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Corporate Social Responsibility and corporate performance: evidence from a panel of US listed companies

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Abstract
We investigate whether inclusion and permanence in the Domini social index affects corporate performance on a sample of around 1,000 firms in a 13-year interval by controlling for size, industry, business cycle and time invariant firm idiosyncratic characteristics. Our results find partial support to the hypothesis that corporate social responsibility is a move from the shareholders wealth to a multi-stakeholders welfare target. On the one side, permanence into the Domini index is shown to increase (reduce) significantly total sales per employee (returns on equity but not when large and R&D investing firms are excluded from the sample). On the other side, lower returns on equity for Domini firms seem nonetheless to be accompanied by relatively lower conditional volatility and lower reaction to extreme shocks with respect to the control sample.
An explanation for these findings, suggested by the inspection of Domini criteria, is that social responsibility implies, on the one side, decisions leading to higher cost of labour and of intermediate output, but may, on the other side, enhance involvement, motivation and identification of the workforce with company goals with positive effects on productivity.

Key words: social responsibility, stakeholders, corporate performance.

JEL classification codes: M14, L21.

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1. Introduction

A first minimal definition of social responsibility is generally related to the corporate choice of not breaching laws and regulations when pursuing shareholders’ wealth maximisation goals. A second approach considers that CSR is more than just following the law (McWilliams & Siegel, 2001), as it also involves actions which are expected to affect positively an identifiable social stakeholder’s welfare. Our analysis is aimed at measuring the impact of this second definition of CSR on corporate performance.

The debate on the relevance and effects of this second type of corporate social responsibility is polarised around two opposite perspectives. A first one considers CSR as a violation of manager’s mandatory duties, when it materialises into arbitrary management of "free cash flow" and higher expenditures which reduce shareholders’ wealth (Friedman, 1962). The reasoning of Friedman (1962) implies an efficient balance of powers between profit maximizing firms and social welfare maximizing institutions, which is far from the reality of our economic systems. Asymmetric information, agency costs and conflicts of interests are so widespread in our imperfect economic environment and institutions are distant from the benevolent planners depicted by theoretical models of some decades ago. All this considered, an important argument for the relevance of CSR comes from the observation that, in a society riddled by conflicts of interests and informational asymmetries, with weak institutions and incomplete contracts, the tenet of shareholders wealth maximization may be socially and environmentally untenable if corporate power is not offset by proper checks and balances from institutional action.

In the current “three-pillar” (institutions, corporations and the civil society) system what we observe are stakeholders creating bottom-up pressures on corporations in order to compensate institutional weaknesses in designing rules which should align firm behaviour to the goal of socially

2 “Few trends could so thoroughly undermine the very foundations of our free society as the acceptance by the corporate officials of a social responsibility other than to make as much money for their shareholders as possible”.

and environmentally sustainable development (Adriani and Becchetti, 2004). This pressure induces corporations to signal their social responsibility in order to minimize attrition with stakeholders. In this framework, CSR often originates not from an autonomous decision of managers, but from external pressures from consumers or institutions.

Well aware of these linkages between corporations, institutions and consumers, a different and broader view on CSR considers the social role of corporations and their relationship not just with shareholders, but with the larger set of firm stakeholders. In this perspective Freeman (1984) emphasizes that, if stakeholders have voice, the socially responsible behaviour of corporations may be a rational strategy to minimize conflicts and optimize synergies in their complex network of relationships with various stakeholders (local communities, consumers, environmentalist associations, subcontractors, etc.).

On this line Tirole (2001) argues that the concept of stakeholder value recognizes that corporate activity may create negative externalities which need to be counterbalanced, either by institutional rules or by corporations themselves. In such case, creating shareholders’ value is not enough to maximize total welfare and management should aim at “maximizing the sum of various stakeholder surpluses.” He is though sceptical on the possibility of creating incentives which can induce managers to behave in a socially responsible way. First, he observes that the difficulty of measuring SR fosters managerial opportunistic behaviour. Second, he argues that a SR company, by definition, should shifts its focus from the maximisation of shareholders’ wealth to a multi-stakeholders welfare approach. The consequence of this move may be a relatively lower return on equity which may make her object of a takeover from a profit maximising raider.

A first reply to Tirole (2001) is that several social labelling organisations have born to overcome informational asymmetries in this field. Hence, a corporation is nowadays considered as being socially responsible not just when it claims to be as such, but only if it complies with a set of externally fixed behavioural criteria. Opportunistic behaviour is obviously always a temptation but

(…)If businessmen do have social responsibility other than making maximum profits for stockholders, how are they
external monitoring and reputational costs from being caught cheating on SR may be a strong deterrent. The second Tirole's objection (takeover risk) is an interesting one and is somewhat related to our empirical research aimed at verifying whether SR firms create relatively more or less shareholder value than the rest of the economy.

Overall, an interesting issue in the above mentioned debate on CSR is that CSR may definitely be a superior corporate behaviour in terms of social welfare if the expected reduction of negative externalities is accompanied by a creation of aggregate economic value (and not merely shareholder return) equal or superior to that of non socially responsible firms. If this is true, a powerful incentive for corporations to adopt a SR attitude, beyond enlightened altruism, exists. This is why the evaluation of the effects of SR on corporate performance is a relevant topic in the current literature on CSR.

Our paper focuses on this issue and is divided into seven sections (including introduction and conclusions). The second section discusses the expected costs and benefits arising from the adoption of a SR behaviour. The third section briefly surveys the empirical literature on the effects of SR on corporate performance. The fourth section analyses SR criteria of a widely acknowledged standard (the Domini index which will be the benchmark of our empirically analysis) focusing in particular on their potentially cost increasing and productivity enhancing characteristics. The fifth section presents and comments our descriptive and econometric findings on the impact of entry, permanence and exit from the Domini index of SR. The sixth section analyses whether the lower return on equity of SR firms is compensated by reduced conditional volatility of SR firms stock returns.

2. Expected costs and gains from socially responsible behaviour

_to know what it is? Can self private individuals decide what the social interest is?_” (Friedman, 1962)
Before testing directly the impact of SR on corporate performance we briefly survey theoretical grounds which might support the hypothesis of a non negative relationship between SR and corporate performance. As a starting point we must consider - as it will be clear from the analysis of the characteristics of Domini criteria - that SR involves the undertaking of a set of actions which are potentially cost increasing (such as higher attention to workers conditions within the firm and in subcontracting companies, adoption of more environmentally, and often more costly, productive processes, etc.).

These sources of additional costs need to be compensated by some potential benefits to be economically sustainable. A first one, already mentioned, is represented by the creation of reputational capital which may help the company to obtain more favourable terms of trade when negotiating with various stakeholders (Cornell and Shapiro, 1987; Bowen et al., 1995; Jones, 1995).

A second one considers that SR may positively affect workers productivity if we move away from the standard microeconomic approach which regards labour productivity as solely related to individual skills, human capital and expected remunerations. In this perspective, a new strand of the literature starts modelling workers productivity as being affected not just by the usual set of individual worker variables, but also by intrinsic motivation, coworkers behaviour or working conditions, and by the workers identification with the goals of their firm (Agell and Lundberg, 1999; Bewley, 1999, Campbell and Kamlani, 1999). Social preferences\(^3\) (Fehr- Schmidt, 1999; Fehr and Schmidt, 2001; Sobel 2001) and gift exchange models (Akerlof, 1982) are two leading fields in this literature.

In this perspective, it is possible that the move to (exit from) CSR may significantly increase (reduce) intrinsic workers motivation, thereby affecting positively (negatively) their productivity.

3. The empirical literature on the impact of CSR

\(^3\) According to a definition of Fehr and Falk (2002) "a person exhibits social preferences if it does not only care about the material resources allocated to it but also cares about the material resources allocated to other relevant reference agents".
A huge number of empirical papers have tested in the past the relationship between social responsibility and corporate performance. Strangely enough, almost all of these papers have been published in the business and not in the economics literature, even though the topic of CSR is obviously relevant for both.

This “anomaly” gives us the advantage of providing an original contribution to this specific field by testing the relationship between the two variables with methodological approaches which are standard in economics, but are not always used in the business literature.

With some approximation we can divide the existing empirical papers into three groups.

The first finds a positive relationship between CSR and corporate performance. Soloman and Hansen (1985) find that the costs of having a high level of CSR are more than compensated by benefits in employee morale and productivity. Pava and Krausz (1996) and Preston and O’Bannon (1997) observe that CSR is positively associated with financial performance, while positive synergies between corporate performance and good stakeholders relationships are found by Stanwick and Stanwick (1998) and by Verschoor (1998). Ruf et al. (2001) find that change in CSR is positively associated with growth in sales and that returns on sales are positively associated with CSR for three financial periods. Simpson and Kohers (2002) document a positive link between social and financial performance on a sample of banking firms.

A second group of papers finds no significant direction in the link between CSR and corporate performance. Mc Williams and Siegel (2001) observe that the financial performance of the Domini index constituents is not significantly different from that of a control sample when per capita R&D expenditure is added among regressors. Other papers finding inconclusive results are those of Anderson and Frankle (1980), Freedman and Jaggi (1986) and Aupperle, Caroll and Hatfield (1985).

A third group of contributions documents a negative relationship between CSR and corporate performance which is consistent with the managerial opportunism hypothesis. Preston and
O’Bannon (1997) suggest that managers reduce expenditures on social performance to increase short-term profitability and their personal compensation, but, when financial performance is poor, they divert attention by expenditures on social programs. Other papers documenting a negative relationship are those of Freedman and Jaggi (1982), Ingram and Frazier (1983), Waddock and Graves (1997).

How to interpret these controversial results? In the well known story about the blind men and the elephant each blind man can get only part of the truth by touching a part of the body of the elephant. The group of blind men acquires reasonable knowledge of the phenomenon under investigation (the elephant) only when the partial and insufficient information collected by each individual is pooled. The story suggests that the above described differences in findings across the three groups of papers do not necessarily reflect mistakes or inaccuracies, but, most often, differences in perspective (observation periods, companies included in the sample, measures of corporate performance and methodological approaches adopted for the empirical analysis). It also suggests that the combination of them, or an empirical research broadening the scope of the analysis and integrating many of these perspectives, may give us a more complete picture of the effects of SR on corporate performance (our “elephant”).

Our paper follows this direction as it aims to implement the existing research in the field from several points of view. First, it uses panel data and takes into account a significantly long time period, controlling for business cycle effects with year dummies and for spurious correlations between variables with cointegrating panel techniques. Second, it introduces firm specific intercepts (fixed effects), thereby separating the impact of CSR from time invariant, firm idiosyncratic, characteristics. Third, it explores the impact of exit from CSR with specific reference to a range of different motivations (labour relationships, sales of weapons, corporate governance, environment) on corporate performance. Fourth, it proxies the relative risk of holding CSR stocks by testing for the difference in conditional volatility and in its reaction to shocks between CSR and control sample stocks.
4. The Social domini criteria

The Domini Social Index 400 (DSI 400) developed by Kinder, Lydenberger and Domini has created a series of widely acknowledged SR criteria which gradually became an international standard. These criteria determine the inclusion of stocks into the index itself and, with it, the opportunity of being selected in portfolios of ethical funds.

Social domini criteria are divided into eight big domains: i) community; ii) corporate governance; iii) diversity; iv) employee relations; v) environment; vi) human rights; vii) product quality; viii) 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 the two (see Appendix 1).

4.1 Domini requirements with cost increasing potential

The inspection of these criteria immediately shows that there are no “free lunches” in SR, revealing how several SR actions are clearly cost-increasing. In the community section we find as strengths charitable giving, support for education and support for housing. In the diversity section we find work benefits (the company has outstanding employee benefits or other programs addressing work/life concerns, e.g. childcare, eldercare or flextime). In the employee relations section we find as strengths cash profit sharing programs, health and safety strength and strong retirement benefit...

---

4 The index methodology presents advantages and drawbacks. Its advantages are that it reflects historical concerns of investors, keeps track of CSR evolution in time and includes all dimensions identified as important in CSR. Its first limit is the absence of a measure of intensity in corporate performance. Another important problem with the index is in the adoption of a “best in class process” in which relative, but not absolute, best SR performers in some industries have been included with the specific aim of keeping the index sufficiently diversified, thereby allowing ethical fund investors to adopt well diversified passive investment strategies. Finally, a third limit is that the index must have a constant number of constituents. Therefore, for any exit a new entry is needed, with the effect that entry timing is determined not solely by firm progress on CSR, but also by rebalancing needs.

5 The weight of these funds in financial markets is growing considerably. According to 2003 Report on Socially Responsible Investing Trends in the United States the industry of ethically managed mutual fund assets represented $2.16 trillion dollars when including all US private and institutional ethically screened portfolios. Based on these figures one out of nine dollars under professional management in the United States was part of socially responsible portfolios.
programs. In the environment section we find as strengths clean air programs. This item is for companies which have taken 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 for companies that have demonstrated a commitment to promoting climate-friendly policies and practices outside its own operations. The impact of these measures on costs is not necessarily positive, but it is highly suspected to be so. In the human right section we find the item of 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.). Here again, good relationships with local workers and stakeholders are expected to have some costs in terms of missed opportunities of labour cost reductions.

