Corporate Social Responsibility and Stock Market Performance

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CSR PAPER 34.2008

DECEMBER 2008

CSRM – Corporate Social Responsibility and Sustainable Management

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Keywords: Corporate Social Responsibility, Conditional Volatility, Portfolio Choice

JEL classification: G12, D21, L21

SSRN-CEIS Working Paper No.79. The authors thank Iftekhar Hasan, William W. Lang, Leonard Nakamura, Lorenzo Sacconi, Lucio Sarno, Mark Taylor for the useful comments and suggestions received. Any remaining errors are the authors' responsibility. The usual disclaimer applies.

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Corporate Social Responsibility and Stock Market Performance*

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June 13, 2008

Abstract

We analyze the performance of a large sample of SR stocks relative to a control sample of equivalent size for 14 years. We find that individual SR stocks have on average significantly lower returns and unconditional variance than control sample stocks when controlling for industry effects. This result is paralleled by descriptive evidence on the lower (daily return) mean and variance of the buy-and-hold strategies on the SR portfolio with respect to those on the control portfolio. Beyond this first evidence we discover that: i) individual SR stocks are significantly less risky when controlling for conditional heteroskedasticity; ii) there are no significant differences in risk adjusted returns between the two buy and hold strategies on (SR and control sample) portfolios; iii) the buy-and-hold strategies on the SR portfolio exhibits significantly lower exposition to systematic non-diversifiable risk. These last findings are robust to different - market model, GARCH(1,1), APARCH(1,1) - model specifications.

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1 Introduction

The integration of product and financial markets has increased the interdependence of economic actions and made more urgent the problem of global public goods. Transnational corporations operate in an international scenario in which regulation is missing or inevitably weaker than in the domestic economic scenario.

These factors may help to explain why individuals are increasingly demanding corporations to act in a socially responsible way[1], thereby internalizing all potential negative externalities related to their activity which cannot be mitigated at the international level, in the absence of well established and enforceable international regulatory frameworks.

Spurred by consumers' pressure, corporate social responsibility (herafter also CSR) is gradually becoming a relevant feature in industrial markets[2]. One of the fundamental issues in CSR is economic sustainability. CSR practices may find acceptance and further develop in the corporate environment only if they will not endanger firm survival on highly competitive markets. With this respect, the inspection of CSR criteria (described in detail in section 3) shows that SR is not a "free lunch" as it generally implies a change in the relative weight between the target of shareholders value maximization and that of the welfare maximization of a wider set of corporate stakeholders (shareholders, but also consumers, local communities, workers, subcontractors, etc.)[3]. The inevitable consequence of this modified focus seems to be a relatively lower performance in terms of shareholders' returns which may endanger the survival of SR firms when they operate in contestable financial markets in which they become potential takeover targets.

This paper aims to shed light on this important issue by evaluating whether this claim is well funded. We do so by analyzing the stock market behavior of a large sample of firms, which are classified as SR according

[1]The "2003 Corporate social responsibility monitor" finds that the amount of consumers looking at social responsibility in their choices jumped from 36 percent in 1999 to 62 percent in 2001 in Europe. In addition, more than one in five consumers reported having either rewarded or punished companies, based on their perceived social performance and more than a quarter of share-owing Americans took into account ethical considerations when buying and selling stocks. The Social Investment Forum reports that in the US in 1999, there was more than 2 trillion worth of assets invested in portfolios that used screens linked to the environment and social responsibility.

[2]KPMG (2005) reports that in the year 2005 52 percent of the largest corporations published a CSR report.

[3]On the methodological problems related to the maximization of multiple stakeholders interests see Jensen (2001) [15] and Tirole (2001) [26].

to a well established international standard, vis vis that of a control sample (hereafter also CS) for a period of 14 years. We evaluate stock market performance of SR firms by looking at both individual stocks and aggregate buy-and-hold portfolios. The paper is divided into six sections (including introduction and conclusions). In the second section we describe the SR criteria adopted when building our sample and provide a short survey of the CSR literature. In the third section we describe the characteristics of the SR criteria adopted and their likely effects on firm performance. In the fourth section we present descriptive and econometric findings on risk and (risk adjusted) returns of SR and control sample stocks by looking at both individual stocks and passive buy and hold portfolios. In the fifth section we present an comment econometric tests on the presence of significant differences in various forms of risk and risk-adjusted returns for the two portfolios. The sixth section concludes.

2 The literature on corporate social responsibility

Even though CSR is an increasingly relevant feature of contemporary product and financial markets very few papers in the economic literature focus on CSR related topics. On the theoretical side we may easily resume the debate in the Friedman versus Freeman controversy. Friedman (1962) [12] argument is that CSR is not part of managerial duties and is highly likely to translate into a cash flow waste and, consequently, into a violation of the fiduciary relationship of managers with shareholders. Jensen (2001) further develops this point by arguing that managerial arbitrariness may be enhanced by the fact that maximisation of the interest of a heterogeneous set of stakeholders is much more complex (and less easily accountable) than the simple profit maximising behaviour. On the other hand, advocates of the stakeholder theory argue that profit maximising behaviour may be in accordance with social optimum in a framework in which well functioning institutions set proper rules and fiscal incentives to reconcile individual and social optimum, but does not hold in an economic environment riddled by conflicts of interests, agency costs and informational asymmetries in which weak or missing institutions can not perform their task. Freeman (1984) [10] starts from this assumption and argues that CSR may be the optimal strategy for minimizing transaction costs with stakeholders in such framework. A realistic point made by Tirole (2001) [26] is that the presence of firms with a more specific focus on SR together with traditional firms may be legitimate, helping to bridge

the gap between private and social optimum, but a problem of coexistence between these two types of firms may arise. If being SR implies a shift from the shareholders wealth to the stakeholders welfare maximization target, the likely consequence is that CSR firms will have lower return on equity and may easily become a takeover target.

These arguments (and the last one in particular) make clear why an empirical investigation on the relative performance of SR vs control sample firms is important. If SR firms underperform control sample firms in terms of shareholders interest, the incentive to adopt SR practices will be reduced as it weakens the competitive position of the firm and its capacity of attracting financial resources on capital market. If they do not, the incentive to adopt SR practices will be enhanced.

