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Does the ranking of corporations based on social and environmental reporting give a comfort to investors with regards to the odds of bankruptcy of a company without impacting their medium term financial performance?

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ABSTRACT

This paper will study the link between Corporate's financial performance and their sustainability strategies. The assumption is that the companies which have integrated CSR principles into their business development did not do so at the expense of their shareholders' basic expectations.

To check our assumption we will use distress assessment indicators as well as some financial performance and equity market behaviour ratios.

We will create 2 groups: High and Low deciles of companies ranked by social and environmental performances as per the methodology defined by Csrhub.com.

The study will review the ranking and financial ratio figures of more than 1,500 companies (out of more than 7,000 included in the Csrhub.com database). These companies are split into 132 sub-industry groups in the Csrhub.com database.

The objective is to measure whether a company that includes CSR strategies in its corporate strategy offers a sounder financial balance sheet and can count on a more stable shareholder base than the ones mainly focusing on short term returns, yet without jeopardizing the shareholders' expected returns.

1 Introduction

The main objective of this paper is to compare corporate balance sheets and accounting results together with environmental and social performances as determined by a single CSR ranking database. To achieve this task we will use 2 main sources of information: Csrhub.com for the «people and planet» related data and Bloomberg terminal for the «profits» universe and market related financial information.

2 What are we trying to achieve here, using which tools and how?

The aim of this paper is to demonstrate that there is a correlation between the CSR based ranking of companies and their sustainability capacity within the same sub-industry group. We would like to check whether the highest CSR ranked companies have a lower chance of going bankrupt because their CSR focus should allow them to have a more long term oriented business strategy, thus allowing them to be able to adapt more easily to the ever changing business environment. We would also like to demonstrate that this long term oriented business strategy is not jeopardizing their medium term (5 years) return on equity.

To check these assumptions we will use 2 distress assessment indicators:

- a. the Bloomberg Credit default risk (DRSK) a proprietary hybrid methodology developed by Bloomberg which is based on the Merton distance to default model.
- b. the Altman Z-score analytical representation (Alt-Z), a formula developed in 1968 by Edward L. Altman for predicting company's bankruptcy.

One of the key differences between the Altman Z-score (Alt-Z) and the Bloomberg Credit default risk model inspired by the Merton approach is that the Merton based model -thanks to its option valuation roots-, introduced the notion of volatility in the asset valuation "along with additional economically and statistically relevant factors" (Rajan Singenellore, Yong Lee, Yufei Li, William Mann and Anurag Rajat (2012)¹ , Thus, when "the firm's asset

¹ Singenellore, Lee, Li, Mann and Rajat (2012). *Credit Default Risk Framework, Methodology & Usage* : Bloomberg, New York.

volatility increases, its probability of default increases while the expected recovery rate in the event of default at default decreases” *again* Altman, Resti and Sironi (2001 p10)²

Meanwhile, the Alt-Z only uses in its formula 6 out of 7 “static” basic accounting measures abstracted from the latest financials report published by the company and a less static one which is the Market value of equity.

In our view, volatility is a crucial element to include in the asset valuation assessment when trying to detect evidence of CSR in companies' balance sheets. Indeed the observation of the endogenous volatility of a corporate's cash flows is clearly an element that we need to take into consideration when trying to assess whether a company has actually implemented in its operations the CSR principles. To be more susceptible to avoid scandals related to human rights breach or environment disasters that would have destabilizing consequences on its balance sheet as well as to its reputation, a company would need to be continuously interacting with its stakeholders thus taking into consideration in its business development not only the current business condition but also the future impact and consequences of its operations.

We also would like to demonstrate that another main characteristic of the companies that involve social and environmental considerations in their business development strategy should be their ability to attract further long term sensitive investors (such as pension funds, business partners or company insider shareholders) rather than the short term speculators such as hedge funds and daily traders.

Exhibiting this last point is certainly the most difficult part to achieve as the bold trend for equity holding duration tends toward an incredible reduction in the average holding period, from 8 years during the 60' in United Kingdom as well as in the United States to only few days in 2013.

However we will try to identify a counter macro trend tendency by focusing on 2 equity market financial ratios:

- c. the Beta minus measurement which could be defined as the resistance of the shareholders towards the equity share price moves during correction phases.

² Altman, Resti and Sironi, (2001). *Analyzing and Explaining Default Recovery Rates: The International Swaps & Derivatives Association, New-York.*

d. the 1 year equity price volatility which tracks the daily equity price variation and translates the investor's response to the company specific or broad economic news flow.