4.2 Domini requirements with cost decreasing (or productivity enhancing) potential

Against all these potentially cost increasing factors we find only one clearly cost-decreasing SR initiative in the corporate governance section (the limited compensation of the manager) and a profit or productivity enhancing domain related to product quality.

On the other hand, our inspection of Domini affiliation also suggests that some of the same cost increasing items commented above may have a dual effect including, on the positive side, the capacity of increasing workers participation and productivity. First, limits to managerial compensation may increase workers’ satisfaction if the latter have inequality aversion in their preferences. Second, the presence of a program of Work/Life Benefits (the company has
outstanding employee benefits or other programs addressing work/life concerns, e.g. childcare, eldercare or flextime) may increase workers involvement with the company.

Last but not least, a positive reaction of workers in terms of productivity may also be generated by strength factors in the employee relations section. These are: 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).

The goal of our paper is to test whether the cost increasing factors related to CSR (and, specifically, to Domini affiliation) prevail over the factors which should increase workers motivation and lead to higher productivity. Furthermore, we want to evaluate whether, as it is implicit in its same characteristics, CSR choice may lead to some forms of redistribution of corporate value from shareholders to stakeholders.

5.1 The econometric specification and descriptive findings

In order to test the impact of Domini affiliation on corporate performance we choose the following specification:

\[
Y_t = \alpha_0 + \gamma_t + \alpha_1 \log(\text{Size}) + \alpha_2 \text{Domini} + \alpha_3 \text{Entry} + \alpha_4 \log(\text{Postexit}) + \sum_{k=0}^{n-1} \beta_k \text{Reasexit}_k + \sum_{i=1}^{w-1} \delta_i \text{Year}_i + \epsilon_t
\]

(1)
where $Y_{it}$ is a chosen performance variable (e.g., return on equity, return on capital employed,⁶ total sales per employee), $\gamma_i$ is the time invariant firm idiosyncratic (fixed) effect, \(\text{Size}\) is the number of firm employees, \(\text{Domini}\) is a (zero/one) dummy measuring affiliation to the Domini 400 index; \(\text{Entry}\) is a dummy which takes the value of one in the year of entry into the Domini 400 index and zero otherwise; \(\text{Postexit}\) is a variable measuring the number of years following exit from the Domini 400 index; \(\text{Reasexit}_k\) is the \(k^{th}\) dummy taking the value of one in the year of exit when the specific exit rationale (\(\text{Military, Environment, Productquality, Badgovnce and Badlabour}\)) applies. Finally, \(\text{Year}_t\) is a year \(t\) dummy picking up year effects.

In our estimate we therefore try to disentangle the effects of corporate social responsibility (proxied by Domini affiliation) from business cycle effects (year dummies) and idiosyncratic characteristics (e.g., management quality) of each firm (proxied by the fixed effect measured through the firm specific intercept component \(u_i\)).

To provide an example of the relevance of this approach, it may happen that the association of Domini affiliation with a positive performance in a given dependent variable depends from the fact that high performers are more likely to search for Domini affiliation than low performers. In this case the causation would be reversed with good performance causing Domini affiliation and not vice versa. In our estimate fixed effects should capture differences in ex ante characteristics and the Domini variable should measure just the net effect of CSR.

The use of fixed effect controls for measurement errors arising from the use of industry dummies as well. The identification of firm specific characteristics goes in fact deeper than the identification of industry characteristics, since industry classifications are becoming always more imperfect taxonomies for firms with increasingly diversified product mix.

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⁶ Return on capital employed is equal to \(\text{Operating income/(Shareholders’ equity + Interest bearing liabilities)}\). Its advantage is that it includes in the denominator and indicator which depends on firm indebtedness and therefore does not suffer, like ROE, of sensitiveness to firm leverage (i.e., highly leveraged firms tend, by definition, to have significantly higher ROE than non highly leveraged ones).
Table 1 presents preliminary descriptive findings on the distribution of variables used for the econometric analysis showing that the median value for ROI (ROE) is around 10 (15) percent and that more than 5 (10) percent of ROI (ROE) observations are negative.

Table 2 illustrates descriptive findings on the distribution of the dependent variables selected for the econometric analysis according to the three subgroups of firms which are never (non domini), always (sempredomini) or, at some moment in the observation period, (domini) in the Domini index. The analysis is provided for the overall sample and for the size and R&D/non R&D investing subsamples which we will consider also in the econometric analysis. A relevant finding is that average non domini total sales per employee (return on equity) are (is) always lower than in the sempredomini subgroup with the exception of the small cap (large cap) subsample. Overall, descriptive findings do not help much in obtaining a clear cut picture of the impact of SR on corporate performance and econometric analysis is needed to disentangle ex ante identity from Domini affiliation effects.

5.2 Results from econometric analysis

The standard techniques applied to time series require, before estimating a model, that series are I(0) or, if not, that they have at least one cointegrating vector. This is to avoid that significant relationships between the dependent variable and the regressors are led by spurious correlations. These techniques are now being applied also to the time dimension of individuals in panels. The application of these techniques to panel data is complex and requires the formulation of joint hypotheses on the stationarity of the time series of each of the individuals (in our case firms) being part of the panel.

We first test for the stationarity of non discrete series in our estimates (firm size, net sales per worker, return on equity, on investment and on capital employed) by using the Fisher’s test, developed by Maddala and Wu (1999), based on the p-values from N independent unit root tests.
The null hypothesis assumes that all series are non stationary. The test has two alternatives. The homogeneous alternative (all series are stationary) and the heterogeneous alternative (some series are stationary and some others are not). The null hypothesis is rejected for our dependent variables (see Table 3.1).

The problem is that with the Fisher test we cannot discriminate between the homogeneous and the heterogeneous alternative. For this reason we add the Im-Pesaran-Shin (2003) diagnostic in which the null hypothesis that all series are nonstationary is tested against the heterogeneous alternative.7 The test does not lead to the rejection of this hypothesis for the net sales and net cash flow per employee series. The finding is consistent with the result of the Fisher test performed on individual (firm) series of the additional continuous variables (such as firm size) showing in some cases stationarity and in some others non stationarity.8

Once verified the existence of nonstationarity in at least some of the time dimensions of our individual firm series, we can still perform a regression in levels with these variables if we find the presence of common stochastic trends (i.e. of cointegration). To check for it we use the Nyblom and Harvey (2000) test which has the advantage of allowing for serial correlation in residuals and of not requiring any model to be estimated.9 The test rejects the null hypothesis of absence of common stochastic trends under the assumption of non IID standard errors (NH adj. t in Table 3.2), thereby identifying the presence of cointegrating vectors which allow us to estimate the model in levels.

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7 Among authors emphasizing the importance of testing for panel cointegration to avoid spurious regressions in panel estimates see Gerdtham and Lothgren (2002) and Okunade and Karakus (2001). The latter also provide one of the earlier applications of the Im et al. (2003) test which is performed also in this paper. For an application of panel cointegration to financial ratios see Peel et al. (2004)
8 Omitted for reasons of space and available from the authors upon request.
9 The test does not require model estimates because is based on the rank of covariance matrix of the disturbances driving the multivariate random walk. If this rank is equal to a certain number of common trends, this implies the presence of cointegration and vice-versa. If the rank is equal to zero, as in the null hypothesis, then there are no common trends among the variables. Thus, failure to reject the null hypothesis of zero common trends is also an indication that the variables do not form a cointegrated combination.
A first important result of the estimates presented in tables 4.1-4.4 shows that the joint insignificance of the fixed effects is rejected, confirming that idiosyncratic factors matter and their omission is likely to bias empirical findings.

Our empirical findings document that permanence into Domini index is associated with 13 percent higher total sales per employee after controlling for size, business cycle effects and idiosyncratic firm characteristics (Table 4.1, column 1). The positive total sales performance is consistent (even though not coincident) with findings from Stanwick and Stanwick (1998), Verschoor (1998) and Ruf et al. (2001) mentioned in section 3. In the same estimate we find that doubling the years after Domini exit reduces total sales per employee by 23 percent in the overall sample and is associated with a significantly reduced performance (around 21, 23 and 23 percent respectively for each of the three profitability indicators, ROI, ROE and ROCE) (Table 4.1, columns, 2, 3 and 4). These findings are not at odds with the Friedman (1984) hypothesis that CSR helps to reduce transaction costs with stakeholders but may be also explained by a distress factor which affect both performance and exit from the Domini.

Columns 2 to 4 (table 4.1) show that Domini affiliation is associated with a reduction of return on investment, return on equity and return on capital employed of around 10, 6 and 10 percent respectively. Note that the effect of Domini affiliation on ROE is not significant in the overall sample estimate but that it becomes so when large or R&D investing firms are excluded from the sample (Tables 4.2-4.6). This negative effect is compensated by the positive impact of entry into the Domini index on ROI and ROCE in the estimates in which large caps are excluded from the sample (table 4.2). More generally, estimates in Table 4.2 in which large caps are excluded from the sample reveals an overall deterioration of the Domini effect since the positive impact on total sales disappears and the negative effect on profitability indicators become stronger.

Moreover, negative post exit effects on profitability indicators seem to exist (and to be stronger) for non large capitalisation firms (around 62 percent lower return on capital employed and 60 percent lower return on investment) (table 4.2).
When we reestimate the model for non R&D investing firms only the results of the overall sample are confirmed with some slight differences: i) Domini affiliation has a significant effect on total sales per worker even when large caps are excluded from the sample (16 percent with large caps and 9 percent without large caps) (tables 4.3 and 4.4, column 1); ii) the negative effects of Domini affiliation on profitability indicators tends to be larger in these subsamples (tables 4.3 and 4.4, columns 2 to 4).

Overall, findings reported in tables 4.1-4.4 outline a picture in which SR seems consistent with the shift in focus from shareholders wealth maximisation to a multistakeholders welfare approach. SR firms productivity is equal or, in some cases, significantly higher than in the control sample while, at the same time, return on equity is significantly lower. These findings clearly match with our interpretation of SR criteria described in section 4. Such criteria are shown to generate transfers of wealth to stakeholders and workers, but are also interpreted as having the potential effect of increasing workers motivation and productivity.

To control further for endogeneity and reverse causation we wonder whether some permanent characteristics distinguish Domini affiliated firms from the control sample or, in other terms, if firms which will be included in the Domini index are idiosyncratically different in quality with respect to the control sample.

We therefore test whether average fixed effects for the control sample and for firms which are in the Domini index at some moment in our sample interval are significantly different. Our findings (last rows of tables 4.1-4.6) show that SR firms have significantly higher net sales and return on investment fixed effects before and after controlling for size and industry effects (in all of the six estimated samples) in the overall and in all subgroup estimates. The difference between fixed effects of Domini and non Domini firms is not significant in the return on equity estimate. Our interpretation is that Domini affiliation significantly reinforces traits of corporate identity which were already in place before entry. Summing up all our findings we are led to conclude that: i) SR firms have ex ante higher total sales per worker and higher return on investment, ii) their
permanence into the Domini index generates a new significant independent effect in one case consistent (higher total sales per worker) and in another not consistent (lower return on equity) with ex ante characteristics.

6. Domini affiliation and conditional stock return volatility

The relatively lower ROE of SR firms does not necessarily mean that SR stocks are not a good business. The comparative performance of equities must be obviously evaluated on the risk-return perspective. In this perspective, relatively lower returns on equity of SR firms may be compensated by relatively lower risk. Following Boccardelli and De Santo (2005) we test the relative risk of a buy-and-hold investment strategy on our SR stocks vis à vis the same strategy on our control sample by building an index of stock returns for the two subsamples and estimate their conditional volatility with a simple GARCH (1,1) (Nelson, 1989; Engle, 1990; Engle and Ng, 1993).

The chosen specification for stock return behaviour (mean equation) is:

\[ R_t = \alpha_0 + \sum_j \gamma_j R_{t-1} + \sum_j \beta_j DW_j + \delta DJ + \varepsilon_t \]  

(2)

where \( R_t \) is the average subgroup (SR or control sample) one-day compounded return, \( DW_j \) is the j-th dummy measuring “day of the week” effects, \( DJ \) is a dummy for “January” effect and \( \varepsilon_t \approx (0, h_t) \) is the error term.

The standard specification adopted for testing the asset market volatility in the second (variance) equation of a GARCH (1,1) model is given by:

\[ h_t = b_0 + b_1 \varepsilon_{t-1}^2 + b_2 h_{t-1} \]  

(3)

10 Preliminary tests on normality and ARCH LM tests show that observed returns are non normal and have an ARCH structure. More complex (asymmetric, nonlinear) conditional heteroskedasticity models have also been estimated giving results which are not substantially different in terms of the effect of SR. Results are omitted for reasons of space and available upon request.
where \( h_t \) is the conditional variance of the error term in (2), \( \varepsilon_{t-1}^2 \) measures the impact of news on conditional variance and \( h_{t-1} \) is the conditional variance autoregressive component which measures persistence of the dependent variable.

