CORPORATE SUSTAINABILITY: Comparative Analysis of Green Portfolio in BM & FBOVESPA

Anderson Giovane Sontag (*Corresponding Author***)**
Professional Master Student in Administration from the State University of West of Paraná - State University of West Paraná - UNIOESTE (Brazil)
Santa Catarina Street, 147 - Room 01 - Central
Zip Code 85960-000 - Marechal Cândido Rondon, PR - Brazil
E-mail: *andersonsontag@hotmail.com*

Edison Luiz Leismann
Dr. of Applied Economics from the Federal University of Viçosa - UFV
Professor at the State University of Western Paraná- UNIOESTE (Brazil)
State University of West Paraná, Social Sciences Center.
University Street, 2069 - University Garden
Zip Code 85819-110 - Cascavel, PR - Brazil - Cash-Post: 711
E-mail: *elleismann@hotmail.com*

Elza Hofer
Dra. of Business Administration from the Catholic University of Paraná - PUCPR
Professor at the State University of Western Paraná - UNIOESTE (Brazil)
State University of West Paraná, Campus de Marechal Cândido Rondon, Social Sciences Center.
Pernambuco Street, 1777 - Center
Zip Code 85960-000 - Marechal Candido Rondon, PR - Brazil
E-mail: *elza_hofer@uol.com.br*

Jerry Adriani Johann
Dr. of Agricultural Engineering from the State University of Campinas - UNICAMP
Professor at the State University of Western Paraná - UNIOESTE (Brazil)
State University of West Paraná, Center of Exact Sciences and Technology, Campus of Cascavel.
University Street, 2069, LEA - Applied Statistics Laboratory (Room 65) - University Garden
Zip Code 85819-110 - Cascavel, PR - Brazil - Cash-Post: 711
E-mail: *jerry.johann@hotmail.com*

ABSTRACT

Sustainability is something that is increasingly present in organizations, thus, are companies that are incorporating this new paradigm of corporate sustainability, presenting best indicators than companies in Brazil 50 Index? The objective of the research is to verify if the main fundamentalist indicators of the portfolios have average differences, applying the hypothesis test and showing if the green portfolio have better indicators than the traditional ones. Methodologically, the research is applied, descriptive and quantitative, using statistical procedures, spreadsheets and the Action software. The work is done in the portfolios ISE, IBrX-50 and ICO2, listed on the BM&FBovespa, based on key indicators fundamentalists, whose data collection is documentary, based on the financial statements of the last balance sheet processed in 06/2014. The results indicate that one cannot say that sustainable portfolios have a different average performance from the conventional portfolio on 5% significance level.

Keywords: *Sustainability Indices; Hypothesis Test; Fundamentalist Indicators*

1 INTRODUCTION

Deciding always involves our perception of the facts and the perception verifies the information that are available, evaluating to know which way to go. The behavior in the chosen direction is a result of this initial process and, thus, it depends on the perception. To understand the decision-making it is necessary to understand how the investor perceives the situation and its consequences (Tomaselli, 2010). To Rojo (2014), in the case of individual investments, the particularities should be taken into account, and they range from family interference, to formal education, religious values and many others, depending on each person. At a time when sustainable

development has been approached in institutions, sustainability becomes part of the investor's profile. Rojo (2014) also explains that the decision process is something unique of each being, that it is complex and cannot be determined by an absolute standard.

Investors tend to be chartists or fundamentalists. The first ones use a technical analysis that projects the behavior of stock prices based on quotations, seeking graphic patterns that signal the stock price behavior in the future. On the other hand, fundamentalist investors use the economic and financial indicators obtained from financial statements, justifying the use understanding that the market has prices distorted in relation to what the company is actually worth. Analyzing survey about investors by Rojo (2014), one can see that the most frequently used indicators are: stock price divided by earnings per share (P/E), stock price divided by book value per share (P/BV), dividends paid per share divided by the stock price (dividend yield), increase in net revenue in the last five years (R5a), book value per share (VPS), earnings per share (EPS), net income divided by net revenue (net margin), return on invested capital (ROIC), return on equity (ROE) and current assets divided by current liabilities (current ratio).

Rojo (2014) comments that the capital market is one of the results of the financial system, responsible for allocating capital for investments and organizational development, assuming a key role in the economic development of a country, allowing an alternative for investors fundraising that, when financing the risk ventures, are seeking better pay.

To Sousa Silva, Ribeiro and Weffort (2014), in an analysis of the market value of the companies and the effects of the disclosure of voluntary information with economic information surplus beyond required by law, has a positive effect, which represents an increase of collateral that underlies the choices and investment decisions. However, they pointed out a negative relationship between the market value and the voluntary environmental disclosure, assuming there is a tradeoff between the management vision and expectations of investors, not recognizing the effects of environmental disclosure immediately. Nevertheless, the tendency towards increased disclosure of this nature reveals changes evidences in the way of managing the business, expanding the relationship of the companies to other vicarious agents. In this sense, Rezende, Nunes and Portella (2008) comment that the concern with the environment through sustainable development and social responsibility and corporate governance practices, is creating a demand within the financial market for products geared to that niche. In addition, the companies search for sustainability, combining financial success with environmental and social issues, has increased in recent years.

Rojo (2014) mentions that companies go public on the stock exchange in order to raise new funds, because in that case the company gets a source without incurring the interest of banks to leverage the business. The investor seeks the return on capital, seeking better returns.