These two indicators should also allow us to discover whether the highest CSR ranked companies' shareholders tend to be less nervous than the lowest ranked companies' shareholders. In other words are they more confident when investing with a company which has a clear longer term focus and is also proactively taking measures in order to avoid being kicked out of business by unexpected events.

2.1 Corpus; how has the sample of companies been selected

In order to exhibit the performance's divergence between the CSR champions and the CSR laggards within the same sub-industries, we have in this work analysed the 10% highest and 10% lowest ranked companies for each sub-industries. We will thus cover around 20% of the total database members³.

Some of the companies that are in the Csrhub.com database are privately held thus we could not obtain the financial data needed to perform our comparison; therefore we had to exclude them from this research. We also didn't get all needed data for some of the publicly traded companies, especially from developing countries and thus also had to exclude them from this study. Regarding the sub-industries which have less than 30 members we took the 3 best and worst companies. We excluded some sub-industries which have less than 10 members and on which we could not get enough financial and sustainability data and for which the results may therefore have been inaccurate. We have also excluded a sub-industry, the "Electronic Shopping and mail-order houses" which include a motley group of companies with apparently little in common. We hardly see what these companies businesses have in common and how they are related to the sub-industry mentioned herein so we did not at all upload any data for the members of this group.

2.2 Brief literature review

Scholars have analysed the stock market and accounting performance of 180 US registered companies over an 18 year period, split into 29 sectors and into 2 groups,

³ Some corporates are members of more than 1 sub-industry. We didn't exclude them from any of the sub-industries this explains why they appear more than once in our tables

termed as high and low sustainability (Eccles, Ioannou & Serafeim, 2011)⁴. Their research provided evidence that high sustainability companies significantly outperform their counterparts over the long term⁵

Their research focused on U.S. registered corporates and on accounting performance such as the return on equity and the return on assets. Our study does not follow the companies' performance over such a long period of time. However we will firstly enlarge the corpus to the global corporate universe. By doing this, we will, unlike the corpus of the Harvard business school lose some common shared characteristics of our corporates sample. For instance, the numbers of years since the "High CSR" companies have adopted corporate sustainability policies or the matching between the High and Low' CSR group in terms of the size of the total assets as well as to the correlation of some others financials ratios (ROA, ROE, Leverage etc.). Nevertheless this is the condition to enable us to spread our study at the Global corporate's level and thus winning in diversity what we are losing in accuracy. Secondly we are going to introduce the notion of default risk in the groups' comparison thus not only taking into consideration past events but the probability of future major ones.

Finally our approach will also add some elements related to the "quality" of the corporates equity performance through the observation of both the equity volatility and the beta minus measurements.

Regarding the impact of sustainability strategies on the survival expectancy rate of companies D. diBartolomeo of Northfield Research (2010) used an extended Merton's model approach derived from the "First passage model" (Black and Cox 1976)² and enhanced by the observation of the corporates asset volatility together with correlation estimates, thus diBartolomeo (2010) is proposing the following method for measuring sustainability of a firm : "With asset volatility and correlations estimated we can use our preferred structural model to estimate the default probability of a firm. We can use the method from Zhou to convert asset correlations to default correlations, allowing us to produce joint default probabilities across firms" (D. diBartolomeo, 2010⁶). This approach was used to examine the scoring difference between companies taken from the

⁴ Eccles, Ioannou & Serafeim, 2011. The Impact of Corporate Sustainability on Organizational Processes and Performance : *Harvard Business School, Working paper No 12-035*

⁵ Fischer Black, John C. Cox, 1976. Valuing Corporate securities: some effects of bond indenture provisions: *The Journal of Finance* vol 31, The American Finance Association

⁶ Dan diBartolomeo, 2010. *Equity Risk, Credit Risk, Default Correlation and Corporate Sustainability*, Northfield Research , Boston , pp 1- 3

“FTSE/KLD DSI 400 stock index of US large cap firms” for the sustainable companies’ basket and from the “S&P 500” for the others. They showed that “ the concept of corporate “sustainability” as broadly used by socially responsible investors appears to be supported, with purportedly sustainable firms having average expected lives which are longer than those of non-sustainable firms to a] statistically significant degree” (diBartolomeo, 2010)³.

In our paper we will compare 2 different distress assessment methodologies and check whether one is validating or contradicting the other. Our approach will also be different in the sense that our results will be consolidated at the sub-industries level and the sample of companies used will not focus on one single country. Our choice of using 2 different generations of distress assessment models may also exhibit that poor CSR focused companies might provide appealing accounting ratios in their balance sheets but encounter greater difficulties in controlling the outcome of third generation models that include exogenous factors.