Mean equations for the two (Domini and control sample) indexes (table 5) have some common elements. One period lagged daily log returns have small but significant effects on the dependent variable. Moreover, the control sample (non SR firms) exhibits also a negative and significant Monday effect, consistently with several previous results in literature (Taylor, 1986).

Kurtosis and skewness tests, performed on the residuals obtained from the best estimation of the base equations, show that the distribution is not normal. The existence of excess kurtosis confirms the “stylized fact” of thick tails for financial time series, which was firstly observed by Mandelbrot (1963 a, b). The sum of the ARCH and GARCH coefficients is very close to one, indicating that volatility shocks are quite persistent (but lower than one).

A relevant finding is that 95 percent confidence intervals of the first equation intercept overlap and therefore we find no difference in excess returns between the SR and the non SR portfolios.

The main differences between the two indexes are that the Monday effect is significant and negative only in the control sample index and that the intercept in the second equation is significantly lower (at 90 percent) for the Domini index. Figure 1 plots conditional volatility for the two indexes and confirms that the conditional volatility of the Domini index is almost always lower than that of the control sample index.

The quality of the SR index is not just that of having relatively lower conditional volatility but also that of having a significantly reduced volatility reaction to large shocks. In Table 6 the model is reestimated by adding a dummy which tests the change in conditional volatility after the burst of the Nasdaq stock market bubble in March 2000. The approach used for evaluating the impact of changes in stock price volatility after news’ releases or regime shifts follows previous research from Choi and Kim (2002), Crain and Lee (1996), Becchetti and Caggese (2000) and Wang et al. (2002).
Our findings show in this case that the impact is significantly lower in the social responsibility index.

A possible interpretation of this result hinges upon the different nature of those investing SR and non-SR portfolios. According to the 2003 Report on Socially Responsible Investing Trends in the United States, the highest growth component (80 percent) in the growth of assets involved in social investing from 1995 to 2003 has been that of community investing. The nature of the latter, and generally of most SR investors, is therefore expected to be “more patient” and long-term oriented with respect to non-SR investors. An indirect evidence of it is provided in the same report by the comparison of the accumulated equity fund flows of SR and non-SR funds in the US between January 2001 and May 2003 where we assist to a constant growth in the stock of SR fund assets compared to a sharp drop in the non-SR funds in the mid of this period.

7. Conclusions

Corporate social responsibility is a multifaceted complex phenomenon involving a set of actions which are expected to affect significantly cost structures and workers participation to productive activity. As a consequence, the scope of empirical investigations on the effects of CSR on corporate performance must be such that the highest number of hidden dimensions of the problem can be discovered and analysed.

This paper tries to do so by enlarging the observed estimation period, by discriminating among different reasons for entry or exit from a selected measure of CSR and by controlling for business cycle effects and for time invariant idiosyncratic characteristics of the observed firms.

Our empirical approach allows us to disclose many unexplored dimensions of the CSR/corporate performance relationship.

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11 Community development financial institutions primarily provide loan financing to businesses in areas that need economic development. CDFIs make loans that are generally "unbankable" by traditional industry standards because of past credit problems, the size of the loan request, limited equity from founders or limited collateral.
Our findings are consistent with the hypothesis that CSR is expected, in principle, to redirect the focus of corporate activity from the maximization of shareholders to that of stakeholders interests. We observe in fact that workers in SR firms produce “larger cakes” (total sales per employee are significantly higher), but a smaller portion of these cakes goes to shareholders (returns on equity are significantly lower when large caps or R&D investing firms are not in the sample and returns on capital invested and on investment are always lower). The “penalty” that social responsibility imposes on shareholders (relatively lower return on equity) seems to be compensated by reduced conditional volatility of SR vis à vis the control sample. In fact, if the ROE of socially responsible firms is significantly lower when we exclude large firms from the sample, risk adjusted returns of the SR portfolio are not significantly different from those of the control sample.

A second robust finding is the significantly negative impact (both in terms of productivity and return on equity) of exit from the Domini index. This result documents negative consequences arising when a CSR stance is abandoned. Limits of our information do not allow to verify whether the event reveals an exogenous negative shock on firm competitiveness which also leads to exclusion from the Domini or whether the shock depends on reduced productivity of workers or on sanctions imposed by socially responsible consumers.
References


Boccardelli L., De Santo S., 2004, Social responsibility and reaction to stock market shocks, mimeo


Social investment forum, 2003 Report on Socially Responsible Investing Trends in the United States,


Table 1 Distribution for the variables selected for the empirical analysis

<table>
<thead>
<tr>
<th>Centile</th>
<th>TOTALSALES (millions of $)</th>
<th>R&amp;D</th>
<th>ROI</th>
<th>ROE</th>
<th>ROCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>6.678</td>
<td>0.055</td>
<td>-31.820</td>
<td>-72.540</td>
<td>-0.022</td>
</tr>
<tr>
<td>5%</td>
<td>16.493</td>
<td>0.202</td>
<td>-5.200</td>
<td>-17.230</td>
<td>-0.001</td>
</tr>
<tr>
<td>10%</td>
<td>30.917</td>
<td>0.387</td>
<td>1.100</td>
<td>-3.250</td>
<td>0.000</td>
</tr>
<tr>
<td>25%</td>
<td>110.821</td>
<td>1.049</td>
<td>5.940</td>
<td>7.980</td>
<td>0.000</td>
</tr>
<tr>
<td>50%</td>
<td>274.595</td>
<td>4.279</td>
<td>10.305</td>
<td>15.190</td>
<td>0.001</td>
</tr>
<tr>
<td>75%</td>
<td>902.441</td>
<td>24.731</td>
<td>16.640</td>
<td>22.020</td>
<td>0.004</td>
</tr>
<tr>
<td>90%</td>
<td>4415.063</td>
<td>120.051</td>
<td>24.580</td>
<td>33.300</td>
<td>0.012</td>
</tr>
<tr>
<td>95%</td>
<td>11724.880</td>
<td>592.727</td>
<td>31.690</td>
<td>45.250</td>
<td>0.027</td>
</tr>
<tr>
<td>99%</td>
<td>56790.850</td>
<td>3629.195</td>
<td>58.670</td>
<td>129.600</td>
<td>0.169</td>
</tr>
</tbody>
</table>

Legend of variables: TOTALSALES: total sales per employee; R&D: Research and Development per employee; ROI: Return on Investment; ROE: Return on Equity; ROCE: Return on Capital Employed (where capital employed is Shareholders’ equity + Interest bearing liabilities).
Table 2 Descriptive statistics of variables used in the empirical analysis

<table>
<thead>
<tr>
<th>Overall sample</th>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>25th percentile</th>
<th>Median</th>
<th>75th percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sempredomini</strong></td>
<td>TSA</td>
<td>2846.29</td>
<td>13785.27</td>
<td>110.820</td>
<td>274.595</td>
<td>902.441</td>
</tr>
<tr>
<td></td>
<td>ROI</td>
<td>11.86</td>
<td>14.10</td>
<td>5.965</td>
<td>10.420</td>
<td>16.735</td>
</tr>
<tr>
<td></td>
<td>ROE</td>
<td>16.95</td>
<td>130.83</td>
<td>8.400</td>
<td>15.630</td>
<td>22.185</td>
</tr>
<tr>
<td></td>
<td>ROCE</td>
<td>0.01</td>
<td>0.05</td>
<td>0.000</td>
<td>0.001</td>
<td>0.004</td>
</tr>
<tr>
<td><strong>Domini</strong></td>
<td>TSA</td>
<td>2592.07</td>
<td>12715.38</td>
<td>123.147</td>
<td>279.125</td>
<td>844.246</td>
</tr>
<tr>
<td></td>
<td>ROI</td>
<td>11.54</td>
<td>14.32</td>
<td>5.940</td>
<td>10.305</td>
<td>16.640</td>
</tr>
<tr>
<td></td>
<td>ROE</td>
<td>19.10</td>
<td>222.12</td>
<td>7.975</td>
<td>15.190</td>
<td>22.020</td>
</tr>
<tr>
<td></td>
<td>ROCE</td>
<td>0.01</td>
<td>0.04</td>
<td>0.000</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>non domini</strong></td>
<td>TSA</td>
<td>2297.24</td>
<td>13520.69</td>
<td>62.469</td>
<td>212.598</td>
<td>667.719</td>
</tr>
<tr>
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<td>ROI</td>
<td>10.13</td>
<td>48.02</td>
<td>5.080</td>
<td>8.930</td>
<td>14.310</td>
</tr>
<tr>
<td></td>
<td>ROE</td>
<td>13.31</td>
<td>108.01</td>
<td>7.695</td>
<td>15.060</td>
<td>23.490</td>
</tr>
<tr>
<td></td>
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<td>0.00</td>
<td>0.12</td>
<td>0.000</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>Large Capitalization</strong></td>
<td><strong>Variable</strong></td>
<td><strong>Mean</strong></td>
<td><strong>Std. Dev.</strong></td>
<td><strong>25th percentile</strong></td>
<td><strong>Median</strong></td>
<td><strong>75th percentile</strong></td>
</tr>
<tr>
<td><strong>Sempredomini</strong></td>
<td>TSA</td>
<td>5624.811</td>
<td>21813.090</td>
<td>167.527</td>
<td>423.489</td>
<td>2635.587</td>
</tr>
<tr>
<td></td>
<td>ROI</td>
<td>11.798</td>
<td>15.581</td>
<td>5.720</td>
<td>10.170</td>
<td>17.270</td>
</tr>
<tr>
<td></td>
<td>ROCE</td>
<td>0.004</td>
<td>0.028</td>
<td>0.000</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>Domini</strong></td>
<td>TSA</td>
<td>4916.387</td>
<td>19391.450</td>
<td>192.632</td>
<td>434.342</td>
<td>2403.724</td>
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<tr>
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<td>ROCE</td>
<td>0.005</td>
<td>0.031</td>
<td>0.000</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>non domini</strong></td>
<td>TSA</td>
<td>4463.960</td>
<td>22966.450</td>
<td>185.655</td>
<td>482.402</td>
<td>1405.051</td>
</tr>
<tr>
<td></td>
<td>ROI</td>
<td>11.132</td>
<td>32.120</td>
<td>4.960</td>
<td>9.240</td>
<td>15.370</td>
</tr>
<tr>
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<td>ROE</td>
<td>21.703</td>
<td>71.852</td>
<td>9.365</td>
<td>17.450</td>
<td>24.085</td>
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<tr>
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<td>0.096</td>
<td>0.000</td>
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<td><strong>Small Capitalization</strong></td>
<td><strong>Variable</strong></td>
<td><strong>Mean</strong></td>
<td><strong>Std. Dev.</strong></td>
<td><strong>25th percentile</strong></td>
<td><strong>Median</strong></td>
<td><strong>75th percentile</strong></td>
</tr>
<tr>
<td><strong>Sempredomini</strong></td>
<td>TSA</td>
<td>1465.073</td>
<td>8823.862</td>
<td>78.301</td>
<td>179.284</td>
<td>512.615</td>
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<tr>
<td></td>
<td>ROE</td>
<td>17.630</td>
<td>100.865</td>
<td>7.650</td>
<td>13.670</td>
<td>21.140</td>
</tr>
<tr>
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<td>0.013</td>
<td>0.000</td>
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<td>0.006</td>
</tr>
<tr>
<td><strong>Domini</strong></td>
<td>TSA</td>
<td>1359.96</td>
<td>8446.275</td>
<td>74.395</td>
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<td>497.434</td>
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<td>0.020</td>
<td>0.000</td>
<td>0.002</td>
<td>0.006</td>
</tr>
<tr>
<td><strong>non domini</strong></td>
<td>TSA</td>
<td>1665.788</td>
<td>8791.105</td>
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<td>102.111</td>
<td>389.152</td>
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<td>ROI</td>
<td>8.577</td>
<td>25.349</td>
<td>5.167</td>
<td>9.055</td>
<td>13.807</td>
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<td>5.810</td>
<td>167.809</td>
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<td>0.035</td>
<td>0.000</td>
<td>0.001</td>
<td>0.004</td>
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Table 2 Descriptive statistics of variables used in the empirical analysis (follows)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>25th percentile</th>
<th>Median</th>
<th>75th percentile</th>
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<tbody>
<tr>
<td><strong>R&amp;D investing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sempredomini</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSA</td>
<td>2844.207</td>
<td>10047.78</td>
<td>115.897</td>
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<tr>
<td>ROI</td>
<td>11.962</td>
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<td>5.800</td>
<td>10.245</td>
<td>17.430</td>
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<tr>
<td>ROE</td>
<td>24.233</td>
<td>164.789</td>
<td>10.645</td>
<td>17.440</td>
<td>23.240</td>
</tr>
<tr>
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<td>0.032</td>
<td>0.000</td>
<td>0.001</td>
<td>0.003</td>
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<tr>
<td>domini</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSA</td>
<td>2553.322</td>
<td>9828.378</td>
<td>140.868</td>
<td>261.149</td>
<td>680.591</td>
</tr>
<tr>
<td>ROI</td>
<td>11.749</td>
<td>14.340</td>
<td>5.970</td>
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<td>17.670</td>
</tr>
<tr>
<td>ROE</td>
<td>34.378</td>
<td>420.077</td>
<td>9.800</td>
<td>17.240</td>
<td>23.465</td>
</tr>
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<td>0.033</td>
<td>0.000</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td>non domini</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSA</td>
<td>2345.778</td>
<td>12258.470</td>
<td>118.202</td>
<td>239.923</td>
<td>541.198</td>
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<tr>
<td>ROE</td>
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<td>74.726</td>
<td>8.485</td>
<td>15.530</td>
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<tr>
<td>ROCE</td>
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<td>0.001</td>
<td>0.004</td>
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<td><strong>Non R&amp;D investing</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sempredomini</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
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<td>0.049</td>
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<td>0.001</td>
<td>0.005</td>
</tr>
<tr>
<td>domini</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>294.169</td>
<td>927.001</td>
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<td>7.610</td>
<td>14.650</td>
<td>21.455</td>
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<tr>
<td>ROCE</td>
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<td>0.001</td>
<td>0.005</td>
</tr>
<tr>
<td>non domini</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSA</td>
<td>2277.920</td>
<td>13993.800</td>
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<td>719.731</td>
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<tr>
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<td>5.065</td>
<td>8.790</td>
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<tr>
<td>ROCE</td>
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<td>0.093</td>
<td>0.000</td>
<td>0.001</td>
<td>0.004</td>
</tr>
</tbody>
</table>