To Rezende, Nunes and Portela (2008), it is observed that the studies on the financial performance of socially responsible investments have several results, which, in most cases, indicate similar performance, but still have weakness and inconsistencies. In the context of sustainability, **are companies incorporating the new paradigm of corporate sustainability, represented by the ones composing the sustainable indices: Corporate Sustainability Index (CSI) and Efficient Carbon Index (ICO2), presenting best indicators than companies from the Brazil 50 index (IBrX-50)**?

The overall objective of the research is to verify if the main fundamentalist indicators of the portfolios have average differences, applying the hypothesis test and showing if the green portfolios have better indicators than the traditional ones. Specifically, tested indicators are P/E, P/BV, dividend yield, asset turnover, EPS, VPS, ROIC, ROE, liquidity and current debt. For those related to stock indicators, no distinction is made in preferred or common and indicators related to the financial statements it is considered the company and avoiding duplication of data.

The research is justified on the need to check if companies that comprise the CSI and ICO2 portfolios (green) have better fundamentalist indicators than the IBrX-50 (traditional) and whether investors end up having a better return by investing in sustainable funds. Studies such as Rezende, Nunes and Portela (2008), Cavalcante, Bruni and Costa (2009) and Machado, Machado and Corrar (2009), analyze the performance of portfolios in time, but it was decided, at this time, to analyze the fundamentalist indicators from a specific period.

2 THEORETICAL FOUNDATION

Sustainability should be understood as a way to meet the needs of the present inhabitants without compromising the ability of future generations to meet their own needs. The main document related to sustainable development

is the Brundtland Report (1987), entitled "Our Common Future", that defines as achieved when "the needs of current residents without compromising the ability of future generations to meet their needs."

To address issues related to sustainability the integration of the three dimensions of sustainable development is needed: economic, social and environmental, in which, without these three pillars it does not hold. One can also involve technological, cultural, territorial and government issues to complement the support, as is the Brazilian Agenda 21, which "advocates the idea of sustainability, permeating all aspects of life: economic, social, territorial, scientific and technological, policy and cultural" (Brazil, 2000, p. 10), linking the government, the productive sector and the society.

According to Machado, Machado and Corrar (2009), corporate sustainability, corporate social responsibility, business ethics, corporate citizenship, corporate social performance, and triple bottom line are some of the terms used to highlight corporate responsibility, beyond the purely financial.

Corrar (2002) mentions, in some situations, a conflict between the competitiveness and environmental sustainability, as successful companies are always looking to differentiate themselves from their competitors and gain greater market share; still, the company that has best waste treatment processes or use of clean technologies, may result in additional production costs. If this is not perceived by its customers, it may represent fall of their competitiveness and their ability to survive in the medium and long term, injuring the principle of sustainable development economic growth. The author believes that, if the focus is economic, the sustainability of a company can be measured by the ability to maintain its above-average performance in the end, that is, provide a sustainable competitive advantage. A way of measuring the economic sustainability is by its financial indicators.

Sustainability indices related to performance, management, membership, the positive and negative effects and investor behavior has been the focus of several studies. Rezende, Nunes and Portela (2008), stand out, in a study on the financial performance of the Bovespa index of corporate sustainability, from December 2005 to March 2007 (through the use of statistical tests), that although the CSI have a different theoretical portfolio, focused on social, environmental and ethical issue, its return is similar to the figure of conventional actions.

Cavalcante, Bruni and Costa (2009), through a theoretical portfolio confronted the performance of CSI shares from December 2005 to December 2006, with portfolios that form the Bovespa index (Ibovespa) and the Brazil Index (IBrX), showcasing that there was not superior performance from the CSI in the period after its creation, but there were indications that the late portfolios ISE performed better in the period before the creation of the index, suggesting that pricing would have occurred before its official launch and great of the best performance achieved by the CSI in the run up its creation can be attributed to the performance of financial institutions that compose it.

Machado, Machado and Corrar (2009), aimed at investigating if the average profitability of the Corporate Sustainability Index is statistically equal to the profitability of other BOVESPA indices, from December 2005 to November 2007. The results may not lead to the conclusion that socially responsible investments have the same return of investment that do not adopt the same position, but the average rate of return is similar, since a significant number of companies make up more than one index simultaneously.

In a study on the impacts from the sustainability index in the image of the companies, Figueiredo, Abreu and Las Casas (2009), evaluate how consumer students react to participation of companies in the CSI, checking the reflexes to the organization image, according to the vision of the consumer student, and what the role of green marketing is in this context. At that moment one could verify a significant percentage of ignorance of the existence and significance of the CSI and companies that comprise it, including by officials of those classified in the indicator, which shows the lack of disclosure by companies of the actions that led to the rating in the indicator.

In this sense, Corner (2010) analyzed annual sustainability reports, comparing the companies listed on the Dow Jones Sustainability Index. Demonstrating that they have at their disposal, and without additional cost, corporate communications for use as marketing tools that could improve its reputation with shareholders, attract sensitive investors with social responsibility, and attract talented people who want to work for a socially economically and environmentally sustainable organization. So, if the corporations that made the effort to become more sustainable and have proven its sustainability, taking the necessary steps to become part of the Dow Jones Sustainability Index, do not use their annual reports and do not disclose to consumers, investors and other stakeholders their sustainable actions, they are losing lucrative marketing opportunities.

