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Corporate Social Responsibility, Environmental Leadership, and Financial Performance

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CORPORATE SOCIAL RESPONSIBILITY, ENVIRONMENTAL LEADERSHIP, AND FINANCIAL PERFORMANCE

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ABSTRACT. In this study we statistically assess the relationship between corporate characteristics, environmental contribution, and financial performance. To this end, we compare the financial performance of all US corporations that have composed the Dow Jones Sustainability Index (DJSI), being the most proactive companies in providing services and goods while maintaining ethical responsibility and environmental sustainability. Performance is compared to mean performance of the related industry, sector, and the market portfolio. Our analysis suggests that firms who are proactive supporting Social Responsibility and Environmental Sustainability (SRER corporations) are characterized by significantly higher profit measures than the industry and the sector, though not higher than the entire market; have lower short term liquidity than that of the industry and the related sector, and surprisingly their long term leverage is significantly higher. High SRER corporations are characterized by significantly higher managerial efficiency ratios than the respective industry and the sector. Interestingly, the per-worker ratios are significantly lower than all the benchmarks. These results illustrate the strong relation between social and environmental sustainability and the long term business plan. Results extend existing literature that has restricted attention to Corporate Social Responsibility and financial performance, but have left aside sustainability.

1. INTRODUCTION

For some years now there has been a movement to counteract the widely-held belief that a business has no obligation other than to maximize shareowners' wealth. The idea that there are other people and groups of people, in addition to shareowners, to whom a firm has obligations, has come to be widely known as the stakeholder theory. This theory, however, runs into intractable philosophical difficulties in providing credible principles for business managers in dealing with some more ethical topics, such as the impact of a corporation on the natural environment, that do not directly involve human beings within a business firm or who engage in transactions with firms. Corporate decision-making does however include an appreciation of these ethical values even though they cannot be captured in the stakeholder theory. Alongside increased awareness to the social responsibility of corporations, we observe an increasing awareness of consumers to *quality of life* rather than narrow economic benefits, which have accelerated ethical considerations in the economy and in business behaviors. Consumers increasingly consider social and environmental criteria in their buying decisions, a growing share of private and institutional investors make investment decisions based on social screening services, and governments around the world are implementing stricter environmental and social policies. All these are expected to directly and indirectly affect the behavior and performance of corporations.

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Prior studies in the field which have forecast, to some extent, the relationship between corporate social responsibility and financial performance have been based on several theoretical arguments. Those that have suggested a negative relation between social responsibility and financial performance have argued that high responsibility results in additional costs that put the firm at an economic disadvantage compared to other, less socially responsible firms (Bradgon, 1972; Vance, 1975; Aupperle and Hatfield, 1985; Ullmann, 1985). Higher costs are expended to decrease cash flow left within the firm. In contrast, other scholars investigating social responsibility and performance have argued for a positive association due to improved employee and customer goodwill as an important outcome of social responsibility, higher employee morale and productivity (Davis, 1960; Parket and Eibert, 1975; Soloman and Hansen, 1985). This approach goes along with the stakeholder theory Cornell and Shapiro (1987) contends that the value of a firm depends on the cost not only of explicit claims but also of implicit claims: if a firm does not act in a socially responsible manner, parties to implicit contracts concerning the social responsibility of the firm may attempt to transform those implicit agreements into explicit agreements that will be more costly to it. Moreover, socially irresponsible actions may spill over to other implicit stakeholders, who may doubt whether the firm would honor their claims. Thus, firms with an image of high corporate social responsibility may find that they have more low-cost implicit claims than other firms and thus have higher financial performance. An additional aspect to be mentioned is the positive reputation effect of Corporate Social Responsibility as of managerial skills. It is believed that high social responsibility levels signals stakeholders high managerial skill level. A higher CSR level results in a corporate value increase since the managers earn a reduction in explicit costs in return for a lower implicit charges to increase its reputation (Alexander and Bucholtz, 1978; Bowman and Haire, 1975). Given the counter effects that SRER may generate, we find it necessary to split the analysis into four frameworks, that each identifies the impact of SRER on determined classes of performances. The financial indicators assist us in classifying and evaluating each of the performance levels.

Former studies mostly classify financial-economic performance into (i) Market return measures; (ii) Market risk measures; (iii) Accounting based performance measures; and (iv) accounting based risk measures. McGuire and Schneeweis (1988) have conducted an analysis under a similar framework for valuating performance of corporate with social responsibility during period the 1983-1985. They have shown that pre performance measures all above specified measures are closely related to the CSR rating than the post rating performance, and that measures of risk are closely associated with CSR. McGuire and Schneeweis (1988) analysis was based on Fortune magazine annual survey of CRS rating. Our results for the year period 2008-2010 are consistent with previous result of CSR firms' performance, but strength an interesting phenomena which was not identified in previous literature: Long term considerations significantly increase the financial performance of firms, relative to the mean performance of their related industry and sector, in comparison to performance of short run overseen. This phenomenon is reasonably when taking into consideration social responsibility that is closely related environmental performance. The investment and attitude the supports environmental sustainability necessitate long run thinking and considerations.