Previous studies have provided only partial answers to this question. A first group of contributions identifies a positive relationship between corporate social responsibility and corporate performance. More specifically: i) Soloman and Hansen (1985) [24] observe that costs of CSR in terms of higher care for stakeholders are more than compensated by positive changes in employee morale and productivity; ii) Pava and Krausz (1996) [19] and Preston and O'Bannon (1997) [20] document that financial performance is improved by CSR; iii) Stanwick and Stanwick (1998) [25] and Verschoor (1998) [27] explain the positive link by focusing on the synergies and improved relationships with shareholders; iv) Ruf et al. (2001) [21] highlight a positive link among CSR, growth in sales and returns on sales. Another relatively smaller set of contributions provides opposite results by identifying a negative link between CRS and corporate performance. In this group we find works of Preston and O'Bannon (1997) [20], Ingram and Frazier (1983) [14] and Waddock and Graves (1997) [28]. A final group of papers (Mc Williams and Siegel, 2001 [17]; Anderson and Frankle, 1980 [2]; Freedman and Jaggi, 1982 [9] and Aupperle, Caroll and Hatfield, 1985 [3]) obtains mixed findings. Among them Becchetti et al.(2006 [7]) test the effects of entry, exit and permanence in the Domini index on balance sheet data for a sample of around 1,000 US firms observed for 13 years with both panel fixed effect and GMM estimates. Paper findings show that Domini affiliation significantly reduces return on equity, while having positive and significant effects on net sales per worker. Overall, these findings are not inconsistent with the hypothesis that CSR shifts the corporate focus from the maximization of shareholder's value to that of the interest of a wider set of stakeholders. This change of focus may reduce the slice of the "value cake" going to shareholders, but does not necessarily reduce the size of the cake itself, since value added and productivity may be higher in CSR firms as a result of higher workers' intrinsic motivation

(Ryan et al., 1991 [22]; Frey and Oberholzer-Gee, 1997 [11]; Kreps, 1997 [16]) and minimization of transaction costs with stakeholders (Freeman, 1984) [10].

A main problem of this strand of the literature is that it focuses on balance sheet data. The consequence of this choice is that, even if these comparative analyzes establish the relative superiority of one or the other group of firms in terms of a given performance indicator (i.e. ROE), they cannot correct for risk as it is possible to do when examining the problem on financial market data. Moreover, even in panel estimates, the problem of endogeneity between corporate performance and CSR may be particularly severe (does CSR positively (negatively) affect corporate performance or are more (less) profitable firms more likely to opt for CSR?). Our research based on financial data partially avoids this problem as the only question here, independently from the causal relationship, is whether CSR stocks are more or less profitable than control sample ones when adjusted for risk. The paper has only two recent close references in the literature. Bauer et al. (2002) [5] compare active strategies of ethical and traditional investment funds finding mixed results (not univocal prevalence of one over the other) but observing a learning process which gradually improves the performance of ethical investment fund managers. Geczy et al. (2003) [13] find that SR funds underperform with respect to non SR funds. The difference of our study with respect to the above mentioned ones is that we depurate the analysis from the effects of fund manager ability as we are interested in the "intrinsic" performance of the two different types of stocks. We therefore focus on passive buy and hold strategies and carefully adjust for risk the performance of CSR and CS stocks by taking into account the problem of conditional and unconditional volatility of individual stocks and portfolio returns and the existence of asymmetries in shock reaction.

3 The CSR Benchmark Adopted for The Empirical Analysis

To perform our analysis we choose as CSR indicator the Domini Social Index 400 (DSI 400) developed by Kinder, Lydenberg and Domini.

The Index is a market capitalization-weighted common stock index which monitors the performance of 400 US corporations that pass multiple, broad-based social screens. The constituents of the DSI 400 are approximately 250 companies included in the Standard & Poor's 500 Composite Index (S&P500), approximately 100 additional large companies not included in

the S&P500 but providing industry representation, and approximately 50 additional companies with particularly strong social characteristics.

Inclusion in the index is based on the SR screening of Kinder, Lydenberg and Domini Research & Analytics, Inc. (KLD), the leading research group in providing ratings of corporate social performance to investors. KLD screens around 3,000 firms accounting for 98 percent of total market value of US public equities (Barnea-Rubin, 2005 [4]). The screening approach is in two steps. In the first step a group of firms is excluded if their activity is for a significant share in controversial industries (alcohol, tobacco, or gambling; companies that derive more than 2 percent of gross revenues from the production of military weapons; and electric utilities that own interests in nuclear power plants or derive electricity from nuclear power plants in which they have an interest). From the first group of firms a subset of SR firms is selected according to a series of qualitative indicators grouped in eight categories (community; corporate governance; diversity; employee relations; environment; human rights; product quality; controversial business issues). For each of them the Domini index identifies strengths and weaknesses, and lists a series of corporate actions falling under one of them (see Appendix 1). The Domini social screens represent a widely acknowledged international standard and determine, through affiliation to the Index, the possibility for a stock of being included among those selected in many ethical fund portfolios, which follow in most cases passive buy and hold strategies on the Domini index itself. The definition of Domini CSR criteria may obviously be questionable and open to debate but at the moment the Domini classification represents the most reliable source of regular and systematic information on CSR and is therefore the reference for our econometric analysis.

To compare the performance of a SR portfolio with a benchmark [4] we build a control sample with the same number of firms taken from S&P and with similar size and industry characteristics.

[4]The problem of benchmarking for ethical fund portfolios is quite difficult to solve with standard indexes since these portfolios have no defined geographical, size and industry representation. In our case the problem of geographical representation does not arise since all selected stocks are from the S&P. We therefore accurately check that our control sample is homogeneous in terms of industry and size characteristics in portfolio comparisons. However, in individual stock comparisons we introduce industry dummies to control for industry effects in the estimates.

3.1 The expected effects of Domini criteria on corporate performance

The inspection of Domini screens (Appendix 1) clearly shows that there are no "free lunches" in social responsibility since the increased focus on stakeholders interest often implies additional costs. This is particularly true for the following Domini items: i) charitable giving, support for education and support for housing included among strengths in the community section; ii) work benefits (the company has outstanding employee benefits or other programs addressing work/life concerns, e.g. childcare, eldercare or flextime) (diversity section); iii) cash profit sharing programs, health and safety strength and strong retirement benefit programs (employee relations section); iv) clean air programs or significant measures to reduce [their] impact on climate change and air pollution through use of renewable energy and clean fuels or through energy efficiency or a commitment to promoting climate-friendly policies and practices outside its own operations (environment section); v) Indigenous Peoples Relations Strength (the company has established relations with indigenous peoples near its proposed or current operations -either in or outside the U.S- that respect the sovereignty, land, culture, human rights and intellectual property of the indigenous peoples) and Labor Rights Strength (the company has outstanding transparency on overseas sourcing disclosure and monitoring or has particularly good union relations outside the U.S.) (human right section).