Analyzing environmental disclosure of companies from potentially polluting sectors listed in the CSI, Oliveira, Machado and Beuren (2012), sought to identify the level of environmental character of disclosure disclosed voluntarily, concluding that due to fact that the environmental disclosure in Brazil does not have coercive character, the companies do not meet the principle of full disclosure. Being more common to report positive aspects than negative ones of the company's relationship with the environment, reporting qualitative data, suppressing monetary values, especially if they are negative in character to the company's image and the lack of audit of these accounts can harm the quality of disclosure.

Machado, Macedo, Machado and Siqueira (2012) analyzed the relationship between socio-environmental investments and the company inclusion in the CSI, demonstrating that there is a relationship and business investment, made and documented with social and environmental issues are seen as evidence of real commitment with social responsibility and sustainability and not simply a form of accountability of the invested funds.

Nunes, Teixeira, Nossa and Galdi (2010) and Andrade, Bressan, Iquiapaza and Moreira (2013) investigated the variables that influence the adherence of companies to the CSI index, concluded that there is evidence that the size of companies and the business sector are determinants that influence adherence and as those listed companies have a lower market value, increased profitability, higher capacity to pay, larger size, lower short-term debt and lower revenue growth. Location variables, ownership concentration, being issuing American Depositary Receipt (ADR) and being state-owned, statistically, have no influence relationship for inclusion of the companies in the CSI.

Lameira, Ness Jr, Quelhas, Pereira (2012) mention the relationship between participation in the Bovespa sustainability index, used as a proxy for best sustainability practices, and the concomitant practice of better sustainability rules with the management quality indicators of these companies. Furthermore, the sustainability is associated with the value via direct mediators by varying performance risk. Finally, one could verify that the market value, the degree of operating leverage, the return on assets (ROA) and the volatility are possible determinants of quality of company sustainability practices.

For Miura, Castro Júnior, Martins, Lima and Souza (2013) in a study on the global crisis and its impact on the performance of the index of BM&FBovespa, comparatively analyzing the profitability of the Ibovespa, ICG and CSI, 2008 to 2011. The results showed a strong negative correlation that can lead to a negative migration of investors to roles that were more profitable in the beginning of the crisis, but in the following years, the three indexes had a strong correlation in time of crisis and study, including all similarly.

Sousa Silva, Ribeiro and Weffort (2014), empirically investigate the relationship between the market value (measured by Tobin's Q) and voluntary disclosure of economic, social and environmental information in reports of companies listed on BM&FBovespa, from 2007 to 2011. The studies point towards a significant and positive relationship between economic voluntary disclosure and the market value of companies; and a significant negative relationship between the market value and environmental voluntary disclosure, suggesting a tradeoff between the investor and the manager's view. The surplus of economic data tends to represent additional collateral that underlies the choices and investor decisions. They also mention a short-term view from the shareholder by failing to recognize the effects of environmental disclosure immediately. However, the tendency towards increased disclosure of this nature reveals changes evidences in the way of managing the business, expanding _ the relationship of the companies to other indirect agents.

3 METHODOLOGY

According to Gil (2010), this present work was conceptualized as an applied research, because it aimed for the generation of knowledge for practical application, addressed to the solution of specific problems. In addressing the problem, the research can be classified as quantitative, by use of statistical procedures and data collection, with the help of spreadsheets for formatting information. In relation to the research objectives, it is descriptive, aiming to describe the characteristics of a given population, establishing relationships between variables.

As for the technical procedures, this work was described as documentary research, which, as Gil (2010) is based on materials that have not received an analytical treatment yet or can be reworked according to the research objectives, still being *ex-post- facto* that are made with available data, but which are analyzed statistically, involving, in this case, hypothesis testing. The deductive method was also used, starting from the global to the specific literature, what made it also be characterized as literature (Marconi & Lakatos, 2010).

The survey was conducted in the portfolios CSI, IBrX-50 and ICO2, listed on the BM&FBovespa, based on fundamentalists key indicators, whose data collection is documentary, based on the financial statements of the last balance sheet processed on 06/30/2014, provided by the website *Fundamentus*, and supplemented by the website *Caixa Econòmica Federal*, which are the primary sources of data used in the research. Secondary data were collected in articles, books and other research related to the subject.

The delimitation of the study was extended to the financial statements of June 2014, with a cross-time perspective and the main fundamentalist indicators, calculated from the companies that make up each portfolio. The population consists of 51 shares of CSI, 49 shares of IBrX-50 portfolio and 31 shares of portfolio ICO2 available on the BM&FBovespa, in the position of 08/15/2014, being the basis for the share price, with census sample. It is noteworthy that when the common and preferred shares make up the same portfolio, the financial indicators of statements from one are excluded to avoid duplication of results and that the ICO2 portfolio is contained in IBrX-50. The asset turnover indicators, the return on invested capital (ROIC) and the gross debt divided by shareholders' equity of companies in the financial sector were not available in the database.

3.1 Statistical Analysis of Data

Statistical analysis was done using spreadsheets and the Action software. Initially, an exploratory descriptive statistical analysis of each researched portfolio was made. To check if there was a performance difference between the surveyed portfolios, one proceeded to the application of hypothesis tests for independent samples at a level of 5% significance, testing the following hypotheses:

H_0: The indicators have statistically similar averages between the indices;
H_1: The indicators have statistically different averages.

In order to compare the average results of the main fundamentalist indicators, one proceeded to the application of the *T test* for independent samples, with significance level of 5%. Thus, if p-value <0.05, then there is significant average statistically difference among the studied conditions, otherwise the difference was not significant at the 5% significance level.