The impact of short term consideration on the firm behavior and performance has been much studied during the 90's (including studies by ??Posnikoff (1997); Hong et al. (1999); Worrell and Sharma (1991); Wright and Ferris (1997)). The long run impact of CRS has been studied via analysis of accounting profitability measures by Aupperle and Hatfield (1985); McGuire and Schneeweis (1988) and Waddock and

Graves (1997). The extended literature in the field have assisted us to identify the key parameters affected by long and/or short run behavior of the firms and to carry a revised study based on a unique database generated by Dow Jones in collaboration with SAM (Sustainable Asset Management) company and their related Dow Jones Sustainability Indexes (DJSI). The database generated by this collaboration (since 1999) focuses on firms that have adopted a corporate sustainability business approach. This approach creates long-term shareholder value by embracing opportunities and managing risks deriving from economic, environmental and social developments. Corporate sustainability leaders achieve long-term shareholder value by gearing their strategies and management to harness the market's potential for sustainability products and services while at the same time successfully reducing and avoiding sustainability costs and risks.¹

The database is used to evaluate both long and short run impacts of RSER on key financial indicators. The quality of a company's strategy and management and its performance in dealing with opportunities and risks deriving from economic, environmental and social developments can be quantified and used to identify and select leading companies for investment purposes. Leading sustainability companies often display high levels of competence in addressing global and industry challenges in a variety of areas:

- (1) Strategy. Integrating long-term economic, environmental and social aspects in their business strategies while maintaining global competitiveness and brand reputation.
- (2) Financial. Meeting shareholders' demands for sound financial returns, long-term economic growth, open communication and transparent financial accounting.
- (3) Customer and Product. Fostering loyalty by investing in customer relationship management and product and service innovation that focuses on technologies and systems, which use financial, natural and social resources in an efficient, effective and economic manner over the long-term.
- (4) Governance and Stakeholder. Setting the highest standards of corporate governance and stakeholder engagement, including corporate codes of conduct and public reporting.
- (5) Human. Managing human resources to maintain workforce capabilities and employee satisfaction through best-in-class organizational learning and knowledge management practices and remuneration and benefit programs.

Corporate sustainability performance is an investable concept. This is crucial in driving interest and investments in sustainability to the mutual benefit of companies and investors. As this benefit circle strengthens, it will have a positive effect on the societies and economies of both the developed and developing world. ²

¹The Corporate Sustainability Assessment (CSA) is SAM's main tool for identifying companies that are better equipped to identify and respond to emerging opportunities and risks resulting from global sustainability trends. The Corporate Sustainability Assessment, for screening corporate by SAM, is based on a questioner with over 100 questions on financially material economic, environmental and social practices. Over half of the questions are industry specific as SAM is convinced that sector-specific sustainability risks and opportunities play a key role in a firm's long-term success. The other half includes questions on general sustainability issues such as corporate governance, product stewardship and talent attraction and retention.

²Previous studies have mainly used to information on CSR supplied by the firm of Kinder, Lyfenberg, and Domini (henceforth KLD) which began compiling CSR information in 1991. KLD provides information on Corporate Social Performance (CSP), a proxy for CSR. KLD uses a combination of surveys, financial statements, articles, academic journals and government reports to

Our analysis is based on Dow Jones Sustainable Indexes. Launched in 1999, the Dow Jones Sustainability Indexes (DJSI) are the first global indexes tracking the financial performance of the leading sustainability-driven companies worldwide. Based on the cooperation of Dow Jones Indexes and SAM they provide asset managers with reliable and objective benchmarks to manage sustainability portfolios.

In what follows, we statistically assessed the relationship between Corporate Sustainability behavior and financial performance. To this end, we compare the financial performance of all firms that composed the US DJSI index during 2008-2010, being the most proactive companies in providing services and goods while maintaining ethical responsibility and environmental sustainability. Companies included in the analysis belong to 9 distinct sectors and related industries in the sectors. Mean financial performance is valued at three levels: a) the industry level; b) the sector level (considering 9 sectors); and at a more general benchmark, c) the US market portfolio that is represented by *SP500* index.