Legend of the dependent variables: TOTALSALES: total sales per employee; R&D: Research and Development per employee; ROI: Return on Investment; ROE: Return on Equity; ROCE: Return on Capital Employed.

SEMPREDOMINI: observations relative to firms being part of the Domini index throughout all the sample period; NONDOMINI: observations when sample firms are not part of the Domini index; DOMINI: observations when sample firms are part of the Domini index.
Table 3.1. Panel Unit Root Test

Fisher t-test: the null hypothesis is that all series are non stationary against the homogeneous alternative (all series are stationary) and the heterogeneous alternative (some series are stationary and some others are not).

IPS: Im, Pesaran and Shin (2003). The null hypothesis of the test is that all series are non stationary (H₀: ρᵢ=1) against the alternative heterogeneous hypothesis (H₁: ρᵢ<1 for each i=1,…,N₁ and ρᵢ=1 for each i=N₁+1,…,N for some N₁).

<table>
<thead>
<tr>
<th></th>
<th>Size</th>
<th>Net sales per worker</th>
<th>Net cash flow per worker</th>
<th>ROI</th>
<th>ROE</th>
<th>ROCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fisher t-test</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>t-bar</strong></td>
<td></td>
<td>-0.774</td>
<td>-3.312</td>
<td>-2.112</td>
<td>-2.691</td>
<td>-2.331</td>
</tr>
<tr>
<td><strong>Critical Value 10%</strong></td>
<td></td>
<td>-1.64</td>
<td>-1.64</td>
<td>-1.64</td>
<td>-1.64</td>
<td>-1.64</td>
</tr>
<tr>
<td><strong>Critical Value 5%</strong></td>
<td></td>
<td>-1.67</td>
<td>-1.67</td>
<td>-1.67</td>
<td>-1.67</td>
<td>-1.67</td>
</tr>
<tr>
<td><strong>Critical Value 1%</strong></td>
<td></td>
<td>-1.73</td>
<td>-1.73</td>
<td>-1.73</td>
<td>-1.73</td>
<td>-1.73</td>
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<tr>
<td><strong>W-bar</strong></td>
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<tr>
<td><strong>p-value</strong></td>
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<td>0.005</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 3.2 Panel Cointegration Test by Nyblom and Harvey (2000)

The null hypothesis of the test is no cointegration (H₀: rang(var-cov)=K=0) against the alternative hypothesis of cointegration (H₁: rang(var-cov)=K ≠ 0).

NH-t: the test is performed under the hypothesis of iid errors. Nh adj-T: errors are allowed to be serially correlated, and the test is performed using an estimate of the long-run variance derived from the spectral density matrix at frequency zero.

<table>
<thead>
<tr>
<th></th>
<th>Size</th>
<th>Net sales per worker</th>
<th>Net cash flow per worker</th>
<th>ROI</th>
<th>ROE</th>
<th>ROCE</th>
</tr>
</thead>
<tbody>
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<td></td>
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</tr>
<tr>
<td><strong>NH-t</strong></td>
<td>7.4667</td>
<td>8.412</td>
<td>7.153</td>
<td>9.152</td>
<td>8.195</td>
<td>9.003</td>
</tr>
<tr>
<td><strong>NH adj-t</strong></td>
<td>44.800</td>
<td>41.230</td>
<td>38.450</td>
<td>47.250</td>
<td>41.330</td>
<td>41.360</td>
</tr>
<tr>
<td><strong>Critical Value 10%</strong></td>
<td></td>
<td>18.36</td>
<td>18.36</td>
<td>18.36</td>
<td>18.36</td>
<td>18.36</td>
</tr>
<tr>
<td><strong>Critical Value 5%</strong></td>
<td></td>
<td>19.01</td>
<td>19.01</td>
<td>19.01</td>
<td>19.01</td>
<td>19.01</td>
</tr>
<tr>
<td><strong>Critical Value 1%</strong></td>
<td></td>
<td>20.25</td>
<td>20.25</td>
<td>20.25</td>
<td>20.25</td>
<td>20.25</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>N&gt;100</td>
<td>N&gt;100</td>
<td>N&gt;100</td>
<td>N&gt;100</td>
<td>N&gt;100</td>
<td>N&gt;100</td>
</tr>
</tbody>
</table>
Table 4.1 The impact of Domini affiliation on performance indicators

<table>
<thead>
<tr>
<th>Var/Dep.</th>
<th>Tot Sales</th>
<th>ROI</th>
<th>ROE</th>
<th>ROCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domini</td>
<td>0.129</td>
<td>-0.096</td>
<td>-0.064</td>
<td>-0.096</td>
</tr>
<tr>
<td></td>
<td>(4.98)</td>
<td>(-2.46)</td>
<td>(-1.50)</td>
<td>(-2.63)</td>
</tr>
<tr>
<td>Entry</td>
<td>0.017</td>
<td>0.039</td>
<td>0.047</td>
<td>0.074</td>
</tr>
<tr>
<td></td>
<td>(0.41)</td>
<td>(0.65)</td>
<td>(0.69)</td>
<td>(1.26)</td>
</tr>
<tr>
<td>log(Postexit)</td>
<td>-0.231</td>
<td>-0.211</td>
<td>-0.233</td>
<td>-0.234</td>
</tr>
<tr>
<td></td>
<td>(-4.53)</td>
<td>(-2.59)</td>
<td>(-2.83)</td>
<td>(-3.26)</td>
</tr>
<tr>
<td>Military</td>
<td>0.453</td>
<td>-0.026</td>
<td>-0.064</td>
<td>0.128</td>
</tr>
<tr>
<td></td>
<td>(2.67)</td>
<td>(-0.11)</td>
<td>(-0.21)</td>
<td>(0.55)</td>
</tr>
<tr>
<td>Environment</td>
<td>0.123</td>
<td>0.140</td>
<td>0.242</td>
<td>0.245</td>
</tr>
<tr>
<td></td>
<td>(0.88)</td>
<td>(0.69)</td>
<td>(1.10)</td>
<td>(1.27)</td>
</tr>
<tr>
<td>Product quality</td>
<td>0.246</td>
<td>-0.046</td>
<td>-0.306</td>
<td>-0.242</td>
</tr>
<tr>
<td></td>
<td>(1.85)</td>
<td>(-0.23)</td>
<td>(-1.46)</td>
<td>(-1.37)</td>
</tr>
<tr>
<td>Badgov.ce</td>
<td>-0.036</td>
<td>0.134</td>
<td>-0.054</td>
<td>0.119</td>
</tr>
<tr>
<td></td>
<td>(-0.26)</td>
<td>(0.69)</td>
<td>(-0.27)</td>
<td>(0.69)</td>
</tr>
<tr>
<td>Badlabour</td>
<td>0.152</td>
<td>0.332</td>
<td>0.400</td>
<td>0.407</td>
</tr>
<tr>
<td></td>
<td>(1.24)</td>
<td>(1.85)</td>
<td>(1.90)</td>
<td>(2.30)</td>
</tr>
<tr>
<td>Log(Size)</td>
<td>-0.705</td>
<td>-0.048</td>
<td>-0.074</td>
<td>-0.029</td>
</tr>
<tr>
<td></td>
<td>(-78.80)</td>
<td>(-3.67)</td>
<td>(-4.95)</td>
<td>(-2.27)</td>
</tr>
<tr>
<td>Constant</td>
<td>10.903</td>
<td>2.665</td>
<td>3.466</td>
<td>2.735</td>
</tr>
<tr>
<td></td>
<td>(140.01)</td>
<td>(7.72)</td>
<td>(26.58)</td>
<td>(25.07)</td>
</tr>
<tr>
<td>R² within</td>
<td>0.428</td>
<td>0.032</td>
<td>0.021</td>
<td>0.033</td>
</tr>
<tr>
<td>R² between</td>
<td>0.402</td>
<td>0.001</td>
<td>0.001</td>
<td>0.000</td>
</tr>
<tr>
<td>R² overall</td>
<td>0.393</td>
<td>0.007</td>
<td>0.002</td>
<td>0.010</td>
</tr>
<tr>
<td>Joint insignificance of the fixed effects †</td>
<td>95.13</td>
<td>6.70</td>
<td>5.21</td>
<td>6.90</td>
</tr>
<tr>
<td>P-value</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Number of obs.</td>
<td>11986</td>
<td>9792</td>
<td>10357</td>
<td>10472</td>
</tr>
</tbody>
</table>

Average fixed effects

<table>
<thead>
<tr>
<th></th>
<th>Domini sample</th>
<th>Non domini sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domini sample</td>
<td>0.070*</td>
<td>-0.184*</td>
</tr>
<tr>
<td>Non domini sample</td>
<td>-0.084*</td>
<td>-0.019</td>
</tr>
</tbody>
</table>

Average fixed effects net of industry and size

<table>
<thead>
<tr>
<th></th>
<th>Domini sample</th>
<th>Non domini sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domini sample</td>
<td>0.034*</td>
<td>-0.089*</td>
</tr>
<tr>
<td>Non domini sample</td>
<td>0.025*</td>
<td>-0.070*</td>
</tr>
</tbody>
</table>

Legend of the dependent variables: Totalsales: total sales per worker; R&D: Research and Development per worker; ROI return on investment; ROE Return on Equity, ROCE: Return on Capital Employed.

Legend of the regressors: Domini: dummy for affiliation in the Domini 400 index; Entry: dummy for entry into the Domini 400 index; Postexit: number of years after exit from the Domini 400 index; Military, Environment, Productquality, Badgov.nce and Badlabour: dummies taking value of one the year of exit when the exit rationale (Military, Environment, Productquality, Badgov.nce and Badlabour) applies, Size. Number of firm employees. Coefficients and t-stats of year dummies are omitted for reasons of space and available upon request.