As the application from the T *test* for independent samples it is required to establish whether the variances are statistically the same or different, one proceeded, preliminary, the application of the *F test* – two variances with the same level of significance. In this case, p <0.05 (α = 5%) the conditions analyzed have statistically different variances, otherwise the variances were statistically equal to 5% probability.

4 DATA ANALYSIS AND RESULTS

The main results indicate that one cannot say that sustainable portfolios have a different average performance from the conventional portfolio in all indicators. The differences found were in the share price divided by earnings (P/E) considering all actions and excluding the ordinary ones (H_1). Featuring difference also in the share price divided by book value per share (P/BV) excluding the common shares. The other fundamentalist indicators presented equal averages (H_0) with 5% significance. The details of the data analysis are as follows:

The indices of the BM&FBovespa are performance indicators of a set of actions, showing the value of a particular group of roles over time, as prices can vary by factors related to the company or by external factors such as the country's growth, the level of employment and the interest rates. The contents are divided into: large indexes: Bovespa Index (Ibovespa), Brazil 50 Index (IBrX 50), Brazil 100 Index (IBrX 100), Brazil Broad Index (IBrA); segment indices: *MidLarge Cap* index (MLCX), *small caps* (SMLL), 2nd row value (IVBX 2), dividends (IDIV); sector indexes: Index electricity (IEE), Industrial Index (INDX), consumption index (ICON), real estate index (IMOB), financial index (IFNC), basic materials index (IMAT), utility index (UTIL); governance index: differentiated corporate governance (IGCX), *trade* corporate governance (IGCT), new market corporate governance (IGC - NM), special *tag along* (ITAG); and sustainability indexes: corporate sustainability index (CSI) and carbon efficient index (shares of portfolio ICO2). The research specifically addresses the portfolios CSI, ICO2 and IBrX 50:

The Corporate Sustainability Index (CSI): aims to create an investment environment compatible with the demands of sustainable development and encourage the ethical responsibility of corporations. Started in 2005, it is a tool for comparative analysis of the companies' performance listed on the BM&FBovespa under aspect of corporate sustainability, based on economic efficiency, environmental balance, social justice and corporate governance. It also seeks to widen the understanding of companies and groups committed to sustainability, differentiating them in terms of quality, level of commitment to sustainable development, equity, transparency and accountability, nature of the product, in addition to business performance in economic-financial, social, environmental dimensions and climate change (BM&FBOVESPA, 2014).

The Carbon Efficient Index (ICO2): Considering the world's concerns about global warming, BM&FBovespa and the National Bank for Economic and Social Development (BNDES), in a joint initiative, have decided to create the new market index. This indicator consists of the shares of the companies participating in the IBrX-50 index that agreed to participate in this initiative by adopting transparent practices with respect to their emissions of greenhouse gases (GHG), taking into account for consideration of shares of companies, their degree of GHG emission efficiency, in addition to the free float (total shares outstanding) of each (BM&FBOVESPA, 2014).

The Brazil 50 Index (IBrX-50): is an index that measures the total return on a theoretical portfolio composed of 50 stocks selected among the most traded on the BM&FBovespa in terms of liquidity, weighted in the portfolio by the market value of the shares available for trading. Being designed to be a benchmark for investors and portfolio managers, and to allow the launching and derivatives (futures, options on futures and options on index). IBrX-50 has the same characteristics of IBrX-Brazil Index, which consists of 100 shares, but has the operational advantage of being more easily reproduced by the market (BM&FBOVESPA, 2014).

In the analysis of fundamentalist indicators, the Share Price divided by Earnings per share (P/E) indicates the number of years that it would take to recover the capital invested in the purchase of a stock, by receiving from the profit generated by the company, whereas remain constant (Fundamentus, 2014). Table 1 has a statistical summary of the portfolios, given to analysis the smaller the better. The CSI showed on average better indicators (H_1) that the portfolios IBrX-50 and ICO2 (H_0). Still, CSI submitted a minimum of -19.70 and distribution of quartiles was always below. The variance was also well below the other portfolios as proven by applying from the *F test*, confirming a different variation. In addition, one excluded shares comprising both the CSI and IBrX-50 portfolios and one demonstrated that they are still in this situation, statistically different (H_1).

In relation to the share price divided by book value per share (P/BV), which tells you how much the market is willing to pay on the equity of the company. On the statistical summary for the stock price divided by book value, which is the reference value for this indicator to 1.00, whereas the share price is equal to its book value. Although the CSI is less valued in average than the other or closer to the book value, the three are statistically (H_0) at 5% significance, one can also realize a great variation in all portfolios. Therefore, the fact that the company compose the sustainability index not necessarily reflects in the share price, which is composed of various factors and market trends analyzed by each investor. By applying the *F test*, the CSI and IBrX-50 portfolios have the same variance and different ICO2. In addition, analyzing the CSI and IBrX-50 portfolios, they have demonstrated the statistically different averages at 5% significance (H1), excluding the ordinary ones. Introducing the average CSI of 1.60 and IBrX-50 of 3.21, i.e., the sustainable portfolio had a book value lower than the conventional.

The Dividend Yield corresponds to the dividend paid per share divided by the share price, and the income generated for the owner of the action for the payment of dividends. Table 1 has the statistical summary for dividend yield which, for interpretation, the bigger, the better. The CSI portfolio has indicators on average bigger than the ICO2, but statistically equal to IBrX-50 (H_0). However, the IBrX-50 is statistically equal to the average ICO2 at 5% of significance. There is a contrast at this point, since it was expected that the sustainable portfolios, such as CSI and ICO2, would have similar behaviors, but it does not occur in this situation. The CSI pays on average more dividends for ICO2, but statistically equal to IBrX-50. A similarity is that green portfolios in relation to the dividend yield indicator have a lower coefficient of variation and variance. Analyzing the CSI and IBrX-50 portfolios, excluding the common shares and applying the *T test*, they continue to have average statistically equal to 5% of significance (H_0).