2. METHODOLOGIES AND HYPOTHESES

Corporate Sustainability is valued by statistically comparing the mean of financial performance and risk measures of 99 firms included in the DJSI US index in 2008-2010 with that of three benchmark levels. The first benchmark is the related industry performance; the second is the same sector performance; and the third, relates to the majority of stock exchange market portfolio performance measures, represented by SP 500 index. All financial data used in this research was collected from the REUTERS financial markets database and combined with Dow Jones and SAM database of firms that have composed the US DJSI indexes. Table 2 includes the full list of sectors and industries considered in this study. Classification follows the Dow Jones classification. We define the following primal null hypothesis: there is no significant difference between the mean performance and risk measures of DJSI and the benchmarks. Hence, three null hypotheses for the mean performance or risk measures differences are defined:

$$(1) \quad H_0 : \mu_{DJSI} - \mu_i = 0$$

$$(2) \quad H_1 : \mu_{DJSI} - \mu_i \neq 0,$$

$$(3) \quad H_0 : \mu_{DJSI} - \mu_j = 0$$

$$(4) \quad H_1 : \mu_{DJSI} - \mu_j \neq 0,$$

$$(5) \quad H_0 : \mu_{DJSI} - \mu_{sp} = 0$$

$$(6) \quad H_1 : \mu_{DJSI} - \mu_{sp} \neq 0,$$

where index i stands for the industry benchmark and index j stands for the sector benchmark. sp subscript stand for the market portfolio *SP500*.

Our analysis includes the examination of the following six core hypotheses, tested using the relevant financial performance parameters. Based upon the conviction

asses CSP along eleven dimensions: military contracting, nuclear power, gambling, tobacco, alcohol, community relations, diversity, employee relations, product quality (innovation, research and development), and non-U.S. operations (environment and labor relations). Base on this information KLD constructed the Domini 400 Social Index (DSI 400), which is the equivalent to *SP500* Index adjusted to socially responsible firms. There are clear limitations in order to be included in the DSI 400 index, i.e., not more than 2% of the gross revenue arrives from military weapons, no involvement in nuclear power, gambling, tobacco, alcohol etc Ibid p. 607. Inclusion of a firm in the DSI 400 index results in a dummy variable for SCR.

that the merits of long-term pro environment policies exceed their drawbacks our general alternative hypothesis considers that CSR firms are characterized by higher performance measures and lower risk measures. The six hypotheses to be tested are the following:

Hypothesis H1 : Corporate SRER is positively correlated with Profitability Ratios. In order to examine the conjecture that high SRER is positively correlated with profitability measures, we examine the profitability measures mean difference between DJSI firms and its three benchmarks. We hence examine the profitability measures of sales adjusted gross earning, **GrossE** (%), sales adjusted earnings before interest taxes depreciation and amortization, **EBITDA** (%), sales adjusted operating earnings, **OperatingE** (%), sales adjusted net earnings, **NetE** (%), dividend to price ratio or dividend return **Div**(%), and five year cumulative earning per share increase, **EPSGrow** (%). All of the above except **EPSGrow** (%) are calculated as the last five years average measure and reflects different accounting and economic performance measures that eventually result in an ongoing value creation process or corporate market value change.

Hypothesis H2: SRER is positively correlated with Business Maturity Ratios. To examine the conjecture that high SRER is positively correlated with business maturity of the corporation we examine business maturity measures mean difference between DJSI firms and its three benchmarks. We concentrate on measures that typically signal a rather advanced phase of the business life which allows undertaking of sustainable opportunities. We expect that firms with high SRER will be characterized by a relatively low (five years cumulative) dividends growth, **DivGrow** (%), and with high (last year) dividends to profit payout ratio, **Div/E** (%). For similar reasoning, we expect SRER firms to have lower (five years cumulative) sales growth ratios, **SalesGrow** (%). All these measure reflect a status in which the firm have already completed a quick growth phase and entered into a steadier business period. Therefore, it can spare funds for the purpose of long term SRER policy.

Hypothesis H3: SRER is positively correlated with Higher Liquidity and Lower Financial Leverage Ratios. To examine this conjecture of positive association with high financial liquidity ratio we compare the Current Ratio, **Current**, and the Quick Ratio, **Quick**, of the DJSI firms to the three respected benchmark. We expect to find higher liquidity ratios for the SRER firms. Likewise, we presume that the more sustainable corporations incorporate lower levels of capital funding risk, and hence will demonstrate lower financial leverage. Differently from most studies that considered financial leverage, however, we examine not only the classic financial leverage, i.e., total debt to equity **TD/Eq**, but also the long term financial leverage, i.e., long term debt to equity **LTD/Eq**. We conjecture that the capital funding horizon should not affect the anticipated pattern of lower leverage for the more socially responsible DJSI firms.