On the other side, when looking for items with cost reducing potential among Domini screens, we find one domain (product quality) and an additional item in the corporate governance domain (the limited compensation of the manager) which may be considered, respectively, as profit enhancing and cost decreasing, with potential additional productivity enhancing effects if workers exhibit inequity aversion in their preferences. The inclusion of the product quality category is particularly important since, in a framework of asymmetric information between sellers and consumers, and when the costs of buying a low quality product are particularly high for consumers (i.e. in terms of health, safety, etc.), CSR may have the important role of signalling product quality to them. Nonetheless, we find that several of the same cost increasing items commented above may also have cost decreasing effects, under the assumption that they also have positive impact on workers monetary incentives and intrinsic motivations [5]. These are the programs of Work/Life

[5]The productivity enhancing effect of the latter is widely analysed by the efficiency wage literature (Yellen, 1984 [29]) in shirking (Stiglitz-Shapiro, 1984 [23]) and gift exchange models (Akerlof, 1982 [1]). Furthermore, the importance of intrinsic motivations in productivity, and the availability of workers to accept lower wages are strong (and even

Benefits (the company has outstanding employee benefits or other programs addressing work/life concerns, e.g. childcare, eldercare or flextime) and several strength factors in the employee relations section such as: i) Cash Profit Sharing (the company has a cash profit-sharing program through which it has recently made distributions to a majority of its workforce); ii) Employee Involvement (the company strongly encourages worker involvement and/or ownership through stock options available to a majority of its employees, gain sharing, stock ownership, sharing of financial information, or participation in management decision-making); iii) Health and Safety Strength (the company is noted by the US Occupational Health and Safety Administration for its safety programs); iv) Retirement Benefits Strength (the company has a notably strong retirement benefits program); v) Union Relations (the company has a history of notably strong union relations); vi) Other Strength (the company has strong employee relations initiatives not covered by other KLD ratings).

4 Individual stock and portfolio performance

4.1 Individual stock performance

We calculate daily compounded returns from January 1990 to December 2003 for a total of 3,651 observations for each stock on our SR and control sample portfolios. [6] In the final selection we include in the SR portfolio (control group portfolio) only stocks of those companies which are always (never) in the Domini index (the total number of selected stocks from both samples is 376). We are fully aware that the choice of not including stocks which change their SR status during the sample period may create a survivorship bias problem. An argument in favor of this choice is that the survivorship bias applies to both the SR and control samples in a similar way since we expect that a major financial distress leads to exit from both the S&P and the SR Domini index. Under the hypothesis of a similar structure of delistings from the SR and control sample portfolios due to financial distress survivorship bias should not affect our comparative findings.

voluntary work) when intrinsic motivations are strong (Ryan et al., 1991 [22]; Frey and Oberholzer-Gee, 1997 [11]; Kreps, 1997 [16]), suggests that the latter act as a partial substitute of pecuniary transfers and are therefore a channel through which corporate social responsibility, by fostering alignment between corporate goals and workers' motivation, may increase workers' productivity.

[6] Daily stock prices are collected from CRSP.

We perform a first analysis of daily compounded returns and unconditional variances on individual stocks being part of the SR and control samples. Descriptive evidence provided in Table 1 shows that Domini firms have on average lower average daily returns and unconditional variance than the control sample.

To test whether CSR has significant impact on these two parameters, net of composition effects, we estimate the following specification

$$\begin{aligned} Var_i(Mean_i) &= \alpha_0 + \alpha_1 * BasicMaterials_i + \alpha_2 * Chemicals_i + \\ &\alpha_3 * ConsumerCyclical_i + \alpha_4 * Energy_i + \alpha_5 * Financial_i + \\ &\alpha_6 * Healthcare_i + \alpha_7 * Industrial_i + \alpha_8 * NonCyclical_i + \\ &\alpha_9 * Technology_i + \alpha_{10} * Telecom_i + \alpha_{11} * Utilities_i + \\ &\alpha_{12} * Domini_i + \epsilon_i, \end{aligned} \tag{1}$$

where all regressors are industry dummies with the exception of the Domini variable which is a dummy taking the value of one for Domini stocks and zero otherwise.

Our findings show that the Domini dummy is strongly significant both in the stock return and in the unconditional variance equation (Table 2). More specifically, CSR stocks seem to have significantly lower unconditional variance and daily returns than the control sample.

Preliminary diagnostics on daily returns of sample stocks highlighted the presence of excess kurtosis and conditional heteroskedasticity in the data (Table 1). To take more properly into consideration conditional heteroskedasticity we estimate a simple GARCH(1,1) model for each of the individual stocks in the two portfolios and test whether Domini affiliation affects parameters of the GARCH(1,1) estimate after controlling for industry dummies. More formally, we estimate for each stock i the following model

$$R_{it} = \beta_{0i} + \theta_{1i} RI_t + \varepsilon_{it},$$

where $\varepsilon_{it} \sim (0, h_t)$ and

$$h_t = \beta_{1i} + \beta_{2i}(\varepsilon_{t-1})^2 + \beta_{3i} h_{t-1}^2.$$

As it is well known R_{it} is the daily compounded return of the i^{th} stock, RI_t is the daily compounded return of the stock index while h_t is the conditional variance of the residual of the first equation. In a second step we estimate the following regression

$$\begin{aligned}\beta_{ji} &= \alpha_0 + \alpha_1 * BasicMaterials_i + \alpha_2 * Chemicals_i + \\ &\quad \alpha_3 * ConsumerCyclical_i + \alpha_4 * Energy_i + \alpha_5 * Financial_i + \\ &\quad \alpha_6 * Healthcare_i + \alpha_7 * Industrial_i + \alpha_8 * NonCyclical_i + \\ &\quad \alpha_9 * Technology_i + \alpha_{10} * Telecom_i + \alpha_{11} * Utilities_i + \\ &\quad \alpha_{12} * Domini_i + \epsilon_i, \end{aligned} \tag{2}$$

where β_{ji} $(j = 0, \ldots, 3)$ is the relevant individual stock GARCH(1,1) coefficient and the regressors are defined as (1)[7].

When estimating (2) we wonder whether CSR makes a difference in terms of excess returns adjusted for conditional variance (the β_{0i} coefficient) and find that such variable has no significant effect on them (Table 3, column 1). Furthermore, we find that inclusion into the Domini 400 index is associated to a significantly lower intercept of the conditional variance equation (Table 3, column 2). Finally, we do not find any evidence of significant differences for two of the three coefficients of the conditional variance equation (measuring reaction to lagged shocks and persistence of conditional variance) even though we observe that persistence in SR stock is lower with weak statistical significance (Table 3, columns 2 and 3). These findings imply that non CSR shocks have a significantly higher conditional variance, net of the lagged shock and conditional variance persistence effect and that individual CSR stocks are significantly less risky, but not less rewarding, than those of the control sample.

4.2 Market Model and GARCH (1,1) Model for the Two Portfolios

In this section we move from the individual stock to the portfolio performance analysis. Given the complex network of covariance relationships among port-

[7]The assumption necessary for the two step approach is that the residual of the GARCH (1,1) estimate is uncorrelated with that of the estimate of specifications in (2).

folio stocks, it is well known that findings from individual stock and portfolio analysis may not coincide[8].