The asset turnover is calculated by the net income divided by the total assets, indicating the efficiency with which the company uses its assets to generate sales. It represents how much the company sold for every $ 1 of total investment. The *F test* showed that the variance of the data was different for the CSI portfolio with respect to the IBrX-50 and the ICO2. The CSI portfolio showed to have a smaller turning than the other portfolios, but on average, they are all equal to 5% of significance (H_0). In addition, analyzing the CSI and IBrX-50 portfolios, excluding joint ventures and applying the T test, they continue to have average statistically equal to 5% of significance (H_0).

Earnings per share (EPS) indicate how much of the profit corresponds to each action. It must necessarily be presented by the Corporation after net income in the Income Statement (Matarazzo, 2010). Table 1 shows the statistical summary for earnings per share, where the *F test* shows that ICO2 has an equal variance of CSI and IBrX-50, but both have different variance with each other. The CSI portfolio has a lower average earnings per share, but it is statistically equal to 5% of significance (H_0). In addition, analyzing the CSI and the IBrX-50 portfolios, excluding joint ventures and applying the T test, continue to have average statistically equal to 5% of significance (H_0).

The book value per share (VPS) indicates the relationship between the equity and the number of shares of the share capital, and shows the representation of an action before the shareholder equity (Matarazzo, 2010, p. 227). In Table 2, there is the statistical summary for the book value per share. Applying the F test, all portfolios have statistically variance equal for 5% of significance, as well as averages (H_0), although the green values are greater than the portfolio IBrX50. In addition, analyzing the CSI and IBrX-50 portfolios, excluding joint ventures and applying the *T test*, they continue to have average statistically equal to 5% of significance (H_0).

The return on invested capital (ROIC) is calculated from EBIT divided by Assets – Suppliers –Teller. EBIT is the acronym of Earnings Before Interest and Taxes, known in Brazil as LAJIR, or *Lucro Antes dos Juros e Tributos*. The *F test* (Table 2), where the portfolios presented variance equal to 5% significance level. The CSI portfolio had an average return on investment lower than the other portfolios, but they are statistically equal to 5% of significance (H_0). In addition, analyzing the CSI and IBrX-50 portfolios, excluding joint ventures and applying the *T test*, they continue to have average statistically equal to 5% of significance (H_0).

The return on equity (ROE) is calculated from the net income divided by shareholders' equity (LL/PL). In Table 2, the statistical summary for the return on equity shows through the *F test* that all portfolios have the same variance at 5% of significance. The CSI portfolio has a lower return compared with other portfolios, but all of them have statistically equal average at 5% of significance (H_0). Analyzing the CSI and IBrX-50 portfolios, excluding joint ventures and applying the *T test*, they continue to have average statistically equal to 5% of significance (H_0).

The current ratio (CR) is obtained by current assets (CA) divided by current liabilities (CL) and reflects the company's ability to pay in the short term. It indicates how much the company has as current assets for every $ 1 of current liabilities. In Table 2, one shows the statistical summary for CR, where the *F test* shows that the same variance for CSI and IBrX50; and different for ICO2. The CSI and ICO2 portfolios have lower liquidity, but they are on average statistically equal at 5% of significance (H_0). Analyzing the CSI and IBrX-50 portfolios, excluding joint ventures and applying the *T test*, they continue to have average statistically equal to 5% of significance (H_0).

The total gross debt divided by shareholders' equity is a way to assess the debt of a company. The statistical summary for the debt, where the *F test* shows the same variance for ICO2 and IBrX-50; and different for CSI. The CSI portfolio has a lower and higher ICO2 debt, but they are on average statistically equal at 5% of significance (H_0). In addition, analyzing the CSI and IBrX-50 portfolios, excluding joint ventures and applying the T test, they continue to have average statistically equal at 5% of significance (H_0).

5 CONCLUSION

Sustainability is something more and more present in organizations and considering that this variable becomes part of the investor's profile. Therefore, organizations are incorporating the new paradigm of corporate sustainability. In companies with shares traded on the BM&FBovespa, that environmental concern is represented with voluntary entry in the indices of corporate sustainability and in efficient carbon.

Given the main objective of determining whether the main fundamentalist indicators present average differences, through *T Test*, on the CSI , IBrX-50 and ICO2 portfolios, it cannot be said that sustainable portfolios have an average performance different than the conventional portfolio. The differences found were in the share price divided by earnings (P/E) considering all actions and also excluding the ordinary ones (H_1). Some difference was also seen in the share price divided by book value per share (P/BV), excluding the common shares. In other fundamentalist indicators, they presented equal average (H_0) with 5% of significance. Thus, companies with sustainable practices do not differ significantly from other companies in the period. The *F* and *T tests* were applied, excluding the shares/joint ventures in both the CSI and IBrX-50 portfolios, but which had similar results.