2.2.1 Why is the Financial Sector excluded from this paper?

We have excluded the financial sector from the corpus of this paper for various reasons. The major reason being that the Altman Z-score was originally designed to analyse the “manufacturing” sector. Thus the source of our data, Bloomberg, is not providing any rating for finance companies for this specific model. Furthermore, the literacy about the misinterpretation of this ratio when applied to the financial sector companies balance sheets abound: “*The Altman models are generally not recommended for financial companies...because of the opacity of financial companies' financial statements and their frequent off-balance sheet items*”⁷.

Other studies, analyzing CSR impact on corporates performances, that were not using a incompatible ratio with this industry have also put aside the financial corporates from their research arguing for instance that they “*eliminate 100 financials institutions, such as banks, insurance companies, and finance firms, because their business model is fundamentally different and many of the environmental and social policies are not likely to be applicable or material to them*” (Eccles, Ioannou and Serafeim, 2011)⁸

⁷ Stockopedia, 2010. The Altman Z-Score: Is it possible to predict corporate bankruptcy using a formula? [Online] Available at: <http://www.stockopedia.co.uk/content/the-altman-z-score-is-it-possible-to-predict-corporate-bankruptcy-using-a-formula-55725/> [Accessed July 2013]

⁸ Eccles, Ioannou & Serafeim, (2011). The Impact of Corporate Sustainability on Organizational Processes and Performance: *Harvard Business School, Working paper No 12-035, p9.*

3 Why did we choose Csrhub.com for the CSR data?

We were looking for a database which embraces some CSR principles and particularly that the knowledge should be available to the largest number of people. Also, as mentioned in point 2.2 we needed to find a CSR reporting database that was global and thus that include a lot of various sources to better reflect the various methodological and cultural approach to CSR that one can find in the different parts of the world.

3.1 CSR databases, who are the main players

There are several organizations which have set up ranking methodologies to assess whether a company has a high CSR culture or whether it has a poor one. The pioneers and most well known database such as Asset4 (Thomson-Reuters), Domini (Morgan Stanley Capital International (MSCI), Sustainable Asset Management (Robecco) have now been acquired by major financial firms such as information providers or funds managers and are generally expensive. The registration to these databases is mainly aimed at professional financial users which can afford the subscription costs as they use the data in order to invest large amount of money on which they are charging comfortable management fees.

3.1.1 Csrhub.com

CSRHUB.COM is a United States B certified Corporation and is providing freely, after registration, a rating on more than 7,300 worldwide companies and organizations, classified by region or industry. Unlike its ancestors Csrhub.com applies the "characteristics" of the information technology age - a straight and easy access for all in order to summarized information - and therefore their database is easily available on the Internet and the classical CSR report with hundreds of pages has been replaced by single numbers that allow a quick summary of the organizations CSR performances.

Furthermore, the methodology used by CSRHUB.COM is holistically oriented in the sense that their aim is to integrate in their database as much as social and ecological sustainability sources as possible. Their data *"comes from eight ESG (environment, social, governance) analysts, well-known indexes, publications, "best of" or "worst of" lists,*

NGOs, crowd sources and government agencies”⁹ from a total of more than 200 various sources. As mentioned here above, all this type information is converted into figures and then summarized in only 1 number ranging from 0 to 100 (100 being the highest score) and this for each of “*their 12 sub-categories rating levels then rolled up to the 4 category levels*”¹⁰, which are: Community, Employees, Environment, Governance as well as for an Overall category level which is an average of the 12 sub-categories.

In this paper we will only focus on the Overall rating figures. However it would be interesting in future works to perform further research using the sub-categories ratings. Indeed, the Overall rating has no proper definition and its level could be the result of very different situations. A company could be very efficient in 1 of the 4 Csrhub.com category and very poor in the others segments and presenting an above average results while another company embracing sustainability in a more holistic way could get a lower Overall rating. Unfortunately the time granted to the achievement of this paper is too short to enable us to analyse the ratings of each sub-categories.

The limit of the Csrhub.com approach is well described by Bahar Gidwani the founder of the website who wrote that “our goal is to provide the best available estimate of how a company’s sustainability performance is viewed by those who rate and measure it. So, if all of those who track a company are fooled into thinking it is good (when it is not), our score will be high (even though it should not be)”¹⁰.