When we look at the performance of the two buy-and-hold strategies on the SR and control sample portfolios from a descriptive point of view, we find that the SR portfolio has lower mean daily returns (0.015 against 0.022 percent), even though the difference with respect to the control sample is not significant (Table 4). Lower mean daily returns are coupled with lower standard errors (.000065 against .000071 for the SR portfolio). After this first descriptive investigation we aim to evaluate differences between the two portfolios by looking at excess returns adjusted for different forms of risk (exposition to systematic non-diversifiable risk, conditional variance, its persistence and its reaction to shock). For this reason we estimate three models: i) a market model which does not take into account the problem of conditional heteroschedasticity; ii) a GARCH(1,1) model which takes into account the problem of heteroskedasticity and allows to evaluate different aspects of risk; iii) an asymmetric power ARCH (APARCH) (1,1) model in which portfolio returns have an AR(1) structure and leverage effects and the hypothesis of the standard power (of 2) of lagged shocks are explicitly tested.

The market model highlights a significant difference between the two portfolios in terms of exposition to systematic non-diversifiable risk. The beta of the SR portfolio is slightly but significantly smaller than that of the complementary sample, while no difference arises in terms of excess returns (Table 4). As mentioned above, the LM test on model residuals does not reject the hypothesis of conditional heteroskedasticity [9]. This finding coupled with the excess kurtosis of portfolio returns (Table 4) leads us to estimate a GARCH (1,1) model in which conditional heteroskedasticity is explicitly taken into account.

Findings from this specification confirm the significant difference between the two portfolios in terms of betas (Table 5). We do not find any evidence of significant differences in the other coefficients of the model (excess returns, intercept of conditional variance, reaction to shocks, persistence of conditional variance).

[8]Empirical results from the contrarian strategy literature show that small size portfolios are not significantly riskier than large size ones, while the average risk of individual small size stocks is significantly higher than that of individual large size stocks. These findings document that small size portfolios achieve significant diversification gains reducing the risk run when holding individual small size stocks (Becchetti-Cavallo, 2002) [6].

[9]Results are omitted for reasons of space and available from the authors upon request.

4.3 The APARCH (1,1) Model

A well established stylized fact in empirical studies on conditional volatility is the existence of an asymmetry in the reaction to shocks of the conditional volatility with, generally, a significantly higher reaction to negative news (leverage effect)[10]. Moreover, the same power at which lagged shocks affect conditional volatility may not exactly coincide with two and should be left to model estimation. For this reason we decide to estimate an asymmetric power ARCH (APARCH) model in which the exponent of lagged shocks in the second equation is estimated and the hypothesis of asymmetric effects of negative and positive shocks is directly tested. Furthermore, since the inspection of partial autocorrelation of portfolio stock returns clearly evidences the existence of an AR(1) structure, we incorporate it into the APARCH(1,1) model.

Zhuanxin, Granger and Engle (1993) [30] specify the conditional variance equation for a generic APARCH (p,q) model as follows:

$$\sigma_t^\delta = \alpha_0 + \sum_{i=1}^{q} \alpha_i (|\varepsilon_{t-i}| - \gamma_i \varepsilon_{t-i})^\delta + \sum_{j=1}^{p} \beta_j \sigma_{t-j}^\delta,$$

where $\alpha_0 = 0$, $\delta \geq 0$, $\beta_j \geq 0$ $(j = 1, \ldots, p)$, $\alpha_i \geq 0$ and $-1 < \gamma_i < 1$ $(i = 1, \ldots, q)$.

In our estimation we choose the following simpler APARCH (1,1) specification in which

$$R_t = \mu + \psi_1 RI_t + \phi_1 R_{t-1} + \varepsilon_t$$

and

$$\sigma_t^\delta = K_1 + \alpha_1 (|\varepsilon_{t-1}| - \gamma_1 \varepsilon_{t-1})^\delta + \beta_1 \sigma_{t-1}^\delta,$$

[10]The so called Leverage Effect appears firstly in Black (1976) [8], who notes that "a drop in the value of the firm will cause a negative return on its stock, and will usually increase the leverage of the stock. [...] That rise in the debt-equity ratio will surely mean a rise in the volatility of the stock". One of the first models testing for the leverage effect is the EGARCH model developed by Nelson (1991) [18].

where R_t and RI_t are, respectively, the daily compounded returns of the portfolio and of the index, γ_1 measures the leverage effect and δ the power of the conditional variance equation.

The model is estimated for the overall period and for the second half of the sample period (1997-2003). Our findings confirm that our choice of a more complex conditional volatility model was justified. The leverage parameter γ_1 is significant highlighting that the impact of negative shocks on conditional variance is relatively stronger in magnitude. Furthermore, the power of the shocks in the conditional variance equation is significantly lower than two in the overall sample period estimate confirming that our choice of not imposing a priori the standard power of ARCH and GARCH models, was correct. With regard to the comparison of characteristics of SR and control sample portfolios, we observe that their coefficients do not present significant differences in magnitude, with the exception of exposition to systematic non-diversifiable risk in the first equation. In such case the parameter of the SR portfolio is slightly but significantly lower than that of the control sample portfolio, confirming the evidence obtained when estimating the GARCH (1,1) models (Table 5). The effect becomes much stronger (.77 against .84) when we estimate the same model in the second half of the sample period (Table 6).

5 Conclusions

The impact of CSR on corporate performance has been empirically tested so far mainly on balance sheet data by focusing on various performance indicators (value added per workers, return on equity, etc.). What is missing in these types of analyses is an evaluation of the effects of CSR on shareholders value. The latter is an important part of the issue since it may help to understand whether also unconcerned shareholders may find it convenient to invest in CSR, or, in a different perspective, it may illustrate the costs in terms of reduced financial performance that concerned shareholders choosing SR investment funds have to pay for their choice.

Even if balance sheet empirical analyses may partially answer also to this question by focusing on return on equity it is extremely difficult to adjust for risk (and control for endogeneity) the obtained findings in this kind of estimates. In other words, the finding that SR firms have higher or lower return on equity may not imply that they are to be preferred by a financial investor if this evidence is not adjusted for risk.

In this paper we try to provide an evaluation of the issue from a risk-return perspective using stock market data. In a first step, we look at simple daily compounded returns and unconditional variances of individual stocks and discover that both of them are significantly lower in SR stocks than in the control sample, net of the effect of industry affiliation.