Finally, studies such as Rezende, Nunes and Portela (2008), Cavalcante, Bruni and Costa (2009) and Machado, Machado and Corrar (2009) demonstrated by statistical tests that the average return of the CSI is similar portfolio to the other portfolios, although it is a differentiated portfolio. Further studies with fundamentalist indicators are suggested to increasing the number of portfolios, for example IBrX-100 or IbrA. Another option is the analysis by segment, considering historically more polluting sectors that form it and not the CSI portfolio. In addition, if the selection criteria of the CSI and ICO2 portfolios had a more quantitative approach, it would allow comparative studies of environmental indicators.

REFERENCES

ACTION. (2014). *Software estatístico.* Retrieved August, 2014, from http://www.portalaction.com.br.

Andrade, L. P., Bressan, A. A., Iquiapaza, R. A., & Melo Moreira, B. C. de. (2013). Determinantes de adesão ao Índice de Sustentabilidade Empresarial da BM&FBOVESPA e sua relação com o valor da empresa. *Revista Brasileira de Finanças*, *11*(2), 181-213.

BM&FBOVESPA. (2014). *Índices: indicadores de desempenho de ações 2014.* Retrieved August, 2014, from http://www.bmfbovespa.com.br/indices.

Brasil. Presidência da República, Câmara de Políticas dos Recursos Naturais, Comissão de Políticas de Desenvolvimento Sustentável e da Agenda 21 Nacional [CPDS]. (2000). *Agenda 21 Brasileira: bases para a discussão.* Brasília.

Brundtland, G. H. (1987). *Our Common Future: World Commission on Environment and Development* (Vol. 383). Oxford: Oxford University Press.

Caixa Econômica Federal. *Sistema on-line: disponibiliza informações financeiras para o investidor 2014*. Retrieved August, 2014, from http://web3.ondeinvestir.com.br.

Cavalcante, L. R. M. T., Bruni, A. L., & Costa, F. J. M. (2009). Sustentabilidade empresarial e valor das ações: uma análise na bolsa de valores de São Paulo. *Revista de Gestão Social e Ambiental*, *3*(1), 70-86.

Figueiredo, G. N., Abreu, R. L., & Las Casas, A. L. (2009). Reflexos do índice de sustentabIlIdade empresarIal (ISE) na Imagem das empresas: uma análIse do consumIdor consciente e do marketing ambiental. *Pensamento & Realidade. Revista do Programa de Estudos Pós-Graduados em Administração - FEA. 24*(1), 107-128.

Fundamentus. (2014). *Sistema on-line: disponibiliza informações financeiras e fundamentalistas das empresas com ações listadas na Bovespa.* Retrieved August, 2014, from http://www.fundamentus.com.

Gil, A. C. (2010). *Como elaborar projetos de pesquisa*. 5. ed. São Paulo: Atlas.

Lameira, V. J., Ness Jr, W. L., Quelhas, O. L. G., & Pereira, R. G. (2013). Sustainability, value, performance and risk in the Brazilian capital markets. *Review of Business Management*, *15*(46), 76-90.

Machado, M. A. V., MACEDO, M. A. D. S., Machado, M. R., & Siqueira, J. R. M. (2012). Análise da relação entre investimentos socioambientais e a inclusão de empresas no índice de sustentabilidade empresarial (ISE) da BM&FBovespa. *Revista de Ciências da Administração*, *14*(32), 141-156.

Machado, M. R., Machado, M. A. V., & Corrar, L. J. (2009). Desempenho do Índice de Sustentabilidade Empresarial (ISE) da bolsa de valores de São Paulo. *Revista Universo Contábil*, *5*(2), 24-38.

Marconi, M. A., Lakatos, E. M. (2010). *Fundamentos de metodologia científica.* **(**7a. ed). São Paulo: Atlas.

Matarazzo, D. C. (2010). *Análise financeira de balanços: abordagem gerencial.* **(**7a. ed).. São Paulo: Atlas.

Miura, M. N., Castro Júnior, D. F. L. de, Martins, E. S., Lima, N. C., & Souza, G. H. S. de. (2013). The Global Crisis and its impact on the index performance of BM&FBOVESPA. *Asian Journal of Business and Management Sciences*, 2(12), 1-12.

Nunes, J. G., Teixeira, A. J. C., Nossa, V., & Galdi, F. C. (2010). Análise das variáveis que influenciam a adesão das empresas ao índice BM&Fbovespa de Sustentabilidade Empresarial. *BASE - Revista de Administração e Contabilidade da Unisinos*, 7(4), 328-340.

Oliveira, A. F. de, Machado, D. G., & Beuren, I. M. (2012). Evidenciação ambiental de empresas de setores potencialmente poluidores listadas no índice de sustentabilidade empresarial (ISE). *Revista de Gestão Social e Ambiental*, *6*(1), 20-37.

Rezende, I. A. C., Nunes, J. G., & Portela, S. S. (2008). Um estudo sobre o desempenho financeiro do Índice BOVESPA de Sustentabilidade Empresarial. *Revista de Educação e Pesquisa em Contabilidade (REPeC)*, *2*(1), 93-122.

Rojo, C. A. (2014). *Investimento em ações Small Caps: Cenários do mercado brasileiro*. **(**1a. ed).. Cascavel: Assoeste.

Sousa, C. B. de, Silva, A. F. da, Ribeiro, M. S., & Weffort, E. F. J. (2014). Valor de mercado e disclosure voluntário: estudo empírico em companhias listadas na BM&FBovespa. Revista Ambiente Contábil – UFRS, *6*(2), 94-115.

Tomaselli, T. R. (2010). A ACP e a tomada de decisão em investimentos. *Fractal: Revista de Psicologia*, *22*(3), 525-542.