Hypothesis H4: SRER is positively correlated with Managerial efficiency ratios. Previous studies presume that high CSR categorization will be associated with better managerial performance measures. We test this hypothesis for SRER corporations by statistically comparing the mean of common managerial efficiency measures ratios, including Return on Assets, **ROA** (%),

Return on Investment, **ROI** (%), and Return on Equity, **ROE** (%), with the corresponding three level benchmark. To capture the ongoing performance trend of the corporation, these measures are calculated over the five years average (2005 – 2009).

Hypothesis H5: SRER is positively correlated with Operating efficiency ratios. To examine this hypothesis we employ two measures of mean difference tests of operating aspect. The one is the revenue per worker ratio **REV/Emp** (%) difference between the DJSI firms and their benchmarks, and the other, is represented by the net profit per worker ratio, **NetE/Emp** (%) difference. We expect to find higher operating efficiency for the CSR firms.

Hypothesis H6: SRER is correlated with Higher Yearly sales growth ratio. As we incline to identify high SRER firms as more immune to 2008 economic crises (the defensive firm hypothesis) we expect a significant higher yearly sales growth, **SalesG-Crisis** (%) in 2009 for the CSR firms than for the three benchmarks levels.

The six core hypotheses and their sub hypotheses are summarized into table 3. The table show in total 19 different hypotheses that are examined using t-test for mean difference for matched observations. Each of the hypotheses is tested with respect to three different benchmark levels: the industry, the sector and the market represented by the market, SP500. We hence define the matched observations difference \bar{D}_k , $k \in \{1, \dots, 99\}$ of the DJSI corporations, such that the difference mean estimator is given by:

$$(7) \quad \bar{D} = \mu_{DJSI} - \mu_b,$$

where b stands for each of the benchmarks $b = \{i, j, sp\}$. The matched observations one sample t- statistic according to a null of zero difference and a standard deviation of S_D for that difference is given by:

$$(8) \quad \frac{\bar{D}}{S_D} n^{1/2} \sim t(n-1).$$

3. RESULTS

In the next tables we present the results of the different hypotheses tests with respect to the three benchmark levels. Examining the overall results enable us to characterize the SRER firms that entered the prestigious club of US DJSI, comprised of the top 90 percentile firms that advances corporate sustainability management in the US, and position their performance relative to other corporations in same industry, and relative to the sector. Table 4 presents the results of the mean difference test for the performance measures between the DJSI firms and the respected matched firms. The table clearly shows that the DJSI firms have higher profitability measures of all phases of profit, dividend return and Earning per share growth when compared with either the same industry or the same sector. In accordance with our prediction for the alternative hypotheses, the mean difference of the profitability measures is positive and highly significant. As for the SP 500 benchmark, not only we can not reject the null hypothesis but we see that for some profitability measure such as EBITDA, OperatingE, and NetE. The market profitability measures signals a highly significant negative mean difference.

Table `reft:h2` displays the results of the mean difference test for the business maturity measures between the DJSI firms and the respected matched firms. We can see that when compared to the same industry and the sector, the DJSI firms are characterized by statistically significant higher dividend payout (high Div/E backs business maturity) and cumulative sales growth (high SalesGrow rejects business maturity). While the DJSI Div/E demonstrates higher business maturity than its industry and sector counterparts, a comparison with the entire stock market shows a significantly higher business maturity for all SP 500 stocks than for the pro environment DJSI firms.

An additional interesting characteristic of SRER firms is hinged in the following hypotheses testing in Table 6. This table includes the analysis of liquidity and financial leverage of the DJSI companies. Contrary to our expectation we see that the DJSI are characterized by statistically significant lower immediate liquidity measures, i.e., negative and significant mean difference for the current and quick ratios. The classical leverage of DJSI firms, TD/Eq, which represents the total debt to equity ratio, is lower but not significant when compared with the industry. The total debt DJSI leverage difference is negative and significant regarding to the sector and the entire stock market, in accordance with our expectation and former research findings. However we conduct a unique examination of the long run debt to equity ratio comparison of the pro environmental and social corporations. Contrary to our expectations and previous studies, we find that the long run debt to equity ratio, LTD/Eq, in the industry and the related sector is higher (and statistically significant) than that of the DJSI firms. Both total and long run leverage of DJSI is lower in comparison to the total market, SP 500, leverage. The significantly higher long term leverage of the DJSI firms in comparison to the industry and the sector is an important finding. It shows that the capital structure of DJSI firms is based on long run plans rather than on short range. Hence we identify another potential explanation to the high involvement of the DJSI in pro social policies. As these SRER firms choose to fund its business activities from long run debt sources, they are heavily bound with different components of society. Hence, they signal investors about their high concern about social issues, perhaps to decrease long term cost of capital. Another fundamental argument could be that firms that depend on long term borrowing from society are by definition more concern about society.