* Subgroup means are significantly different at 95 percent.
† F-test. Null hypothesis that all u_i=0.
Table 4.2 The impact of Domini affiliation on performance indicators (large capitalisation firms excluded from the sample)

<table>
<thead>
<tr>
<th>Var\Dep.</th>
<th>Tot Sales</th>
<th>ROI</th>
<th>ROE</th>
<th>ROCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domini</td>
<td>0.050</td>
<td>-0.172</td>
<td>-0.156</td>
<td>-0.119</td>
</tr>
<tr>
<td></td>
<td>(1.45)</td>
<td>(-3.33)</td>
<td>(-2.83)</td>
<td>(-2.53)</td>
</tr>
<tr>
<td>Entry</td>
<td>0.061</td>
<td>0.170</td>
<td>0.081</td>
<td>0.137</td>
</tr>
<tr>
<td></td>
<td>(1.11)</td>
<td>(2.15 )</td>
<td>(0.95 )</td>
<td>(1.86)</td>
</tr>
<tr>
<td>log(Postexit)</td>
<td>-0.147</td>
<td>-0.596</td>
<td>-0.164</td>
<td>-0.617</td>
</tr>
<tr>
<td></td>
<td>(-1.58)</td>
<td>(-3.46)</td>
<td>(-1.17)</td>
<td>(-4.38)</td>
</tr>
<tr>
<td>Military</td>
<td>0.628</td>
<td>-0.227</td>
<td>-0.391</td>
<td>-0.212</td>
</tr>
<tr>
<td></td>
<td>(2.84)</td>
<td>(-0.77)</td>
<td>(-1.18)</td>
<td>(-0.73)</td>
</tr>
<tr>
<td>Environment</td>
<td>0.009</td>
<td>0.205</td>
<td>0.181</td>
<td>0.426</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.88 )</td>
<td>(0.75 )</td>
<td>(2.00)</td>
</tr>
<tr>
<td>Product quality</td>
<td>0.185</td>
<td>-0.052</td>
<td>-0.592</td>
<td>-0.315</td>
</tr>
<tr>
<td></td>
<td>(0.98)</td>
<td>(-0.17)</td>
<td>(-2.10)</td>
<td>(-1.28)</td>
</tr>
<tr>
<td>Badgov.ce</td>
<td>-0.121</td>
<td>0.070</td>
<td>-0.125</td>
<td>0.109</td>
</tr>
<tr>
<td></td>
<td>(-0.83)</td>
<td>(0.34 )</td>
<td>(-0.59)</td>
<td>(0.60)</td>
</tr>
<tr>
<td>Badlabour</td>
<td>-0.367</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td>(-0.67)</td>
<td>.</td>
<td>(-0.44)</td>
<td>.</td>
</tr>
<tr>
<td>Log(Size)</td>
<td>-0.734</td>
<td>-0.056</td>
<td>-0.080</td>
<td>-0.034</td>
</tr>
<tr>
<td></td>
<td>(-66.90)</td>
<td>(-3.58)</td>
<td>(-4.42)</td>
<td>(-2.27)</td>
</tr>
<tr>
<td>Constant</td>
<td>10.743</td>
<td>2.910</td>
<td>3.530</td>
<td>2.739</td>
</tr>
<tr>
<td></td>
<td>(113.26)</td>
<td>(21.67)</td>
<td>(22.79)</td>
<td>(21.07)</td>
</tr>
<tr>
<td>R² within</td>
<td>0.435</td>
<td>0.035</td>
<td>0.024</td>
<td>0.036</td>
</tr>
<tr>
<td>R² between</td>
<td>0.483</td>
<td>0.000</td>
<td>0.000</td>
<td>0.002</td>
</tr>
<tr>
<td>R² overall</td>
<td>0.478</td>
<td>0.007</td>
<td>0.004</td>
<td>0.011</td>
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<tr>
<td>Joint insignificance of the fixed effects †</td>
<td>60.10</td>
<td>6.31</td>
<td>4.82</td>
<td>6.56</td>
</tr>
<tr>
<td>P-value</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Number of obs.</td>
<td>8361</td>
<td>6862</td>
<td>7345</td>
<td>7334</td>
</tr>
</tbody>
</table>

Average fixed effects

Domini sample 0.044* 0.043* 0.019* 0.038*
Non domini sample -0.105* -0.109* -0.045* -0.092*

Average fixed effects net of industry and size

Domini sample -0.024* 0.032* 0.016* 0.026*
Non domini sample 0.057* -0.079* -0.039* -0.063*

Legend of the dependent variables: Totsales: total sales per worker; R&D: Research and Development per worker; Roi: return on investment; Roe: Return on Equity, Roce: Return on Capital Employed.

Legend of the regressors: Domini: dummy for affiliation in the Domini 400 index; Entry: dummy for entry into the Domini 400 index; Postexit: number of years after exit from the Domini 400 index; Military, Environment, Productquality, Badgov.ce and Badlabour: dummies taking value of one the year of exit when the exit rationale (Military, Environment, Productquality, Badgov.ce and Badlabour) applies, Size. Number of firm employees. Coefficients and t-stats of year dummies are omitted for reasons of space and available upon request.

* Subgroup means are significantly different at 95 percent.
† F-test. Null hypothesis that all u_i=0.
Table 4.3 The impact of Domini affiliation on performance indicators (non R&D investing firms)

<table>
<thead>
<tr>
<th>Var/Dep.</th>
<th>Tot Sales</th>
<th>ROI</th>
<th>ROE</th>
<th>ROCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domini</td>
<td>0.158</td>
<td>-0.150</td>
<td>-0.085</td>
<td>-0.148</td>
</tr>
<tr>
<td></td>
<td>(5.11)</td>
<td>(-3.05)</td>
<td>(-1.63)</td>
<td>(-3.34)</td>
</tr>
<tr>
<td>Entry</td>
<td>-0.015</td>
<td>0.048</td>
<td>0.053</td>
<td>0.164</td>
</tr>
<tr>
<td></td>
<td>(-0.31)</td>
<td>(0.64 )</td>
<td>(0.64)</td>
<td>(2.35)</td>
</tr>
<tr>
<td>log(Postexit)</td>
<td>-0.017</td>
<td>-0.331</td>
<td>0.0001</td>
<td>-0.219</td>
</tr>
<tr>
<td></td>
<td>(-0.20)</td>
<td>(-1.92)</td>
<td>(1.21 )</td>
<td>(-1.91 )</td>
</tr>
<tr>
<td>Military</td>
<td>0.542</td>
<td>0.298</td>
<td>-0.196</td>
<td>0.043</td>
</tr>
<tr>
<td></td>
<td>(2.42)</td>
<td>(0.77)</td>
<td>(-0.47)</td>
<td>(0.13)</td>
</tr>
<tr>
<td>Environment</td>
<td>-0.362</td>
<td>-0.023</td>
<td>0.362</td>
<td>-0.065</td>
</tr>
<tr>
<td></td>
<td>(-1.53)</td>
<td>(-0.06)</td>
<td>(0.97)</td>
<td>(-0.20)</td>
</tr>
<tr>
<td>Product quality</td>
<td>-0.168</td>
<td>0.055</td>
<td>-0.372</td>
<td>-0.354</td>
</tr>
<tr>
<td></td>
<td>(-0.99)</td>
<td>(0.21 )</td>
<td>(-1.43)</td>
<td>(-1.57 )</td>
</tr>
<tr>
<td>Badgov.ce</td>
<td>0.112</td>
<td>0.180</td>
<td>-0.020</td>
<td>0.138</td>
</tr>
<tr>
<td></td>
<td>(0.73)</td>
<td>(0.79)</td>
<td>(-0.09)</td>
<td>(0.69)</td>
</tr>
<tr>
<td>Badlabour</td>
<td>0.263</td>
<td>0.623</td>
<td>0.451</td>
<td>0.547</td>
</tr>
<tr>
<td></td>
<td>(1.39)</td>
<td>(2.05 )</td>
<td>(1.54)</td>
<td>(1.92)</td>
</tr>
<tr>
<td>Log(Size)</td>
<td>-0.789</td>
<td>-0.028</td>
<td>-0.067</td>
<td>-0.014</td>
</tr>
<tr>
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<td>(-7.020)</td>
<td>(-1.64)</td>
<td>(-3.61)</td>
<td>(-0.89)</td>
</tr>
<tr>
<td>Constant</td>
<td>11.517</td>
<td>2.723</td>
<td>3.391</td>
<td>2.675</td>
</tr>
<tr>
<td></td>
<td>(118.66)</td>
<td>(18.61)</td>
<td>(21.19)</td>
<td>(19.43)</td>
</tr>
<tr>
<td>R² within</td>
<td>0.462</td>
<td>0.032</td>
<td>0.020</td>
<td>0.035</td>
</tr>
<tr>
<td>R² between</td>
<td>0.408</td>
<td>0.003</td>
<td>0.000</td>
<td>0.001</td>
</tr>
<tr>
<td>R² overall</td>
<td>0.426</td>
<td>0.011</td>
<td>0.002</td>
<td>0.012</td>
</tr>
<tr>
<td>Joint insignificance of the fixed effects †</td>
<td>69.11</td>
<td>6.13</td>
<td>3.96</td>
<td>5.37</td>
</tr>
<tr>
<td>P-value</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Number of obs.</td>
<td>8287</td>
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<td>7307</td>
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</table>

Average fixed effects

<table>
<thead>
<tr>
<th></th>
<th>Domini sample</th>
<th>Non domini sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domini sample</td>
<td>0.055*</td>
<td>-0.138*</td>
</tr>
<tr>
<td></td>
<td>0.045*</td>
<td>-0.119*</td>
</tr>
<tr>
<td></td>
<td>0.010</td>
<td>-0.025</td>
</tr>
<tr>
<td></td>
<td>0.045*</td>
<td>-0.113*</td>
</tr>
</tbody>
</table>

Average fixed effects net of industry and size

<table>
<thead>
<tr>
<th></th>
<th>Domini sample</th>
<th>Non domini sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domini sample</td>
<td>0.014</td>
<td>-0.036</td>
</tr>
<tr>
<td></td>
<td>0.043*</td>
<td>-0.114*</td>
</tr>
<tr>
<td></td>
<td>0.012*</td>
<td>-0.031*</td>
</tr>
<tr>
<td></td>
<td>0.041*</td>
<td>-0.104*</td>
</tr>
</tbody>
</table>

Legend of the dependent variables: Tot sales: total sales per worker; R&D: Research and Development per worker; ROI: Return on investment; ROE: Return on Equity, ROCE: Return on Capital Employed.
Legend of the regressors: Domini: dummy for affiliation in the Domini 400 index; Entry: dummy for entry into the Domini 400 index; Postexit: number of years after exit from the Domini 400 index; Military, Environment, Product quality, Bad gov. ce and Badlabour: dummies taking value of one the year of exit when the exit rationale (Military, Environment, Product quality, Bad gov. ce and Badlabour) applies, Size. Number of firm employees.
Coefficients and t-stats of year dummies are omitted for reasons of space and available upon request.
* Subgroup means are significantly different at 95 percent.
† F-test. Null hypothesis that all u_i=0.
Table 4.4 The impact of Domini affiliation on performance indicators (non R&D investing firms -large capitalisation firms are excluded from the sample)

<table>
<thead>
<tr>
<th>Var\Dep.</th>
<th>Tot Sales</th>
<th>ROI</th>
<th>ROE</th>
<th>ROCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domini</td>
<td>0.090</td>
<td>-0.202</td>
<td>-0.177</td>
<td>-0.146</td>
</tr>
<tr>
<td>Entry</td>
<td>0.020</td>
<td>-0.076</td>
<td>0.008</td>
<td>0.182</td>
</tr>
<tr>
<td>log(Postexit)</td>
<td>0.035</td>
<td>-0.175</td>
<td>0.163</td>
<td>-0.532</td>
</tr>
<tr>
<td>Military</td>
<td>0.689</td>
<td>-0.045</td>
<td>0.059</td>
<td>-0.166</td>
</tr>
<tr>
<td>Environment</td>
<td>-0.548</td>
<td>-0.124</td>
<td>0.208</td>
<td>0.059</td>
</tr>
<tr>
<td>Product quality</td>
<td>-0.351</td>
<td>-0.047</td>
<td>-0.554</td>
<td>-0.445</td>
</tr>
<tr>
<td>Badgov.ce</td>
<td>0.051</td>
<td>0.115</td>
<td>-0.111</td>
<td>0.161</td>
</tr>
<tr>
<td>Log(Size)</td>
<td>-0.786</td>
<td>-0.057</td>
<td>-0.067</td>
<td>-0.030</td>
</tr>
<tr>
<td>Constant</td>
<td>11.090</td>
<td>2.966</td>
<td>3.212</td>
<td>2.600</td>
</tr>
</tbody>
</table>

| R² within | 0.455 | 0.037 | 0.023 | 0.040 |
| R² between | 0.500 | 0.005 | 0.001 | 0.003 |
| R² overall | 0.505 | 0.011 | 0.006 | 0.015 |
| Joint insignificance of the fixed effects † | 45.92 | 5.93 | 3.84 | 5.29 |
| P-value | (0.000) | (0.000) | (0.000) | (0.000) |
| Number of obs. | 5975 | 4792 | 5308 | 5312 |

Average fixed effects

| Domini sample | 0.029 | 0.054* | 0.022* | 0.050* |
| Non domini sample | -0.068 | -0.129* | -0.051* | -0.115* |

Average fixed effects net of industry and size

| Domini sample | -0.039* | 0.044* | 0.020* | 0.039* |
| Non domini sample | 0.090* | -0.107* | -0.045* | -0.090* |

Legend of the dependent variables: Totsales: total sales per worker; R&D: Research and Development per worker; ROi return on investment; ROe Return on Equity, ROce: Return on Capital Employed.

Legend of the regressors: Domini: dummy for affiliation in the Domini 400 index; Entry: dummy for entry into the Domini 400 index; Postexit: number of years after exit from the Domini 400 index; Military, Environment, Productquality, Badgov.ce and Badlabour: dummies taking value of one the year of exit when the exit rationale (Military, Environment, Productquality, Badgov.ce and Badlabour) applies, Size. Number of firm employees. Coefficients and t-stats of year dummies are omitted for reasons of space and available upon request.