ISSN: 2047 - 0398
SPECIAL ISSUE – V|4|N|7| February |

Table 1 – Basic statistical summary for the variables: share price divided by earnings per share (P/E); share price divided by book value per share (P/BV); Dividend yield; asset turnover; earnings per share (EPS). Prices in Reais (R$).

Statistics	P/E			P/BV			*Dividend yield*			Asset turnover			EPS		
Portfolios	CSI	IBrX-50	ICO2	CSI	IBrX-50	ICO2	CSI	IBrX-50	ICO2	CSI	IBrX-50	ICO2	CSI	IBrX-50	ICO2
n	51	49	31	51	49	31	51	49	31	34	39	24	39	45	29
Minimum	-19.70	-7.95	5.28	0.15	0.39	0.42	0.000	0.000	0.000	0.11	-0.73	-0.73	-4.09	-0.17	0.13
1st Quartile	7.38	11.51	11.38	0.83	0.92	1.08	0.0300	0.0145	0.0150	0.39	0.30	0.27	0.69	0.50	0.51
Average	15.26 **a**	29.19 **b**	29.11 **b**	2.33 **a**	3.28 **a**	3.64 **a**	0.054 **a**	0.045 **ab**	0.037 **b**	0.54 **a**	0.63 **a**	0.71 **a**	1.34 **a**	1.44 **a**	1.63 **a**
Median	11.14	19.89	19.23	1.25	1.5	1.67	0.042	0.032	0.032	0.52	0.44	0.58	1.13	1.16	1.19
3rd Quartile	21.43	29.1	30.53	2.01	4.125	3.32	0.077	0.046	0.046	0.69	0.85	1.01	1.91	1.90	2.33
Maximum	74.63	227.27	161.93	19.67	19.67	19.67	0.159	0.448	0.137	1.10	3.66	3.66	4.94	4.94	4.94
SD	15.66	39.62	32.45	3.63	4.31	4.98	0.039	0.066	0.029	0.23	0.66	0.81	1.71	1.22	1.38
Variance	245.36 **A**	1 569.97 **B**	1 053.46 **B**	13.18 **A**	18.59 **A**	24.79 **B**	0.0015 **A**	0.0044 **B**	0.0008 **A**	0.05 **A**	0.44 **B**	0.65 **B**	2.92 **A**	1.49 **B**	1.89 **AB**
CV (%)	102.59	135.74	111.48	156.03	131.60	137.08	71.670	147.620	77.630	7.35	16.84	23.07	20.39	12.73	15.68
LL (Average)	10.86	17.81	17.20	1.30	2.04	1.81	0.043	0.026	0.026	0.46	0.42	0.37	0.79	1.07	1.11
UL (Average)	19.67	40.57	41.01	3.34	4.52	5.46	0.065	0.064	0.047	0.62	0.84	1.06	1.89	1.81	2.15
Asymmetry	1.70	3.39	2.55	3.68	2.38	2.18	1.166	4.692	1.461	0.34	2.35	1.82	-0.82	1.19	1.00
Kurtosis	4.37	12.58	6.90	13.72	5.30	3.59	0.688	25.430	2.687	-0.47	9.03	5.01	2.40	1.01	-0.05
Amplitude	94.33	235.22	156.65	19.52	19.28	19.25	0.159	0.448	0.137	0.99	4.39	4.39	9.03	5.11	4.81

Source: research data (2014). N: number of data; SD: standard deviation; CV: coefficient of variation; LL: lower limit of the range of 95% confidence; UL: upper limit of the range of 95% confidence. Capitalized letters in lines mean statistically equal mean 5% of significance level. Capital letters in the same lines mean statistically equal variances at 5% of significance level.

ISSN: 2047 - 0398
SPECIAL ISSUE – V|4|N|7| February |

Table 2 – Statistical Summary for the variables: book value per share (VPS); return on invested capital (ROIC); return on equity (ROE); current ratio (CR); gross debt divided by book equity (D/BE). Prices in Reais (R$).

Statistics	VPS			ROIC			ROE			CR			D/BE		
Portfolios	CSI	IBrX-50	ICO2	CSI	IBrX-50	ICO2	CSI	IBrX-50	ICO2	CSI	IBrX-50	ICO2	CSI	IBrX-50	ICO2
n	39	44	29	34	39	24	39	44	29	34	39	24	34	39	24
Minimum	2.16	0.96	0.96	-0.101	0.001	0.001	-0.26	-0.05	0.01	0.62	0.62	0.62	0.08	0.02	0.07
1st Quartile	6.67	5.95	5.98	0.0530	0.0540	0.0555	0.05	0.04	0.05	1.12	1.36	1.14	0.56	0.43	0.47
Average	15.55 **a**	13.12 **a**	14.20 **a**	0.12 **a**	0.14 **a**	0.15 **a**	0.15 **a**	0.17 **a**	0.19 **a**	1.69 **a**	1.91 **a**	1.63 **a**	1.02 **a**	1.12 **a**	1.26 **a**
Median	10.45	10.29	11.22	0.102	0.114	0.121	0.12	0.13	0.14	1.49	1.74	1.62	0.67	0.71	0.70
3rd Quartile	20.60	18.05	22.11	0.168	0.202	0.200	0.19	0.25	0.24	2.37	2.37	2.11	1.31	1.20	1.42
Maximum	48.09	39.51	39.51	0.459	0.412	0.412	0.86	0.86	0.86	3.82	5.38	2.67	3.84	7.42	7.42
SD	12.56	9.53	10.59	0.110	0.111	0.114	0.21	0.18	0.21	0.82	0.82	0.55	0.83	1.38	1.58
Variance	157.78 **A**	90.74 **A**	112.10 **A**	0.012 **A**	0.012 **A**	0.013 **A**	0.04 **A**	0.03 **A**	0.04 **A**	0.67 **A**	0.68 **A**	0.30 **B**	0.69 **A**	1.91 **B**	2.49 **B**
CV (%)	12.94	10.94	13.84	15.550	12.420	15.140	21.61	16.62	20.49	8.30	6.92	6.87	14.02	19.76	25.63
LL (Average)	11.48	10.23	10.17	0.083	0.107	0.105	0.09	0.11	0.11	1.41	1.64	1.40	0.73	0.67	0.59
UL (Average)	19.62	16.02	18.23	0.159	0.179	0.201	0.22	0.22	0.27	1.98	2.18	1.86	1.31	1.57	1.92
Asymmetry	1.19	0.95	0.74	1.185	0.938	0.802	1.86	2.21	2.09	0.92	1.78	0.20	1.52	2.85	2.60
Kurtosis	0.46	0.23	-0.35	2.068	-0.052	-0.339	4.43	5.71	4.02	0.03	5.65	-0.88	1.99	9.17	7.09
Amplitude	45.93	38.55	38.55	0.560	0.411	0.411	1.12	0.91	0.86	3.20	4.76	2.05	3.76	7.40	7.35