To provide a conclusive answer which takes into account conditional heteroskedasticity in individual stock returns we therefore estimate a GARCH (1,1) model for each stock and find that, while the coefficients of the lagged dependent variable and of the one period lagged shock in the conditional variance equation are not significantly different, the intercept of the same equation is significantly lower for control sample stocks. Moreover, we document that the (conditional) risk adjusted excess returns of the two kind of stocks are not significantly different from each other. Having concluded that individual SR stocks do not exhibit inferior risk adjusted returns and are significantly less risky (in one specific dimension) than non CSR stocks, we extend our analysis to SR and control sample stock portfolios. In such case both GARCH(1,1) and APARCH (1,1) estimates, highlight that the passive buy-and-hold strategy on the SR portfolio exhibits significantly lower exposition to systematic nondiversifiable risk.

Overall, our findings tend to show that risk adjusted returns from SR stocks are not significantly lower than those of control sample stocks, but that the former tend to be less risky (in terms of intercept of the conditional variance equation in the case of individual stocks and in terms of betas in the case of the buy and hold portfolio strategies). A rationale for our findings may be in the different attitude of SR and "non SR concerned" investors, with the former being more patient [11], or in the differences in intrinsic characteristics of SR and control sample stocks, if we assume that CSR helps to minimize transaction costs with stakeholders, thereby reducing an important source of corporate risk.

A final evaluation on the relative performance of SR and control sample individual stocks and portfolios must also take into account three additional costs of SR investment funds (the loss of diversification induced by the restriction of the universe of stocks which can be included in the portfolio, the additional costs of information required for the SR evaluation and the cost of disinvestment when exit from SR does not coincide with a change in the expected profitability of the stock included in the portfolio). Not too restrictive criteria of selection, passive CSR rules following inclusion/exclusion from standard CSR indexes may lead the first two costs almost to zero, while rea-

[11] Remember that most of ethical fund investing comes from institutional investors such as pension funds, religious institutions, CDFIs, etc.

sonable disinvestment windows may significantly reduce also the third one. Even when considering these important additional elements results from this paper may represent an important building block to which the above mentioned extra costs and the individual investor preferences for SR must be added for a final comprehensive evaluation of the economic convenience of investing in SR stocks.

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TABLES

Table 1: **Descriptive Statistics on individual SR and control sample stocks.**

Overall							
	mean	median	sd	kurt	skew	p25	p75
Mean	.00021	.00017	.0002	62.58	6.04	.00008	.00029
Std. Dev.	.01248	.01047	.0066	10.35	2.23	.00818	.01486
SR (Domini) stocks							
	mean	median	sd	kurt	skew	p25	p75
Mean	.00015	.00014	.0001	9.45	.97	.00007	.00022
Std. Dev.	.01108	.00951	.0048	6.88	1.88	.00799	.01233
Control sample (non Domini) stocks							
	mean	median	sd	kurt	skew	p25	p75
Mean	.00027	.00020	.0003	42.18	5.28	.00012	.00035
Std. Dev.	.01398	.01165	.0078	8.46	1.97	.00879	.01760

Table 2: **The effect of CSR (affiliation to the Domini index) on unconditional returns and unconditional variance of individual stocks.** The table reports results from the following specification: $Var_i(Mean_i) = \alpha_0 + \alpha_1 * BasicMaterials_i + \alpha_2 * Chemicals_i + \alpha_3 * ConsumerCyclical_i + \alpha_4 * Energy_i + \alpha_5 * Financial_i + \alpha_6 * Healthcare_i + \alpha_7 * Industrial_i + \alpha_8 * NonCyclical_i + \alpha_9 * Technology_i + \alpha_{10} * Telecom_i + \alpha_{11} * Utilities_i + \alpha_{12} * Domini_i + \epsilon_i$, All regressors are industry dummies with the exception of the Domini variable which is a dummy taking the value of one for SR stocks and zero otherwise. T-stats in round brackets. The model is estimated with heteroskedasticity robust standard errors

	Var(Robust)	Mean(Robust)
Basic Materials	-.00005	-.00004
(t)	(-1.26)	(-.62)
Chemicals	.00001	-.00002
	(.60)	(-.27)
Consumer cyclical	.00007	.00013
	(1.56)	(1.91)
Energy	-.00004	-.00001
	(-.84)	(-.24)
Financial	.00001	.00006
	(.12)	(1.10)
Healthcare	.00006	.00013
	(1.53)	(2.07)
Industrial	.00006	.00003
	(1.23)	(.50)
Non Cyclical	.00001	.00006
	(.25)	(.97)
Technology	.00024	.00010
	(3.49)	(1.19)
Telecom	-.00002	-.00005
	(-.45)	(-.93)
Utilities	-.00003	-.00004
	(-.47)	(-.81)
S − Domini	-.00009	-.00011
	(-3.68)	(-3.86)
Cons.	.00019	.00020
	(4.39)	(3.25)
R^2 *Normal*	.12	.07
$F - test$	5.97	10.42
$(Prob > F)$	0.0000	0.0000
Obs.	435	435

Table 3: **The effect of CSR (affiliation to the Domini index) on the parameters of GARCH (1,1) model for individual stocks.** The table reports in columns 1 to 4 results from the following estimation: $\beta_{ji} = \alpha_0 + \alpha_1 * BasicMaterials_i + \alpha_2 * Chemicals_i + \alpha_3 * ConsumerCyclical_i + \alpha_4 * Energy_i + \alpha_5 * Financial_i + \alpha_6 * Healthcare_i + \alpha_7 * Industrial_i + \alpha_8 * NonCyclical_i + \alpha_9 * Technology_i + \alpha_{10} * Telecom_i + \alpha_{11} * Utilities_i + \alpha_{12} * Domini_i + \epsilon_i$, where regressors are defined as (1) and β_{ji} $(j = 0, .., 3)$ are the individual stock GARCH(1,1) coefficients estimated from the following equation $R_{it} = \beta_{0i} + \theta_{1i} RI_t + \varepsilon_{it}$ where $\varepsilon_{it} \sim (0, h_t)$ and $h_t = \beta_{1i} + \beta_{2i}(\varepsilon_{t-1})^2 + \beta_{3i} h_{t-1}^2$. T-stats in round brackets.