* Subgroup means are significantly different at 95 percent.

† F-test. Null hypothesis that all u_j=0.
Table 5. GARCH (1,1) estimated conditional volatility for SR firms and the control sample

### MEAN RETURN EQUATION

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>DOMINI INDEX CONSTITUENTS</th>
<th>VARIABLES</th>
<th>CONTROL GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rt-1</td>
<td>0.1283**</td>
<td>Rt-1</td>
<td>0.1250**</td>
</tr>
<tr>
<td></td>
<td>[7.4931]</td>
<td></td>
<td>[7.0795]</td>
</tr>
<tr>
<td>DJUN</td>
<td>-7.75E-05</td>
<td>DJUN</td>
<td>-0.0002</td>
</tr>
<tr>
<td></td>
<td>[-0.4258]</td>
<td></td>
<td>[-0.8587]</td>
</tr>
<tr>
<td>DMONDAY</td>
<td>-0.0002</td>
<td>DMONDAY</td>
<td>-0.0004**</td>
</tr>
<tr>
<td></td>
<td>[-1.2607]</td>
<td></td>
<td>[-2.3157]</td>
</tr>
<tr>
<td>DTHURSDAY</td>
<td>-0.0002</td>
<td>DTHURSDAY</td>
<td>-0.0003*</td>
</tr>
<tr>
<td></td>
<td>[-1.3785]</td>
<td></td>
<td>[-1.6532]</td>
</tr>
<tr>
<td>DWEDNESDAY</td>
<td>7.80E-05</td>
<td>DWEDNESDAY</td>
<td>0.0002</td>
</tr>
<tr>
<td></td>
<td>[0.4824]</td>
<td></td>
<td>[1.0250]</td>
</tr>
<tr>
<td>DFRIDAY</td>
<td>-4.60E-05</td>
<td>DFRIDAY</td>
<td>-4.35E-05</td>
</tr>
<tr>
<td></td>
<td>[0.3026]</td>
<td></td>
<td>[-0.2566]</td>
</tr>
<tr>
<td>constant</td>
<td>0.0003**</td>
<td>constant</td>
<td>0.0004**</td>
</tr>
<tr>
<td></td>
<td>[2.9580]</td>
<td></td>
<td>[3.4081]</td>
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</table>

### VARIANCE EQUATION

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<tr>
<th>VARIABLES</th>
<th>DOMINI INDEX CONSTITUENTS</th>
<th>VARIABLES</th>
<th>CONTROL GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\varepsilon_{t-1}^2$ -SR</td>
<td>0.0883**</td>
<td>$\varepsilon_{t-1}^2$ -CA</td>
<td>0.0864**</td>
</tr>
<tr>
<td></td>
<td>[5.9167]</td>
<td></td>
<td>[13.699]</td>
</tr>
<tr>
<td>$h_{t-1}$ -SR</td>
<td>0.9026**</td>
<td>$h_{t-1}$ -CA</td>
<td>0.8979**</td>
</tr>
<tr>
<td></td>
<td>[147.909]</td>
<td></td>
<td>[126.947]</td>
</tr>
<tr>
<td>Constant-SR</td>
<td>1.84E-07**</td>
<td>Constant-CA</td>
<td>2.97E-07**</td>
</tr>
<tr>
<td></td>
<td>[5.9168]</td>
<td></td>
<td>[7.2819]</td>
</tr>
</tbody>
</table>

Legend of the variables: $h_t$: conditional variance estimated in the GARCH (1,1) model; $\varepsilon_{t-1}^2$: lagged square residual of the mean equation. T-stats are in square brackets. ** 95 percent significance, * 90 percent significance.
Figure 1 Conditional variance (SR firms vs control sample)

Legend: ht_sr_trend2: conditional variance of Domini constituents index stock returns; ht_ca_trend2: conditional variance of control group index stock returns.
Table 6 The impact of the speculative bubble burst on stock volatility in a GARCH model (the event date is March 10, 2000)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Domini index</th>
<th>Control sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_{t-1} )</td>
<td>0.1315**</td>
<td>0.1281**</td>
</tr>
<tr>
<td></td>
<td>[7.3757]</td>
<td>[7.0439]</td>
</tr>
<tr>
<td>DJanuary</td>
<td>-5.89E-05</td>
<td>-0.0001</td>
</tr>
<tr>
<td></td>
<td>[-0.3212]</td>
<td>[-0.7688]</td>
</tr>
<tr>
<td>DMonday</td>
<td>0.0001</td>
<td>-0.0003**</td>
</tr>
<tr>
<td></td>
<td>[-1.1273]</td>
<td>[-2.1652]</td>
</tr>
<tr>
<td>DThursday</td>
<td>-0.0001</td>
<td>-0.0002*</td>
</tr>
<tr>
<td></td>
<td>[-1.3059]</td>
<td>[-1.6288]</td>
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<tr>
<td>DWednesday</td>
<td>9.50E-05</td>
<td>0.0002</td>
</tr>
<tr>
<td></td>
<td>[0.5886]</td>
<td>[1.1074]</td>
</tr>
<tr>
<td>DFriday</td>
<td>-3.67E-05</td>
<td>-3.41E-05</td>
</tr>
<tr>
<td></td>
<td>[-0.2425]</td>
<td>[-0.2019]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0003**</td>
<td>0.0004**</td>
</tr>
<tr>
<td></td>
<td>[2.7696]</td>
<td>[3.2301]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Domini index</th>
<th>Control sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \varepsilon^2_{t-1} )</td>
<td>0.0914**</td>
<td>0.0926**</td>
</tr>
<tr>
<td></td>
<td>[14.0605]</td>
<td>[12.7800]</td>
</tr>
<tr>
<td>( h_{t-1} )</td>
<td>0.8870**</td>
<td>0.8678**</td>
</tr>
<tr>
<td></td>
<td>[106.9555]</td>
<td>[75.5598]</td>
</tr>
<tr>
<td>DBUBBLE</td>
<td>4.16E-07**</td>
<td>8.31E-07**</td>
</tr>
<tr>
<td></td>
<td>[4.9226]</td>
<td>[5.0562]</td>
</tr>
<tr>
<td>Constant</td>
<td>2.55E-07**</td>
<td>4.90E-07**</td>
</tr>
<tr>
<td></td>
<td>[6.0761]</td>
<td>[6.9037]</td>
</tr>
<tr>
<td>Wald ( \chi^2 )</td>
<td>9342.3</td>
<td>9432.21</td>
</tr>
</tbody>
</table>

F-test on the significance in the difference of DBUBBLE coefficient in the SR and non SR sample (p-value) (.01) (.01)

| Obs                   | 3651         | 3651           |

Legend of the variables: \( h_t \): conditional variance estimated in the GARCH (1,1) model; \( \varepsilon^2_{t-1} \): lagged square residual of the mean equation. DBUBBLE: dummy which takes the value of 1 after the March 10 2000 and zero otherwise. T-stats are in square brackets. ** 95 percent significance, * 90 percent significance.
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 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 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 investment 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.
Maintenance of the Domini 400 Socialsm Index (DS 400 Index)

Through its DS 400 Index Committee (the Committee), KLD maintains the Index at 400 companies at all times. The Committee makes all decisions about additions and removals for the DS 400, adding a company to the index at the same time that another company is removed. The Committee also creates, reviews, and maintains the Working Guidelines, publishes additional background materials, and responds to public inquiries about the maintenance of the DS 400. The Committee meets at least once a month, but may meet more frequently as needed.

Companies may be removed from the DS 400 Index at any time for one of four reasons: Corporate Actions; Failure of Exclusionary Screens; Failure of Qualitative Screens; or Lack of Social and Financial Representation. In cases of corporate actions or failure of an exclusionary screen, a company is removed at the time the action occurs or when the company is added to one of KLD’s exclusionary reports. In cases of qualitative screen failure or lack of social and financial representation, the removal generally occurs immediately after the monthly Committee meeting when the decision to remove the company is made.

The Committee maintains a ranked list of companies for addition to the DS 400 Index. The Committee seeks out companies for addition to the Index that fall into at least one of the following three categories: companies with particularly strong social stories; companies that enable the DS 400 Index to approximate the industry diversification and market capitalization of the S&P 500; and/or companies that allow the Committee to maintain the DS 400 Index with approximately 250 S&P companies, 100 Non-S&P companies for sector diversification and market capitalization, and 50 Non-S&P companies with exceptional social stories.

Exclusionary screens include Military-Weapons, Alcohol, Tobacco, Firearms, Nuclear Power, and Gambling.
List of firms which are always in the Domini index in the estimation period

ADVMICRO DEVC, AIR PRDS& CHEMS, ALBERTO CULVER 'B', ALBERTSONS, AMERICAN EXPRESS, AMERICAN INTLGP, AMR (AMERICAN AIRLINES), ANADARKO PETROLEUM, ANALOG DEVICES, ANGELICA, APACHE, APPLE COMPUTER S, APPLIED MATS, AUTODESK, AUTOMATIC DATA PROC, AVERY DENNISON, AVON PRODUCTS, BALDOR ELECTRIC, BANK OF AMERICA, BANK ONE, BASSETT FRTR, BECTON DICKINSON &CO, BELL SOUTH, BEMIS, BIOMET, BOB EVANS FARMS, CABOT, CALGON, CARBON, CAMPBELL SOUP, CENTEX, CHUBB, CHURCH & DWIGHT, CIGNA, CINCINNATI FIN, CINTAS, CIRCUIT, CITY STORES, CITIZENS COMMS, CLAIRES STORES, CLARCOR, CLOROX, COCA COLA, COCA COLA ENTS, COMCAST 'A', COMCAST SPECIAL 'A', CONSOL EN, COOPER INDS, CPI, CROSS A T, CUMMINS, CVS, CYPRESS SEMICON, DANA, DELUXE, DIONEX, DOLLAR GENERAL, DONNELLEY R R, DOW JONES &CO, EDWARDS AG, ENERGEN, EQUITABLE RESOURCES, FASTENAL, FLEETWOOD ENTS, FOOT LOCKER, FOREST LABS, FULLER 'H' 'B', GAP, GATX, GENMILLS, GENERIC PARTS, GERBER SCIEN, GOLDEN W NK FINL, GRACO GRAINGER W W, HARLAND JOHN, H HARMAN INTLINDS, HARTMARX, HEALTH CARE REIT, HEINZ HJ, HELMERIC PAYNE, HERSHEY FOODS, HILLENBRAND, HNI, HOME DEPOT, HUBBELL 'B', HUMANA, IDA CORPINCHDG, IKON OFFICE SLTN, ILLINOIS TOOL WKS, INTEL, IONICS, ISCO, JEFFERSON PILOT, JP MORGAN CHASE &CO, KB HOME, KELLY SERVICES 'A', KEYSSPAN, KROGER, LAWSOM PRODUCTS, LEEENTERPRISES, LEGGETT&PLATT, LIMITED BRANDS, LINCOLN ELECTRIC HDG, LINCOLN NAT, LIZ CLAIBORNE, LONGS DRUG STRS, LOWE'S COMPANIES, LUBY, MANOR CARE, MARSH & MCLENNAN, MATTEL, MAY DEPTSTORES, MAYTAG, MCDONALDS, MCGRAW HILL CO, MCKESSON, MEDWESTVAO, MEDIA GENERAL, MEDITRONIC, MELLON FINL, MERCK &CO, MEREDITH, MERRILL LYNCH &CO, MICRON TECH, MILACRON, MILLER (HERMAN), MILLIPORE, MODINE, MNFG, MLN LABORATORIES, NCR, NEW ENGLBUSSER, NEW YORK TIMES 'A', NEWELL RUBBERMAID, NORDSON, NORDSTROM, NORFOLK SOUTHERN, NUCOR, OMNICOM GP, OSHKOSH, TRUCK 'B', PENNEY JC, PEP BOYS MANNY, PEPSIAMERICA, PEPSICO, PHILLIPS V HEUSN, PITNEY BOWES, PNC FINLSVS GSP, PROCOR & GAMBLE, PROVIDIAN FINL, RADIOSHACK, RIEEBOK INTL, ROUSE, ROWAN COS, RYDER SYSTEM, SAFECO, SCOTT'S 'A', SEALED AIR, SEARS ROEBUCK &CO, SIGMA ALDRICH, SKIN FINLGP, SMITH INTL, SMUCKER JM, SNAP ON SOUTHERN, SOUTHWEST AIRLINES, SPRINT FON, SPX STANLEY WORKS, STDRREGISTER, STJUDE MED, STPAUL, TRAVELLERS, STRIDE RITE, STRYKER, STUDENT LN, SUN MICROSYSTEMS, SUNOCO, SUNTRUST BANKS, SUPERVALU, SYSCO, TARGET, TEKTRONIX, TELEPHONE & DATA SYS, TELLABS, TENNANT, THERMO ELECTRON, THOMAS INDS, TJX COS, TOOTSIE ROLL, TOTOY R, US HOLDINGS CO, UNUMPROVIDENT, V F, VALUE LINE, VERIZON COMMS, WALGREEN, WAL DISNEY, WASHINGTON PST'B, WELLMAN, WELLS FARGO &CO, WENDY'S INTL, WESCO FINANCIAL, WGL HDG, WHIRLPOOL, WILLIAMS COS, WRIGLEY, WILLIAM JR, XEROX, YELLOW ROADWAY.