In table 7 we present the managerial efficiency measures test of the DJSI firms and the respected three benchmark levels. We can clearly see that DJSI firms have higher and significant managerial efficiency measures, i.e., all the measures mean difference of the DJSI firms ROA, ROI, and ROE are positive and highly significant. Nevertheless, we see from the table that we cannot reject the null that the DJSI and the entire market have different managerial efficiency measures.

In table 8 we test a set of hypotheses concerning the operating efficiency of SRER firms in comparison to the benchmark levels. Although we expected these firms to demonstrate higher operating measures we find a significantly lower operating performance measures in comparison to each of the benchmarks. We find a negative difference of the revenue per worker or net earnings per worker, statistically significant at the 99% confidence level. This finding is interesting as we have previous shown (table 4 analysis) that the profit measures are consistently higher for the DJSI firms when compared with the industry and the sector. This was so when testing the hypotheses with respect to net earnings of the DJSI (NetE). We therefore conclude that SRER companies employ a larger number of workers compared to other companies in the same industry. This is so also at the sector level. Employing a larger number of workers is naturally to higher sensitivity towards long term

social issues and vice versa. This results in a considerable lower value of per-worker operating efficiency measures.

Finally, table 9 presents the defensive hypothesis test for the DJSI firms in comparison to the three benchmarks. The defensive hypothesis examines the adaptation rate of a firm to economic crises by measuring its sales growth rate post an economic crisis. Originally we had conjectured that the DJSI will show a higher defensive ability. Nevertheless, from table 8 we see that the DJSI mean difference with the industry, sector and the entire stock market, is negative and highly significant. It seems that the immediate post economic crisis sale growth reaction of the DJSI CSR firms is lower than every possible benchmark level. The moderate response following crisis corresponds to couple of findings from table 6 and table 7 from which we infer that the entire activity planning and of the DJSI firms is aimed for the long run periods, and therefore they adopt a non myopic long run pro social policies.

4. CONCLUDING REMARKS

Our analysis have assessed three key characteristics of firms caring corporate social responsibility. The first is related to profitability measures. CRS firms are characterized by significant higher profit measures than the industry and the sector, though not higher than the entire market. The second relates to Liquidity and financial leverage. The short term liquidity of the DJSI index firms is significantly lower than that of the industry and the sector. Interestingly, the total leverage of the high SRER corporations is significantly lower than that that of the industry and the sector, but the long term leverage is significantly higher. We could phrase this result saying "SRER corporations look far beyond today, and hence, also care more about social long term issues". The third relates to higher involvement of with employees and long term point of view. High SRER corporations are characterized by significantly higher managerial efficiency ratios than the respective industry and the sector. The per-worker ratios are significantly lower than all the benchmarks. We conjecture that these high SRER firms are characterized by high number of employees, and hence bear higher environmental awareness. Our study sharpen previous literature that have primarily focused on Corporate Social Responsibility and financial performance to a unique subgroup that foster Sustainable Social Responsibility, emphasizing the need to build the corporation and society at large looking far beyond the needs of today. Our analysis supports to vision that Sustainability is a company's capacity to prosper in a competitive and changing global business environment by anticipating and managing current and future economic, environmental and social opportunities and risks. Companies that address these factors through innovation, quality and productivity enhance their ability to generate long-term shareholder value. The adoption of sustainable practices is a long-term systematic approach that integrates economic, environmental and social considerations into traditional financial operation.

