for firms. Our results strongly suggest that debt, while preventing CEOs from overinvesting in poor projects, also discourages long-term profitable investments that appear as 'collateral victims' of the debt pressure. Whether or not the lost value is higher than the managerial agency costs mitigated by debt is still a pending question. However, the view that the level of leverage is optimally adjusted to the investment opportunity set of the firm appears too simplistic in the face of our observations.

Second, our paper sheds a new light on the negative link between corporate debt and CSR, already documented by Barnea and Rubin (2010). Our perspective on the disciplinary effect of debt is markedly different from theirs. In their view, managers derive private benefits from CSR activities that may result in overinvestment. In a pure agency framework, the negative link between debt and CSR is interpreted as an efficient disciplinary effect of debt on CSR. However, the specific case of H&S programs suggests that debt discipline leads to underinvestment in activities of high importance for both firms and society. Overall, our observations in the specific case of H&S are consistent with the hypothesis of 'calculating' managers. However, they also challenge the agency theory as a normative model offering valuable guidance for the design of incentives.

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