	β_{0i}	β_{1i}	β_{2i}	β_{3i}
Basic materials	-.0066	.00003	-.07	.02
(t)	(-.22)	(.72)	(-.76)	(.33)
Chemicals	.0002	.0000	.02	-.03
	(.01)	(.08)	(.25)	(-.62)
Consumer cyclical	-.0059	.00005	-.0003	-.004
	(-.23)	(1.35)	(-.00)	(-.10)
Energy	-.0066	.00003	-.04	-.02
	(.22)	(.80)	(-.48)	(-.40)
Financial	.0058	.00005	-.04	.006
	(.22)	(1.34)	(-.54)	(.12)
Healthcare	-.0061	.00004	-.03	-.07
	(-.23)	(1.17)	(-.41)	(-1.39)
Industrial	.0041	.00007	.03	-.03
	(.16)	(1.84)	(.38)	(-.62)
Non Cyclical	-.0058	.00005	-.01	-.01
	(-.20)	(1.25)	(-.20)	(-.28)
Technology	-.0066	.00005	-.04	.006
	(-.25)	(1.46)	(-.49)	(.12)
Telecom	-.0065	.00003	.03	.01
	(-.20)	(.61)	(.25)	(.21)
Utilities	-.0053	.00005	-.04	.008
	(-.24)	(1.88)	(-.73)	(.20)
S − Domini	-.0015	-.00002	-.02	.03
	(-.24)	(-2.05)	(-.80)	(1.75)
Cons.	.0073	-.00001	.17	.83
	(.28)	(-.39)	(2.22)	(16.75)
R^2	.01	.02	.01	.03
F − test	.31	.90	.50	1.01
(Prob > F)	0.9882	0.5482	0.9166	0.4416
Obs.	376	376	376	376

Table 4: **Unconditional mean and standard deviation of the SR and control sample portfolios.**

	SR portfolio	Control sample portfolio
$Mean$	.00015	.00022
$median$	.00016	.00022
sd	.0039	.0043
$kurt$	7.10	6.82
$skew$	-.18	-.23
$p25$	-.0017	-.0018
$p75$	.0021	.0024
$Std.\ Err.$	.000065	.000071
$Conf.\ Int.$	[.000026; .00028]	[.000085; .000365]
$Obs.$	3651	3651

Table 5: **Estimation of the Market Model for the SR and control sample portfolios.**

	SR portfolio	Control sample portfolio
$S\&P$	.81	.86
(z)	(142.38)	(120.67)
$Conf.\ Int.$	[.799;.821]	[.843;.877]
$Cons.$	.000046	.000110
(z)	(1.80)	(3.45)
$Adj.\ R^2$	.85	.80
$F-test$	20273.20	14562.22
$(Prob > F)$	0.0000	0.0000
$Obs.$	3651	3651

Table 6: **Estimation of the GARCH(1,1) Model for the SR and control sample portfolios. Total period and second subperiod.** The model is specified as follows: $R_{it} = \beta_{0i} + \theta_{1i} RI_t + \varepsilon_{it}$ where $\varepsilon_{it} \sim (0, h_t)$ and $h_t = \beta_{1i} + \beta_{2i}(\varepsilon_{t-1})^2 + \beta_{3i} h_{t-1}^2$.

	1990-2003		1997-2003	
	SR portfolio	Control sample portfolio	SR portfolio	Control sample portfolio
θ_{1i}	.80	.84	.77	.84
(z)	(193.76)	(140.80)	(141.95)	(113.47)
$Conf.\ Int.$	[.8016;.8180]	[.8283;.8517]	[.7677.7892]	[.8324;.8616]
β_{0i}	.00006	.00012	.00006	.00014
(z)	(2.97)	(4.38)	(1.75)	(3.08)
$ARCH:$				
β_{2i}	.10	.07	.11	.09
(z)	(13.14)	(8.81)	(7.40)	(6.86)
β_{3i}	.86	.88	.84	.83
(z)	(109.95)	(62.79)	(39.20)	(33.85)
β_{1i}	7.34e-08	1.60e-07	1.42e-07	2.86e-07
(z)	(10.79)	(5.25)	(4.39)	(4.16)
$Wald\ \chi^2$	37544.16	19825.51	20149.86	12875.06
$(Prob > \chi^2)$	0.0000	0.0000	0.0000	0.0000
$Obs.$	3651	3651	1825	1825

Table 7: **Estimation of the APARCH (1,1) Model for the SR and control sample portfolios. Total Period and second subperiod.** The model is specified as follows: $R_t = \mu + \psi_1 RI_t + \phi_1 y_{t-1} + \varepsilon_t$ where $\sigma_t^\delta = K_1 + \alpha_1(|\varepsilon_{t-1}| - \gamma_1 \varepsilon_{t-1})^\delta + \beta_1 \sigma_{t-1}^\delta$.

	1990-2003		1997-2003	
	SR portfolio	Control sample portfolio	SR portfolio	Control sample portfolio
ψ_1	.80	.83	.77	.84
(z)	(183.23)	(140.09)	(133.97)	(111.91)
$Cons.$	.00006	.00011	.00005	.00013
(z)	(2.58)	(3.44)	(1.31)	(2.70)
ϕ_1	.13	.06	.08	.04
(z)	(8.14)	(3.86)	(3.78)	(1.80)
$ARCH:$				
γ_1	.09	.06	.09	.08
(z)	(13.80)	(7.43)	(6.69)	(5.19)
δ	1.32	1.53	2.12	2.01
(z)	(9.13)	(8.86)	(7.99)	(4.01)
$Wald\ \chi^2$	33574.89	19637.62	18104.32	12526.07
$(Prob > \chi^2)$	0.0000	0.0000	0.0000	0.0000
$Obs.$	3651	3651	1825	1825

Appendix 1

Criteria of KLD social ratings

SOCIAL ISSUE RATINGS.

COMMUNITY

STRENGTHS. Charitable Giving. The company has consistently given over 1.5% of trailing three-year net earnings before taxes (NEBT) to charity, or has otherwise been notably generous in its giving. Innovative Giving. The company has a notably innovative giving program that supports nonprofit organizations, particularly those promoting self-sufficiency among the economically disadvantaged. Companies that permit nontraditional federated charitable giving drives in the workplace are often noted in this section as well. Non-US Charitable Giving. The company has made a substantial effort to make charitable contributions abroad, as well as in the U.S. To qualify, a company must make at least 20% of its giving, or have taken notably innovative initiatives in its giving program, outside the U.S. Support for Housing. The company is a prominent participant in public/private partnerships that support housing initiatives for the economically disadvantaged, e.g., the National Equity Fund or the Enterprise Foundation. Support for Education. The company has either been notably innovative in its support for primary or secondary school education, particularly for those programs that benefit the economically disadvantaged, or the company has prominently supported job-training programs for youth. Other Strength. The company has either an exceptionally strong volunteer program, in-kind giving program, or engages in other notably positive community activities.

CONCERNS. Investment Controversies. The company is a financial institution whose lending or investment practices have led to controversies, particularly ones related to the Community Reinvestment Act. Negative Economic Impact. The company's actions have resulted in major controversies concerning its economic impact on the community. These controversies can include issues related to environmental contamination, water rights disputes, plant closings, "put-or-pay" contracts with trash incinerators, or other company actions that adversely affect the quality of life, tax base, or property values in the community. Other Concern. The company is involved with a controversy that has mobilized community opposition, or is engaged in other noteworthy community controversies.