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| List of Sectors $j=\{1, \dots, 6\}$ and sub industries $i=\{1, \dots, 108\}$ | | | |
|--|----|---|----|
| Sector 1: Financial Services & Real Estate | | Personal Services | 54 |
| Banks | 1 | Restaurants | 55 |
| Consumer Financial Services | 2 | Retail - Apparel & Accessories | 56 |
| Financial Services - Diversified | 3 | Retail - Catalog & Internet Order | 57 |
| Financials - Speciality | 4 | Retail - Computers & Electronics | 58 |
| Home Furnishing | 5 | Retail - Department Stores | 59 |
| Homebuilding | 6 | Retail - Discount Stores | 60 |
| Insurance - Life & Health | 7 | Retail - Drugs | 61 |
| Insurance - Multiline | 8 | Retail - Specialty | 62 |
| Insurance - Property & Casualty | 9 | Textiles & Leather Goods | 63 |
| Investment Services | 10 | Tires & Rubber Products | 64 |
| Investment Trusts | 11 | Tobacco | 65 |
| Real Estate Operations | 12 | Sector 5: Energy | |
| Reinsurance | 13 | Coal | 66 |
| REIT - Residential & Commercial | 14 | Integrated Oil & Gas | 67 |
| Sector 2: Technology, Media & Telecommunications | | Oil & Gas Drilling | 68 |
| Advertising/Marketing | 15 | Oil & Gas Exploration & Production | 69 |
| Broadcasting | 16 | Oil & Gas Refining & Marketing | 70 |
| Communications Equipment | 17 | Oil Related Services & Equipment | 71 |
| Computer Hardware | 18 | Sector 6: Industrials, Materials & Utilities | |
| Entertainment Production | 19 | Aerospace & Defense | 72 |
| Integrated Telecommunications Services | 20 | Air Freight & Courier Services | 73 |
| IT Services & Consulting | 21 | Airlines | 74 |
| Media Diversified | 22 | Airport Services | 75 |
| Office Equipment | 23 | Aluminum | 76 |
| Publishing | 24 | Chemicals - Agricultural | 77 |
| Semiconductor Equipment & Testing | 25 | Chemicals - Commodity | 78 |
| Semiconductors | 26 | Chemicals - Diversified | 79 |
| Software | 27 | Chemicals - Specialty | 80 |
| Wireless Telecommunication Services | 28 | Commercial Printing Services | 81 |
| Sector 3: Healthcare | | Commercial Services & Supplies | 82 |
| Advanced Medical Equipment | 29 | Construction - Supplies & Fixtures | 83 |
| Biotechnology | 30 | Construction & Agricultural Machinery | 84 |
| Healthcare Facilities | 31 | Construction Materials | 85 |
| Managed Health Care | 32 | Diversified Trading & Distribution | 86 |
| Medical Equipment, Supplies & Distribution | 33 | Electrical Components & Equipment | 87 |
| Pharmaceuticals - Diversified | 34 | Engineering & Construction | 88 |

TABLE 1. List of Sectors and Related Industries for hypotheses testing of gaps between the performance of a corporation k listed in DJSI and its associated industry i and sector j .

| | | | |
|--|----|----------------------------------|-----|
| Pharmaceuticals - Generic & Specialty | 35 | Environmental Services | 89 |
| Sector 4: Consumer Goods & Retail | | Forest & Wood Products | 90 |
| Apparel & Accessories | 36 | Heavy Electrical Equipment | 91 |
| Appliances, Tools & Housewares | 37 | Highways & Rail tracks | 92 |
| Auto & Truck Manufacturers | 38 | Industrial Conglomerates | 93 |
| Auto/Truck/Motorcycle Parts | 39 | Industrial Machinery & Equipment | 94 |
| Beverages - Brewers | 40 | Marine Port Services | 95 |
| Beverages - Distillers & Wineries | 41 | Marine Transportation | 96 |
| Beverages - Non-Alcoholic | 42 | Mining & Metals - Specialty | 97 |
| Casinos & Gaming | 43 | Non-Paper Containers/Packaging | 98 |
| Consumer Electronics | 44 | Paper Packaging | 99 |
| Fishing & Farming | 45 | Paper Products | 100 |
| Food Distribution & Convenience Stores | 46 | Precious Metals & Minerals | 101 |
| Food Processing | 47 | Rails & Roads - Freights | 102 |
| Footwear | 48 | Rails & Roads - Passengers | 103 |
| Hotels, Motels & Cruise Lines | 49 | Steel | 104 |
| Household Products | 50 | Utilities - Electric | 105 |
| Leisure & Recreation | 51 | Utilities - Multiline | 106 |
| Leisure Products | 52 | Utilities - Natural Gas | 107 |
| Personal Products | 53 | Utilities - Water & Others | 108 |

TABLE 2. List of Sectors and Related Industries for hypotheses testing of gaps between the performance of a corporation k listed in DJSI and its associated industry i and sector j .