List of firms which are always in the Domini index in the estimation period by industry

Utilities: ENERGEN, EQUITABLE RESOURCES, IDACORP INCHDG, KEYSPAN, PEP BOYS MANNY, SOUTHERN, WGL HDG. Basic Materials: AIR PRDS& CHEMS, AVERY DENNISON, BEMIS, CABOT, CALGON CARBON, FULLER 'H' 'B', MEADWESTVAO, NUCOR, SIGMA ALDRICH, WELLMAN. Consumer Cyclical: AMR (AMERICAN AIRLINES), BOB EVANS FARMS, CENTEX, CIRCUIT CITY STORES, CLAIRES STORES, COMCAST 'A', COMCAST SPECIAL 'A', CVS, DANA, DOLLAR GENERAL, DONNELLEY R R, DOW JONES &CO, FASTENAL, FLEETWOOD ENTS, FOOT LOCKER, GAP, GENMILLS, HMGILLS, HNI, HOME DEPOT, KB HOME, LEEENTERPRISES, LEGGETT&PLATT, LIMITED BRANDS, LIZ CLAIBORNE, LONGS DRUG STRS, LOWE'S COMPANIES, LUBY, MANOR CARE, MARSH & MCLENNAN, MATTEL, MAY DEPTSTORES, MAYTAG, MCDONALDS, MCGRAW HILL CO, MCKESSON, MEDIA GENERAL, MEDITRONIC, MELLON FINL, MERCK &CO, MEREDITH, MERRILL LYNCH &CO, MICRON TECH, MILACRON, MILLER (HERMAN), MILLIPORE, MODINE, MNFG, MLN LABORATORIES, NCR, NEW ENGLBUSSER, NEW YORK TIMES 'A', NEWELL RUBBERMAID, NORDSON, NORDSTROM, NORFOLK SOUTHERN, NUCOR, OMNICOM GP, OSHKOSH, TRUCK 'B', PENNEY JC, PEP BOYS MANNY, PEPSIAMERICA, PEPSICO, PHILLIPS V HEUSN, PITNEY BOWES, PNC FINLSVS GSP, PROCOR & GAMBLE, PROVIDIAN FINL, RADIOSHACK, RIEEBOK INTL, ROUSE, ROWAN COS, RYDER SYSTEM, SAFECO, SCOTT'S 'A', SEALED AIR, SEARS ROEBUCK &CO, SIGMA ALDRICH, SKIN FINLGP, SMITH INTL, SMUCKER JM, SNAP ON SOUTHERN, SOUTHWEST AIRLINES, SPRINT FON, SPX STANLEY WORKS, STDRREGISTER, STJUDE MED, STPAUL, TRAVELLERS, STRIDE RITE, STRYKER, STUDENT LN, SUN MICROSYSTEMS, SUNOCO, SUNTRUST BANKS, SUPERVALU, SYSCO, TARGET, TEKTRONIX, TELEPHONE & DATA SYS, TELLABS, TENNANT, THERMO ELECTRON, THOMAS INDS, TJX COS, TOOTSIE ROLL, TOTOY R, US HOLDINGS CO, UNUMPROVIDENT, V F, VALUE LINE, VERIZON COMMS, WALGREEN, WAL DISNEY, WASHINGTON PST'B, WELLMAN, WELLS FARGO &CO, WENDY'S INTL, WESCO FINANCIAL, WGL HDG, WHIRLPOOL, WILLIAMS COS, WRIGLEY, WILLIAM JR, XEROX, YELLOW ROADWAY.
SOUTHWEST AIRLINES, STPAUL TRAVELLERS, SUNTRUST BANKS, UNUMPROVIDENT, VALUE LINE, WELLS FARGO &CO, WESCO FINANCIAL. **Industrial:** ANGELICA, AUTOMATIC DATA PROC, BALDOR ELECTRIC, CINTAS, CLARCOR, COOPER INDS, CPI, CUMMINS, DELUXE, DIONEX, GATX, GRACO, GRAINGER W W, HARLAND JOHN H, HUBBELL 'B', ILLINOIS TOOL WKS, IONICS, ISCO, KELLY SERVICES 'A', LINCOLN ELECTRIC HDG, MILACRON, MILLIPORE, NORDSON, NORFOLK SOUTHERN, OSHKOSH TRUCK 'B', RYDER SYSTEM, SEALED AIR, SPX, STDREGISTER, TEKTRONIX, TENNANT, THERMO ELECTRON, THOMAS INDS, TORO, YELLOW ROADWAY. **Chemicals:** AIR PRDS& CHEMS, AVERY DENNISON, CABOT, CALGON CARBON, FULLER 'H' 'B', SIGMA ALDRICH, WELLMAN. **Energy:** ANADARKO PETROLEUM, APACHE, CONSO EN, HELMERICH PAYNE, ROWAN COS, SMITH INTL, SUNOCO, WILLIAMS COS. **Health Care:** BECTO, BIOMET, CIGNA, FOREST LABS, HILLENBRAND, HUMANA, MANOR CARE, MEDITRONIC, MERCK &CO, MELLON FIN, MERRILL LYNCH &CO, MYLANN LABORATORIES, PNC FINNSVCSP, PITNEY BOWES, PNC FINLSVSGP, PROCTER & GAMBLE, SEARS ROEBUCK &CO, SOUTHERN, SOUTHWEST AIRLINES, SPINT FON, STJUDE MED, STPAUL TRAVELLERS, STRYKER, SUN MICROSYSTEMS, SUNTRUST BANKS, SYSCO, TARGET, TJX COS, VERIZON COMMS, WALGREEN, WALT DISNEY, WELLS FARGO &CO, WESCO FINANCIAL, XEROX. **Technology:** ADVDMICRO DEVC, ANALOG DEVICES, APPLE COMPUTERS, APPLIED MATS, AUTODESK, CYPRESS SEMICON, GERBER SCIEN, IKON OFFICE SLTN, INTEL, MICO RON TECH, NCR, PITNEY BOWES, SUN MICROSYSTEMS, TELLABS, XEROX. **Telecommunications:** BELLSouth, CITIZENS COMM, SPRINT FON, TELEPHONE & DATA SY, VERIZON COMMS.

List of firms which are always in the Domini index in the estimation period by size

**Large Cap:** AIR PRDS & CHEMS, ALBERTSONS, AMERICAN EXPRESS, AMERICAN INTLGP, ANADARKO PETROLEUM, ANALOG DEVICES, APACHE, APPLIED MATS, AUTOMATIC DATA PROC, AVON PRODUCTS, BANK OF AMERICA, BECTON DICKINSON &CO, BELLSouth CAMPBELL SOUP CHUBB CLOROX COCA COLA COCA COLA ENTS COMCAST 'A', COMCAST SPECIAL 'A', CVS FOREST LABS, GAP, GENMILLS, GOLDEN WEST FINL, HOME DEPOT, HILLENBRAND, HUMANA, MANOR CARE, MEDITRONIC, MERCK &CO, MYLANN LABORATORIES, STJOUE MED, STRYKER. **Small Cap:** AMR (AMERICAN AIRLINES), BOB EVANS FARMS, CHURCH & DWHITE, CLAIRES STORES, CLARCOR, CYPRESS SEMICON, DIONEX, DONNELLEY R R, ENERGEN, EQUITABLE RESOURCES, FLEETWOOD ENTS, GATX, GERBER SCIEN, GRACO, HARMAN NAT, HARTMARX, LINCOLN ELECTRIC, HDG LUBY, NEW ENGLBUSSER, PEPSICO, MANNY. **Mid Cap:** ADVDMICRO DEVC, ALBERTO CULVER 'B', ANGELICA, APPLE COMPUTERS, AUTODESK, AVERY DENNISON, BALDOR ELECTRIC, BANK ONE, BASSETT FRTR, BEMIS, BIOMET, CABOT, CALGON CARBON, CENTEX, CIGNA, CINCIN NATI FIN, CINTAS, CIRCUIT, CITY STORES, CITIZENS, COMMS, CONSO EN, COOPER INDS, CUMMINS, DANA, DELUXE, DOLLAR GENERAL, DOW JONES &CO, FASTENAL, GOLDEN WEST, GOLDBERG, GENUINE PARTS, GRAINGER W W, HARMAN INTLINDS, HEALTH CARE REIT, HERSHEY FOODS, HILLENBRAND, HUBBELL 'B', HUMANA, JEFFERSON PILOT, KB HOME, KEYSPEC, LEGGETT&PLATT, LINCOLN NAT, LIZ CLAIBORNE, MANOR CARE, MAY DEPTSTORES, MAYTAG, MEADOWSVACO, MICO RON TECH, MYLANN LABORATORIES, NCR, NEW YORK TIMES 'A', NEWWELL RUBBERMAID, NORDSTROM, NORFOLK SOUTHERN, NUCOR, PENNEY JC, PEPISAMERICA, PEPISCO, PROVIDIAN FINL, RADIOSHACK, Rouse, ROWAN COS, SAFEPO, SEALED AIR, SIGMA ALDRICH, SMITH INTL, SPX, STANLEY WORKS, SUNOCO, SUPervalu, TEKTRONIX, TELEPHONE & DATA, SYS TELLABS, THERMO ELECTRON, TOYS R US, US HOLDINGS CO, UNUMPROVIDENT, W F, WASHINGTON PST'B', WENDYS INTL, WHIRLPOOL, WILLIAMS COS, ANGELICA, BALDOR ELECTRIC, BASSETT FRTR, CALGON, CARBON, CP, I CROSS A T, FULLER 'H' 'B', HARTMARX, LINCOLN ELECTRIC, HDG LUBY, NEW ENGLBUSSER, PEP BOYS, MANNY.