Source: research data (2014). N: number of data; SD: standard deviation; CV: coefficient of variation; LL: lower limit of the range of 95% confidence; UL: upper limit of the 95% confidence interval. Capitalized letters in lines mean statistically equal mean 5% of significance level. Capital letters in the same lines mean statistically equal variances at 5% of significance level.

ISSN: 2047 - 0398
SPECIAL ISSUE – V|4|N|7| February |

Table 3 – Summary of averages, F Test and T Test for Fundamental Indicator. Prices in Reais (R$).

Index	Hypothesis testing	CSI X IBrX-50		IBrX-50 X ICO2		CSI X ICO2		CSI X IBrX-50*	
Share price divided by earnings per share (P/E)	Average Portfolio	15.26	29.19	29.19	29.11	15.26	29,11	10,45	34,47
	F Test - Two Variances (p-value)	0.0000		0.2472		0.0000		0.0000	
	T Test - Independent samples (p-value)	0.0252		0.9928		0.0321		0.0176	
Share price divided by book value per share (P/BV)	Average Portfolio	2.33	3.28	3.28	3.64	2.33	3,64	1,60	3,20
	F Test - Two Variances (p-value)	0.2306		0.3673		0.0472		0.0000	
	T Test - Independent samples (p-value)	0.2356		0.7361		0.2104		0.0258	
Dividend yield	Average Portfolio	0.054	0.045	0.045	0.037	0,054	0,037	0,062	0,046
	F Test - Two Variances (p-value)	0.0003		0.0000		0.0734		0.0005	
	T Test - Independent samples (p-value)	0.3938		0.4544		0.0331		0.3777	
Asset Turnover	Average Portfolio	0.54	0.63	0.63	0.71	0,54	0,71	0,55	0,69
	F Test - Two Variances (p-value)	0.0000		0.2742		0.0000		0.0000	
	T Test - Independent samples (p-value)	0.4477		0.6541		0.3228		0.4089	
Earning per share (EPS)	Average Portfolio	1.34	1.44	1.44	1.63	1,34	1,63	1,31	1,30
	F Test - Two Variances (p-value)	0.0333		0.4667		0.2371		0.0080	
	T Test - Independent samples (p-value)	0.7563		0.5466		0.4577		0.9856	
Book value per share (VPS)	Average Portfolio	15.55	13.12	13.12	14.20	15,55	14,20	16,75	12,29
	F Test - Two Variances (p-value)	0.0799		0.5226		0.3499		0.0305	
	T Test - Independent samples (p-value)	0.3209		0.6518		0.6416		0.1756	
Return on invested capital (ROIC)	Average Portfolio	0.12	0.14	0.14	0.15	0,12	0,15	0,11	0,15
	F Test - Two Variances (p-value)	0.9411		0.8779		0.8305		0.6384	
	T Test - Independent samples (p-value)	0.3914		0.7285		0.2784		0.2165	
Return on equity (ROE)	Average Portfolio	0.15	0.17	0.17	0.19	0,15	0,19	0,11	0,14
	F Test - Two Variances (p-value)	0.4631		0.4560		0.9465		0.3708	
	T Test - Independent samples (p-value)	0.7464		0.6394		0.4844		0.4559	
Current Ratio (CR)	Average Portfolio	1.69	1.91	1.91	1.63	1,69	1,63	1,65	2,02
	F Test - Two Variances (p-value)	0.9721		0.0409		0.0481		0.9436	
	T Test - Independent samples (p-value)	0.2673		0.1098		0.7175		0.1502	
Gross debt divided by book equity (D/BE).	Average Portfolio	1.02	1.12	1.12	1.26	1,02	1,26	0,90	1,07
	F Test - Two Variances (p-value)	0.0039		0.4616		0.0009		0.0001	
	T Test - Independent samples (p-value)	0.7009		0.7212		0.5052		0.6109	

Source: research data (2014). Significance level for T Test and F Test of 95%. * Comparison between CSI and IBrX50 disregarding the companies in both the portfolios.