| The Core Alternative Hypotheses | Performance / Risk Measure |
|---|----------------------------|
| H₁: CSR Excess profitability | |
| H _{1,1} : $\mu_{\text{DISI}} - \mu_b (\text{GrossE}) > 0$ | GrossE (%) |
| H _{1,2} : $\mu_{\text{DISI}} - \mu_b (\text{EBITDA}) > 0$ | EBITDA (%) |
| H _{1,3} : $\mu_{\text{DISI}} - \mu_b (\text{OperatingE}) > 0$ | OperatingE (%) |
| H _{1,4} : $\mu_{\text{DISI}} - \mu_b (\text{NetE}) > 0$ | NetE (%) |
| H _{1,5} : $\mu_{\text{DISI}} - \mu_b (\text{Div}) > 0$ | Div (%) |
| H _{1,6} : $\mu_{\text{DISI}} - \mu_b (\text{EPSTGrow}) > 0$ | EPSTGrow (%) |
| H₂: CSR Higher Business Maturity | |
| H _{2,1} : $\mu_{\text{DISI}} - \mu_b (\text{DivGrow}) < 0$ | DivGrow (%) |
| H _{2,2} : $\mu_{\text{DISI}} - \mu_b (\text{Div/E}) > 0$ | Div/E (%) |
| H _{2,3} : $\mu_{\text{DISI}} - \mu_b (\text{SalesGrow}) < 0$ | SalesGrow (%) |
| H₃: CSR Higher Liquidity and Lower Financial Leverage | |
| H _{3,1} : $\mu_{\text{DISI}} - \mu_b (\text{Current}) > 0$ | Current (%) |
| H _{3,2} : $\mu_{\text{DISI}} - \mu_b (\text{Quick}) > 0$ | Quick (%) |
| H _{3,3} : $\mu_{\text{DISI}} - \mu_b (\text{TD/Eq}) < 0$ | TD/Eq (%) |
| H _{3,4} : $\mu_{\text{DISI}} - \mu_b (\text{LTD/Eq}) < 0$ | LTD/Eq (%) |
| H₄: CSR Higher Managerial Efficiency | |
| H _{4,1} : $\mu_{\text{DISI}} - \mu_b (\text{ROA}) > 0$ | ROA (%) |
| H _{4,2} : $\mu_{\text{DISI}} - \mu_b (\text{ROI}) > 0$ | ROI (%) |
| H _{4,3} : $\mu_{\text{DISI}} - \mu_b (\text{ROE}) > 0$ | ROE (%) |
| H₅: CSR Higher Operating Performance | |
| H _{5,1} : $\mu_{\text{DISI}} - \mu_b (\text{REV/Emp}) > 0$ | REV/Emp (%) |
| H _{5,2} : $\mu_{\text{DISI}} - \mu_b (\text{NetE/Emp}) > 0$ | NetE/Emp (%) |
| H₆: CSR Higher Defensive | |
| H _{6,1} : $\mu_{\text{DISI}} - \mu_b (\text{Current}) > 0$ | SalesG_Crisis (%) |

TABLE 3. List of tested hypotheses aimed to statistically assess differences between SRER companies and related benchmark performance. Three benchmarks are considered: industry benchmark; Sector benchmark, market benchmark.

| H₁: Excess profitability | | | | | | | |
|--|------------------|--------------------|---------|--------------------|---------|-----------------------|---------|
| Benchmark: | | Industry | | Sector | | S&P 500 | |
| Measure Difference | | $\mu_{DJSI}-\mu_i$ | p-value | $\mu_{DJSI}-\mu_j$ | p-value | $\mu_{DJSI}-\mu_{sp}$ | p-value |
| GrossE (%) | H _{1,1} | 6.524*** | 0.001 | 8.800*** | 0.000 | 2.186 | 0.320 |
| EBITDA | H _{1,2} | 3.589*** | 0.002 | 4.557*** | 0.000 | -2.375** | 0.034 |
| OperatingE | H _{1,3} | 3.341*** | 0.001 | 3.286*** | 0.002 | -4.922*** | 0.000 |
| NetE (%) | H _{1,4} | 2.188** | 0.012 | 2.388*** | 0.007 | -4.095*** | 0.000 |
| Div (%) | H _{1,5} | 0.527*** | 0.000 | 0.549*** | 0.000 | -0.174 | 0.234 |
| EPSGrow | H _{1,6} | 7.527*** | 0.000 | 9.599*** | 0.000 | -0.571 | 0.780 |

TABLE 4. The Mean Difference t-test for Performance Measures. The table shows the Mean Difference t-test for performance measures with respect to the three benchmark level. *,** and *** indicate 90 %, 95 % and 99% confidence levels, respectively.

| H₂: Higher Business Maturity | | | | | | | |
|--|------------------|--------------------|---------|--------------------|---------|-----------------------|---------|
| Benchmark: | | Industry | | Sector | | S&P 500 | |
| Measure Difference | | $\mu_{DISI}-\mu_i$ | p-value | $\mu_{DISI}-\mu_j$ | p-value | $\mu_{DISI}-\mu_{sp}$ | p-value |
| DivGrow (%) | H _{2,1} | 1.527 | 0.358 | 0.871 | 0.498 | 2.491* | 0.059 |
| Div/E (%) | H _{2,2} | 24.369*** | 0.000 | 28.657*** | 0.000 | -12.413** | 0.020 |
| SalesGrow(%) | H _{2,3} | 2.261** | 0.012 | 3.120*** | 0.000 | -4.673*** | 0.000 |

TABLE 5. The Mean Difference t-test for Business Maturity Measures. The table shows the Mean Difference t-test for business maturity measures with respect to the three benchmark level. *,** and *** indicate 90 %, 95 % and 99% confidence levels, respectively.