CORPORATE GOVERNANCE

STRENGTHS. Limited Compensation. The company has recently awarded notably low levels of compensation to its top management or its board members. The limit for a rating is total compensation of less than $\$500,000$ per year for a CEO or $\$30,000$ per year for outside directors. Ownership

Strength. The company owns between 20% and 50% of another company KLD has cited as having an area of social strength, or is more than 20% owned by a firm that KLD has rated as having social strengths. When a company owns more than 50% of another firm, it has a controlling interest, and KLD treats the second firm as if it is a division of the first. Other Strength. The company has an innovative compensation plan for its board or executives, a unique and positive corporate culture, or some other initiative not covered by other KLD ratings.

CONCERNS. High Compensation. The company has recently awarded notably high levels of compensation to its top management or its board members. The limit for a rating is total compensation of more than $\$10 million$ per year for a CEO or $\$100,000$ per year for outside directors. Tax Disputes. The company has recently been involved in major tax disputes involving more than $\$100 million$ with the Federal, state, or local authorities. Ownership Concern. The company owns between 20% and 50% of a company KLD has cited as having an area of social concern, or is more than 20% owned by a firm KLD has rated as having areas of concern. When a company owns more than 50% of another firm, it has a controlling interest, and KLD treats the second firm as if it is a division of the first. Other Concern. The company restated its earnings over an accounting controversy, has other accounting problems, or is involved with some other controversy not covered by other KLD ratings.

DIVERSITY

STRENGTHS. CEO. The company's chief executive officer is a woman or a member of a minority group. Promotion. The company has made notable progress in the promotion of women and minorities, particularly to line positions with profit-and-loss responsibilities in the corporation. Board of Directors. Women, minorities, and/or the disabled hold four seats or more (with no double counting) on the board of directors, or one-third or more of the board seats if the board numbers less than 12. Work/Life Benefits. The company has outstanding employee benefits or other programs addressing work/life concerns, e.g., childcare, elder care, or flextime. Women & Minority Contracting. The company does at least 5% of its subcontracting, or otherwise has a demonstrably strong record on purchasing or contracting, with women- and/or minority-owned businesses. Employment of the Disabled. The company has implemented innovative hiring programs, other innovative human resource programs for the disabled, or otherwise has a superior reputation as an employer of the disabled. Gay & Lesbian Policies. The company has implemented notably progressive policies toward its gay and lesbian employees. In particular, it provides benefits to the domestic partners of its employees. Other Strength. The company has made a notable commitment to diversity that is not covered by other KLD ratings.

CONCERNS. Controversies. The company has either paid substantial

fines or civil penalties as a result of affirmative action controversies, or has otherwise been involved in major controversies related to affirmative action issues. Non-Representation. The company has no women on its board of directors or among its senior line managers. Other Concern. The company is involved in diversity controversies not covered by other KLD ratings.

EMPLOYEE RELATIONS

STRENGTHS. Cash Profit Sharing. The company has a cash profit-sharing program through which it has recently made distributions to a majority of its workforce. Employee Involvement. The company strongly encourages worker involvement and/or ownership through stock options available to a majority of its employees, gain sharing, stock ownership, sharing of financial information, or participation in management decision-making. Health and Safety Strength. The company is noted by the US Occupational Health and Safety Administration for its safety programs. Retirement Benefits Strength. The company has a notably strong retirement benefits program. Union Relations. The company has a history of notably strong union relations. Other Strength. The company has strong employee relations initiatives not covered by other KLD ratings.

CONCERNS. Union Relations. The company has a history of notably poor union relations. Health and Safety Concern. The company recently has either paid substantial fines or civil penalties for willful violations of employee health and safety standards, or has been otherwise involved in major health and safety controversies. Workforce Reductions. The company has reduced its workforce by 15% in the most recent year or by 25% during the past two years, or it has announced plans for such reductions. Retirement Benefits Concern. The company has either a substantially underfunded defined benefit pension plan, or an inadequate retirement benefits program. Other Concern. The company is involved in an employee relations controversy that is not covered by other KLD ratings.

ENVIRONMENT

STRENGTHS. Beneficial Products and Services. The company derives substantial revenues from innovative remediation products, environmental services, or products that promote the efficient use of energy [costa], or it has developed innovative products with environmental benefits. (The term "environmental service" does not include services with questionable environmental effects, such as landfills, incinerators, waste-to-energy plants, and deep injection wells.) Clean Energy. The company has taken significant measures to reduce its impact on climate change and air pollution through use of renewable energy and clean fuels or through energy efficiency. The company has demonstrated a commitment to promoting climate-friendly policies and practices outside its own operations. Communications. The company is a signatory to the CERES Principles, publishes a notably substantive

environmental report, or has notably effective internal communications systems in place for environmental best practices. Pollution Prevention. The company has notably strong pollution prevention programs including both emissions reductions and toxic-use reduction programs. Recycling. The company either is a substantial user of recycled materials as raw materials in its manufacturing processes, or a major factor in the recycling industry. Other Strength. The company has demonstrated a superior commitment to management systems, voluntary programs, or other environmentally proactive activities.

CONCERNS. Hazardous Waste. The company's liabilities for hazardous waste sites exceed $50*million* [vantaggio per le SR], or the company has recently paid substantial fines or civil penalties for waste management violations. Regulatory Problems. The company has recently paid substantial fines or civil penalties for violations of air, water, or other environmental regulations, or it has a pattern of regulatory controversies under the Clean Air Act, Clean Water Act or other major environmental regulations. Ozone Depleting Chemicals. The company is among the top manufacturers of ozone depleting chemicals such as HCFCs, methyl chloroform, methylene chloride, or bromines. Substantial Emissions. The company's legal emissions of toxic chemicals (as defined by and reported to the EPA) from individual plants into the air and water are among the highest of the companies followed by KLD. Agricultural Chemicals. The company is a substantial producer of agricultural chemicals, i.e., pesticides or chemical fertilizers. Climate Change. The company derives substantial revenues from the sale of coal or oil and its derivative fuel products, or the company derives substantial revenues indirectly from the combustion of coal or oil and its derivative fuel products. Such companies include electric utilities, transportation companies with fleets of vehicles, auto and truck manufacturers, and other transportation equipment companies. Other Concern. The company has been involved in an environmental controversy that is not covered by other KLD ratings.

HUMAN RIGHTS

STRENGTHS. Indigenous Peoples Relations Strength. The company has established relations with indigenous peoples near its proposed or current operations (either in or outside the U.S.) that respect the sovereignty, land, culture, human rights, and intellectual property of the indigenous peoples. Labor Rights Strength. The company has outstanding transparency on overseas sourcing disclosure and monitoring, or has particularly good union relations outside the U.S. Other Strength. The company has undertaken exceptional human rights initiatives, including outstanding transparency or disclosure on human rights issues, or has otherwise shown industry leadership on human rights issues not covered by other KLD human rights ratings.