**Control sample**

ABBOTT LABS, ACCREDO HEALTH, ACE, ADOBE SYSTEMS, ADOLPH COORS 'B', ADVAUTO PARTS, AES, AGILENT TECHS, AGL RES, AKAMAI TECHS, ALLEGHANY, ALLERGAN, ALIANT ENERGY
For Peer Review
CORP, AMEREAGOUTFITTERS, AMERICREDIT, AMGEN, AMYLIN PHARMS, ANDRX GP, ARAMARK 'B', ARDEN REALTY, ASSBD Bancorp, AUTONATION, BANCORPSOUTH, BANK OF HAWAII, BANKNORTH GPNEW, BB & T, BRISTOL MYERS SQUIBB, BUNGE, CAESARS ENTM, CENTURY NATIONAL, COLGATE PALM, COMPUTER SCIS, COUNTRYWIDE FINL, COVENTRY HLTHCR, CRESCENT REAL ESTATE EQ, CROWN, CASTLE INTL, DARDEN RESTAURANTS, DELPHI AUTSYS, DENTSPLY INTL, DEVON ENERGY, DOLLAR TREE STORES, DORAL FINANCIAL, DOW CHEMICAL, EDUCATION MANAGEMENT, EDWARDS LIFE SCIENCES, EL PASO, EMULEX NEW, ENDO PHARMSHDG, ENTERCOM COMMS, ENTERGY, EQUITY OFFPROPSTST, FEDERATED INVR'S'B', FIRST MARBLEHEAD, FIRSTMERIT, FISERV, FISHER SCIENINTLNEW, FLORIDA ROCK INDS, GATEWAY, GEN PROBE, GENDYNAMICS, GENENTECH, GREAT PLAINS EN, GREENPOINT FINL, HARRIS, HARSCO, HAWAIIAN ELECINDS, HEALTH NET, HIBERNIA 'A', HORMEL FOODS, HOST MARRIOTT, HOVNANIAN EN TS'A', INAMED, INDEPENDENCE CMTYBK, INGRAM MICRO 'A', INSTINET GROUP, INTLPA, INTUIT, IRON MNT, ISTAR FINL, JEFFERIES GP, JUNIPER NETWORKS, KING PHARMS, KLA TENCOR, LAFARGE NORTH AMERICA, LEGG MASON, LEXMARK INTLGPA, LUCENT TECHNOLOGIES, MACERICH, MACK CALI RLTY, MARVEL ENT, MARVEL TECHGP, MAXTOR, MBNA, METRO GOLDwyn, MAYER, MGM, MIRAGE, MOHAWK INDS, MOLEX, MOLEX 'A', MONSENTO, MONSTER WORLDWIDE, NATIONAL OILWELL, NATIONAL SEMICON, NETWORK ASSOCIATES, NEWMONT MINING, NEXTEL COMMSA, NORTHERN WORK BANCORP, NSTARCOM NTL, OCCIDENTAL PTL, OXFORD HEALTH, PLANS, PACKCORPOF AM, PACHLTHSYS, PACTIV, PENTAIR, PINNACLE WEST CAP, PIONEER NATRES, PIKAR, PLAINS ALL AMERPIPELPE, PLUM CREEK TIMBER, POLARIS INDS, POLYCOM, POLARIS INDUSTRIES, PPL PROLOGIS, PRUDENTIAL FINL, PUBLIC STORAGE, PUBLIX SUPER MARKETS, PUSHERENTERGP, RAMPUS, RAYMOND JAMES FINL, RAYONIER, RED HAT, REGENCY CENTERS, RENAISSANCERE HDG, RETAIL CARE GP, RENT A CTR, RITE AID, ROHM & HAAS, ROPER INDSNEW, ROSS STORES, RPM INTL, RUBY TUESDAY, SAHARF HDG, SAFeway, SANMINA, SCI, SCANA, SCIENTIFIC ATLANTA, SERVICEMASTER, SIMON PRGP, SIRVA, SMITHFIELD FOODS, SONOCO PRDS, SPECTRASITE, STAPLES, STARBUCK,S, STFINL, SUNGARD DATA, SYSTEMS, SYNOVUS FINL, TROVE PRICE GP, TALBOTS TCF FINANCIAL, TECH DATA, TECO ENERGY, TELEFLEX, TEMPLE INLAND, TENET HLTHCR, TEMPEH PARTNERS L P, TERRYADNE, TEREK, TEXAS GENCO HDG, TEXAS INSTS, TEXTRON, THE DIRECTV GROUP, THORNBURG MGE, TIBCO SOFTWARE, TIDEWATER, TIFFANY & CO, TIME WARNER, TIMKEN TOLL BROS, TRANSAANTLHC HDG, TRANSOCEAN, TRI CONTINENTAL, TRIAD HOSPITALS, TRIBUNE, TRZEC PROPS, TRUSTMARK, TRW AUTVHDG, TXU, TYCO INTL, UCBH, UNION PACIFIC, UNION PLANTERS, UNIONBANCAL, UNISYS, UNITED PARCEL SER'B', UNITED TECHNOLOGIES, UNITEDGLOBALCOM 'A', UNITEDHEALTH GP, UNITIN, UNIVERSAL HEALTH, US'S'B', UNOCAL, USSTEEL, UTDOMINION REALTY TST, VENTAS, VERISIGN, VERITAS SOFTWARE, VISHAY INTERTECH, VORNADO REALTY TST, WACHOVIA, WASTE MAN, WATERS, WATSON PHARMS, WEATHERFORD INTL, XILINX XL CAP'A', YAHOO, ZIMMER HDG.

Control sample by industry

**Energy:** DEVON ENERGY, EL PASO, NATIONAL OILWELL, OCCIDENTAL PTL, TIDEWATER, TRANSOCEAN, UNOCAL, WEATHERFORD INTL. **Financial:** ACE, AMERICREDIT, ARDEN REALTY, ASSBD Bancorp, BANCORPSOUTH, BANK OF HAWAII, BANKNORTH GPNEW, BB & T, CATELLUS DEV, CENTERPOINT PR, CITY NATIONAL COUNTRYWIDE FINL, CRESCENT REAL ESTATE EQ, DORAL FINANCIAL, EQUITY OFFPROPSTST, FEDERATED INVR'S'B', FIRSTMERIT, GREENPOINTFINL, HIBERNIA 'A', HOST MARRIOTT, INDEPENDENCE CMTYBK, ISTAR FINL, JEFFERIES GP, LEGG MASON, MACERICH, MACK CALI RLTY, MBNA, NATIONALWIDE FINL, NORTH FORK BANCORP, PLUM CREEK TIMBER, POLARIS PROLOGIS, PRUDENTIAL FINL, PUBLIC STORAGE, RAYMOND JAMES FINL, RAYONIER, REGENCY CENTERS, RENAISSANCERE HDG, SIMON PRGP, STFINL, SYNOVUS FINL, TROWE PRICE GP, TCF FINANCIAL, THORNBURG MGE, TRANSANTLHC HDG, TRANSCEAN, TR CONTINENTAL, TRIAD HOSPITALS, TRIBUNE, TRZEC PROPS, TRUSTMARK, TRW AUTVHDG, TXU, TYCO INTL, UCBH, UNION PACIFIC, UNION PLANTERS, UNIONBANCAL, UNISYS, UNITED PARCEL SER'B', UNITED TECHNOLOGIES, UNITEDGLOBALCOM 'A', UNITEDHEALTH GP, UNITIN, UNIVERSAL HEALTH, US'S'B', UNOCAL, USSTEEL, UTDOMINION REALTY TST, VENTAS, VERISIGN, VERITAS SOFTWARE, VISHAY INTERTECH, VORNADO REALTY TST, WACHOVIA, WASTE MAN, WATERS, WATSON PHARMS, WEATHERFORD INTL, XILINX XL CAP'A', YAHOO, ZIMMER HDG.

Control sample by industry
TECHNOLOGIES, VISHAY INTERTECH, VULCAN MATERIALS, WASTE MAN, WATERS. Technology: ADOBE SYSTEMS, AKAMAI TECHS, COMPUTER SCI, CROWN CASTLE INTL, EMULEX NEW, GATEWAY, HARRIS, INTERSIL 'A', INTUIT, JUNIPER NETWORKS, KLA TENCOR, LEXMARK INTL/GPA, LUCENT TECHNOLOGIES, MARVELL TECHGP, MAXTOR, NATIONAL SEMICON, POLYCOM, RAMBUS, RED HAT, SCIENTIFIC ATLANTA, SPECTRASITE, SUNGARD DATA SYSTEMS, TERADYNE, TEXAS INSTS, TIBCO SOFTWARE, UNISYS, VERISIGN, VERITAS SOFTWARE, XILINX, YAHOO. Health Care: ABBOTT LAB, ACCREDO HEALTH, ALLERGAN, AMGEN, AMYLIN PHARMS, ANDRX GP, BRISTOL MYERS SQUIBB, CHIRON CORP, COVENTRY HLTHCR, DENTSPLY INTL, EDWARDS LIFESCIENCES, FISHER SCIENINTLNEW, GEN PROBE, GENENTECH, HEALTH NET, INAMED, KING PHARM, MONSENTO, OXFORD HEALTH PLANS, PACRHLTHSYS, RENAL CARE GP, TENET HLTHCR, TRIAD HOSPITALS, UNITEDHEALTH GP, UNIVERSAL HEALTH SVS'B', WATSON PHARMS, ZIMMER HDG. Telecommunications: NEXTEL COMMS, USCELLULAR. Utilities: AES, AGL RES, ALLIANT ENERGY CORP, ENTERGY, GREAT PLAINS EN, HAWAIIAN ELECINDS, NSTARCOM, PINNACLE WEST CAP, PPL, PUBSERENTERGP, SCANA, TEXAS GENCO HDG.

Control sample by size

Entries (into) an exits (from) the Domini index by year and motivation

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### Exits from the Domini index by year and motivation

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## App. 2

### Chronology of entries and exits from the Domini index

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<td>Providian Financial Corporation Spun-off from Providian Corporation</td>
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<td>Acquired by Compaq</td>
<td>QuickResponse Services, Inc. Community,Diversity,Employee, Product</td>
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<td>Thermo Electron Corporation</td>
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<td>Interface, Inc. Strong Environmental Record, CERES Signatory</td>
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<td>Guidant Corporation innovative product</td>
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<td>International Dairy Queen</td>
<td>Acquired by Berkshire Hathaway</td>
<td>Wendy's International Diversity, Employee Involvement, Environment-Recycling</td>
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<td>Bestfoods New name for CPC International after spinning off corn business</td>
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<td>LSI Logic Corporation. Employee strength</td>
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<td>Federal Express Corporation</td>
<td>Acquired Caliber System and changed name to FDX Holding</td>
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<td>CSX Corp</td>
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<td>Mallinckrodt Inc. Industry Diversification</td>
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<td>Brown Shoe Company, Inc.</td>
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<td>Wachovia Corporation</td>
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<td>9/5/2001</td>
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<td>Going Private</td>
<td>Electronic Data Systems</td>
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<tr>
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<tr>
<td>10/16/2001</td>
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<td>Lack of Social and Financial Representation</td>
<td>Hain Celestial Group, Inc.</td>
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<td>Masco Corporation</td>
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<td>Venator Group, Inc.</td>
<td>Name change</td>
<td>Foot Locker, Inc.</td>
<td>Name change</td>
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<tr>
<td>12/6/2001</td>
<td>Sanmina Corporation</td>
<td>Acquiring SCI Systems, a military weapons contractor</td>
<td>Rohm and Haas Company</td>
<td>Market Capitalization, Industry Diversification &amp; Community</td>
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<tr>
<td>12/12/2001</td>
<td>Ralston Purina Company</td>
<td>Acquired by Nestle SA</td>
<td>Harley-Davidson, Inc.</td>
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<td>1/24/2002</td>
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<td>Bank of America Corporation</td>
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<td>1/29/2002</td>
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<td>Merging with Mead Corporation</td>
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<td>Lincoln Electric Holdings, Inc.</td>
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<td>6/10/2002</td>
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<td>Diversity Strength and Sector Representation</td>
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Editorial Office, Dept of Economics, Warwick University, Coventry CV4 7AL, UK
| Date       | Company Name                                    | Concerns                                      | Acquired Company/Change Type                                      | Analysis
|------------|-----------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-----------------------------------------------
<p>| 7/22/2002  | Torchmark Corporation                          | Diversity and Product Concerns                | Safeway Inc.                                                     | Market Capitalization and Diversity Strength   |
| 8/12/2002  | Madison Gas &amp; Electric Company                 | Name change                                   | MGE Energy, Inc.                                                 | Name change                                    |
| 9/3/2002   | Consolidated Freightways Corporation           | Bankruptcy                                    | Invitrogen Corporation                                           | Sector Representation and Diversity Strengths |
| 10/1/2002  | Computer Associates                            | Corporate Governance Concerns                | eBay, Inc.                                                      | Market Capitalization, Diversity and Product Strengths |
| 10/1/2002  | Schering-Plough                                | Product Concerns                              | Bausch &amp; Lomb Incorporated                                     | Sector Representation and Diversity Strengths |
| 10/1/2002  | Donnelly Corporation                           | Acquired by Magna International, a Canadian Gambling company | Cathay Bancorp                                                  | Diversity Strengths                            |
| 11/18/2002 | Comcast Corporation                            | Liquidity and Voting Rights                  | Comcast Corporation                                             | Liquidity and Voting Rights                   |
| 12/5/2002  | UAL Corporation                                | Imminent Bankruptcy                           | Plantronics, Inc.                                               | Diversity and Employee Relations Strengths     |
| 12/13/2002 | Hunt Corporation                               | Being acquired by Berwind Co. LLC            | Pixar                                                           | Diversity, Employee Relations, and Product Strengths |
| 1/2/2003   | Stilwell Financial, Inc.                       | Name change                                   | Janus Capital Group, Inc.                                       | Name change                                    |
| 3/31/2003  | Foot Locker, Inc.                              | Ticker Change from Z to FL                    | Foot Locker                                                     | Ticker Change from Z to FL                     |
| 6/18/2003  | CDW Computer Centers, Inc.                     | Name change                                   | CDW Corporation                                                  | Name change                                    |
| 7/2/2003   | Lillian Vernon Corporation                     | Acquired by Ripplewood Holdings LLC           | Johnson Controls, Inc.                                          | Market Capitalization, Sector Representation, Beneficial Products |
| 7/15/2003  | Mirant Corporation                             | Bankruptcy                                    | Valspar Corporation                                             | Sector Representation                           |
| 7/22/2003  | Dell Computer Corporation                      | Name change                                   | Dell Inc.                                                       | Name change                                    |
| 7/24/2003  | AstroPower, Inc.                               | Delisted from Nasdaq                          | Valassis Communications, Inc.                                   | Family Benefits, Promotion, Cash Profit Sharing and Employee Benefits |</p>
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<td>Synovis Life Technologies, Inc.</td>
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<td>Name change</td>
<td>Time Warner, Inc.</td>
<td>Name change</td>
</tr>
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<td>10/29/2003</td>
<td>Palm, Inc.</td>
<td>Name change</td>
<td>palmOne, Inc.</td>
<td>Name change</td>
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<td>11/6/2003</td>
<td>Cathay Bancorp, Inc.</td>
<td>Name change</td>
<td>Cathay General Bancorp, Inc.</td>
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<tr>
<td>11/12/2003</td>
<td>Biogen, Inc.</td>
<td>In November 2003, the company was acquired</td>
<td>Biogen Idec Inc.</td>
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<td>Kadant Inc.</td>
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