H₃: Higher Liquidity and Lower Financial Leverage of SRER

| Benchmark: | | Industry | | Sector | | S&P 500 | |
|-------------------|------------------|--------------------|---------|--------------------|---------|-----------------------|---------|
| | | $\mu_{DJSI}-\mu_i$ | p-value | $\mu_{DJSI}-\mu_j$ | p-value | $\mu_{DJSI}-\mu_{sp}$ | p-value |
| Current | H _{3,1} | -0.191** | 0.038 | -0.279*** | 0.003 | 0.131* | 0.051 |
| Quick | H _{3,2} | -0.190** | 0.013 | -0.330*** | 0.000 | -0.046 | 0.345 |
| TD/Eq | H _{3,3} | -4.484 | 0.716 | -22.266* | 0.092 | -92.457*** | 0.000 |
| LTD/Eq | H _{3,4} | 20.826** | 0.024 | 19.599** | 0.028 | -54.589*** | 0.000 |

TABLE 6. The Mean Difference t-test for Maturity Measures. The table shows the Mean Difference t-test for liquidity and financial leverage measure with respect to the three benchmark level. *,** and *** indicate 90 %, 95 % and 99% confidence levels, respectively.

| H₄: Higher Managerial Efficiency | | | | | | | |
|--|------------------|--------------------|---------|--------------------|---------|-----------------------|---------|
| Benchmark: | | Industry | | Sector | | S&P 500 | |
| Measure Difference | | $\mu_{DJSI}-\mu_i$ | p-value | $\mu_{DJSI}-\mu_j$ | p-value | $\mu_{DJSI}-\mu_{sp}$ | p-value |
| ROA (%) | H _{4.1} | 2.318*** | 0.000 | 2.660*** | 0.000 | -0.950 | 0.110 |
| ROI (%) | H _{4.2} | 3.875*** | 0.000 | 4.457*** | 0.000 | 0.324 | 0.758 |
| ROE (%) | H _{4.3} | 7.729*** | 0.000 | 8.069*** | 0.000 | -2,349 | 0.104 |

TABLE 7. The Mean Difference t-test for Managerial Efficiency Measures. The table shows the Mean Difference t-test for managerial efficiency measures with respect to the three benchmark level. *,** and *** indicate 90 %, 95 % and 99% confidence levels, respectively.

| H₅: Higher Operating Performance SREER | | | | | | | |
|--|------------------|---|---------|---|---------|---|---------|
| Benchmark: | | Industry | | Sector | | S&P 500 | |
| Measure Difference | | $\mu_{\text{DJSI}} - \mu_{\text{Bench.}}$ | p-value | $\mu_{\text{DJSI}} - \mu_{\text{Bench.}}$ | p-value | $\mu_{\text{DJSI}} - \mu_{\text{Bench.}}$ | p-value |
| REV/Emp (USD 1,000s) | H _{5,2} | -849.631*** | 0.0008 | -8,593.4*** | 0.0000 | -149.395*** | 0.0021 |
| NetE/Emp (USD 1,000s) | H _{5,3} | -76.380* | 0.0577 | 248.366*** | 0.0000 | -27.615*** | 0.0046 |

TABLE 8. The Mean Difference t-test for Operating Performance Measures. The table shows the Mean Difference t-test for business maturity measures with respect to the three benchmark level. *,** and *** indicate 90%, 95% and 99% confidence levels, respectively.

| H₆: Higher Defensive SRER | | | | | | | |
|---|----------------|--------------------|---------|--------------------|---------|-----------------------|---------|
| Benchmark: | | Industry | | Sector | | S&P 500 | |
| Measure Difference | | $\mu_{DJSI}-\mu_i$ | p-value | $\mu_{DJSI}-\mu_j$ | p-value | $\mu_{DJSI}-\mu_{sp}$ | p-value |
| SalesG_Crisis (%) | H ₆ | -5.453*** | 0.000 | -4.454*** | 0.007 | -3.484** | 0.011 |

TABLE 9. The Mean Difference t-test for Defensive hypothesis. The table shows the Mean Difference t-test for business maturity measures with respect to the three benchmark level. *,** and *** indicate 90%, 95% and 99% confidence levels, respectively.