CONCERNS. Burma Concern. The company has operations or invest-

ment in, or sourcing from, Burma. Labor Rights Concern. The company's operations outside the U.S. have had major recent controversies related to employee relations and labor standards or its U.S. operations have had major recent controversies involving sweatshop conditions or child labor. Indigenous Peoples Relations Concern. The company has been involved in serious controversies with indigenous peoples (either in or outside the U.S.) that indicate the company has not respected the sovereignty, land, culture, human rights, and intellectual property of indigenous peoples. Other Concern. The company's operations outside the U.S. have been the subject of major recent human rights controversies not covered by other KLD ratings.

PRODUCT

STRENGTHS. Quality. The company has a long-term, well-developed, company-wide quality program, or it has a quality program recognized as exceptional in U.S. industry. R&D/Innovation. The company is a leader in its industry for research and development (R&D), particularly by bringing notably innovative products to market. Benefits to Economically Disadvantaged. The company has as part of its basic mission the provision of products or services for the economically disadvantaged. Other Strength. The company's products have notable social benefits that are highly unusual or unique for its industry.

CONCERNS. Product Safety. The company has recently paid substantial fines or civil penalties, or is involved in major recent controversies or regulatory actions, relating to the safety of its products and services. Marketing/Contracting Controversy. The company has recently been involved in major marketing or contracting controversies, or has paid substantial fines or civil penalties relating to advertising practices, consumer fraud, or government contracting. Antitrust. The company has recently paid substantial fines or civil penalties for antitrust violations such as price fixing, collusion, or predatory pricing, or is involved in recent major controversies or regulatory actions relating to antitrust allegations. Other Concern. The company has major controversies with its franchises, is an electric utility with nuclear safety problems, defective product issues, or is involved in other product-related controversies not covered by other KLD ratings. CONTROVERSIAL BUSINESS ISSUES ADULT ENTERTAINMENT Distributors. The report includes publicly traded U.S. companies that derive 15% or more of total revenues from the rental, sale, or distribution (wholesale or retail) of adult entertainment media products. Owners and Operators. The report includes publicly traded U.S. companies that own and/or operate adult entertainment establishment. Producers. The report includes publicly traded U.S. companies that produce adult media products including movies, magazines, books, calendars, and websites. Providers. The report includes publicly traded U.S. companies that offer pay-per-view adult entertainment. Ownership of an Adult Entertainment Company. The company owns more

than 20% of another company with adult entertainment involvement. (When a company owns more than 50% of company with adult entertainment involvement, KLD treats the adult entertainment company as a consolidated subsidiary.) Ownership by an Adult Entertainment Company. The company is more than 50% owned by a company with adult entertainment involvement. ALCOHOL Licensing. The company licenses its company or brand name to alcohol products. Manufacturers. Companies that are involved in the manufacture alcoholic beverages including beer, distilled spirits, or wine. Manufacturers of Products Necessary for Production of Alcoholic Beverages. Companies that derive 15% or more of total revenues from the supply of raw materials and other products necessary for the production of alcoholic beverages. Retailers. Companies that derive 15% or more of total revenues from the distribution (wholesale or retail) of alcoholic beverages. Ownership of an Alcohol Company. The company owns more than 20% of another company with alcohol involvement. (When a company owns more than 50% of company with alcohol involvement, KLD treats the alcohol company as a consolidated subsidiary.) Ownership by an Alcohol Company. The company is more than 50% owned by a company with alcohol involvement. FIREARMS Manufacturers. The company is engaged in the production of small arms ammunition or firearms, including, pistols, revolvers, rifles, shotguns, or sub-machine guns. Retailers. The company derives 15% or more of total revenues from the distribution (wholesale or retail) of firearms and small arms ammunition. Ownership of a Firearms Company. The company owns more than 20% of another company with firearms involvement. (When a company owns more than 50% of company with firearms involvement, KLD treats the firearms company as a consolidated subsidiary.) Ownership by a Firearms Company. The company is more than 50% owned by a company with firearms involvement. GAMBLING Licensing. The company licenses its company or brand name to gambling products. Manufacturers. Companies that produce goods used exclusively for gambling, such as slot machines, roulette wheels, or lottery terminals. Owners and Operators. Companies that own and/or operate casinos, racetracks, bingo parlors, or other betting establishments, including casinos; horse, dog, or other race tracks that permit wagering; lottery operations; on-line gambling; pari-mutuel wagering facilities; bingo; Jai-alai; and other sporting events that permit wagering. Supporting Products or Services. Companies that provide services in casinos that are fundamental to gambling operations, such as credit lines, consulting services, or gambling technology and technology support. Ownership of a Gambling Company. The company owns more than 20% of another company with gambling involvement. (When a company owns more than 50% of company with gambling involvement, KLD treats the gambling company as a consolidated subsidiary.) Ownership by a Gambling Company. The company is more than 50% owned by a company with gambling involvement. MILITARY Manufacturers of Weapons or Weapons Systems. Companies

that derive more than 2% of revenues from the sale of conventional weapons or weapons systems, or earned $50*million* or more from the sale of conventional weapons or weapons systems, or earned $10*million* or more from the sale of nuclear weapons or weapons systems. Manufacturers of Components for Weapons or Weapons Systems. Companies that derive more than 2% of revenues from the sale of customized components for conventional weapons or weapons systems, or earned $50*million* or more from the sale of customized components for conventional weapons or weapons systems, or earned $10*million* or more from the sale of customized components for nuclear weapons or weapons systems. Ownership of a Military Company. The company owns more than 20% of another company with military involvement. (When a company owns more than 50% of company with military involvement, KLD treats the military company as a consolidated subsidiary.) Ownership by a Military Company. The company is more than 50% owned by a company with military involvement. NUCLEAR POWER Ownership of Nuclear Power Plants. Companies that own nuclear power plants. Ownership of a Nuclear Power Company. The company owns more than 20% of another company with nuclear power involvement. (When a company owns more than 50% of company with nuclear power involvement, KLD treats the nuclear power company as a consolidated subsidiary.) Ownership by a Nuclear Power Company. The company is more than 50% owned by a company with nuclear power involvement. TOBACCO Licensing. The company licenses its company name or brand name to tobacco products.Manufacturers. The company produces tobacco products, including cigarettes, cigars, pipe tobacco, and smokeless tobacco products. Manufacturers of Products Necessary for Production of Tobacco Products. The company derives 15% or more of total revenues from the production and supply of raw materials and other products necessary for the production of tobacco products. Retailers. The company derives 15% or more of total revenues from the distribution (wholesale or retail) of tobacco products. Ownership of a Tobacco Company. The company owns more than 20% of another company with tobacco involvement. (When a company owns more than 50% of company with tobacco involvement, KLD treats the tobacco company as a consolidated subsidiary.) Ownership by a Tobacco Company. The company is more than 50% owned by a company with tobacco involvement.