3.1.2 Csrhub.com methodology

The methodology of CSRHUB.COM is very similar to the one used in financial ratio databases. Unlike the Global Reporting Initiative (GRI) approach which tends to promote personalized indicators for each sector and even each individual company the CSRHUB.COM approach has the advantage of integrating the widest sources of information available on each company and summarizing all this data in sub-categorized figures. As this paper aim is basically to try to find common ground between CSR and financial metrics this method is meaningful when trying to compare companies between

⁹ CSRHUB, 2011. *Frequently Asked Questions About CSR*. [Online] Available at: <http://www.csrhub.com/content/frequently-asked-questions-about-csr> [Accessed June 2013]

¹⁰ CSRHUB, 2011, *CSRHUB Scores: How Accurate Are Our Ratings?* [Online] Available at: <http://www.Csrhub.com/blog/2011/09/Csrhub.com-scores-how-accurate-are-our-ratings.html> [Accessed June 2013]

each other on the widest scale as possible. The ratio and metrics used by the financial analysts such as Price Earnings ratio (PE) Return on Equity (ROE), Earnings before Interest, Taxes, Depreciation, and Amortization (EBITDA), are basically the same for all type of industries. Only expected ranges or gearing of those financial ratio are subject to industry adjustments. Thus the CSRHUB.COM approach is in our view the best existing one to achieve our research by sub-industries.

When looking at the rankings of some well-known CSR champions we swiftly get the confirmation that the CSRHUB.COM methodology is in line with what the academic studies have shown so far, i.e. that European, United States and South African companies sustainability ranking performance are more often at the top than at the bottom of the industries classification than their Asian peers. In terms of CSR champions, well-known Companies for their CSR long term involvement are getting the highest ratings compared to their industry average. For instances : Norsk Hydro (72 vs 51 for the Mining ex Oil and Gas), Eastman Kodak (74 vs 51 for the audio & video Equipment manufacturing), Southwest Airlines (59 vs 54 for the Passenger Airlines), British American Tobacco (61 vs 51 for the tobacco industry) while companies well known for their short term focus and poor ecological and societal strategies like Halliburton (49 vs 51 for the Energy equipment and Services), CNOOC (44 vs 50 for the oil and gas extraction industry) , Lorillard (38 vs 51 for the tobacco industry), Foxconn Technology (40 vs 48 for the hardware manufacturing) etc., have poor results.

3.2 Overview of the Csrhub.com industry classification

Csrhub.com has its own industry classification based on the North American Industry Classification System (NAICS) to which they added some proprietary categories. In total there are 18 major categories such as Distribution, Durable Goods, Retails etc. and 135 sub-industries groups such as Wholesale trade, Hardware Manufacturing, Speciality Retail etc. Our work is focusing on the 135 sub-industries level. Thus we are going to obtain a large panel of results with a high degree of accuracy that will actually compare companies which have the same type of economic activity in various countries.

3.3 The CSRHUB.COM profile tool and special issues

CSRHUB.COM, proposes a proprietary tool that allow the users to personalize the Overall rating for each rated organization. This Tool is aimed at allowing users to emphasize their preferences in terms of community, employees, environment and governance as well as in terms of “special issues” such as “animal test user”, coal involvement, military contractor etc.¹¹ In our work we have given an equal weight to all these parameters thus having a neutral approach to the Overall rating result.

3.4 Explaining why the overall company average is close to 50 in the Csrhub.com database?

The Overall average rating for all the companies that are covered by Csrhub.com is close to 50. *“This is consistent with the idea that there is a “norm” for each of the twelve subcategories that we measure. Companies that meet this norm should score around a 50”¹²*

“The graph 1 below shows the distribution for the average profile for the CSRHUB.COM community. You can see that the peak in the overall ratings is at around 50 (actually at 49); the minimum score is 15, and the maximum score is 74”¹³.

4 Description of the financial ratios used in this research and reasons why we chose them

In this paper we are going to focus on 3 different types of financial information: the first one aimed at scoring the quality of the balance sheet of the companies, the second one aimed at checking their accounting performances, and the last one aimed at assessing the “comfort” shareholders could expect from the company’s equity market fluctuations.

¹¹ For a comprehensive list please refer to the following link, CSRHUB, 2011. *More about special issues* [Online] Available at <http://www.Csrhub.com/content/more-about-special-issues> [Accessed June 2013]

¹² CSRHUB, 2011, *CSRHUB Scores: How Accurate Are Our Ratings?* [Online] Available at: <http://www.Csrhub.com/blog/2011/09/Csrhub.com-scores-how-accurate-are-our-ratings.html> [Accessed June 2013]

¹³ CSRHUB, 2011. *CSRHUB Scores: Does a Difference Matter?* [Online] Available at: <http://www.Csrhub.com/blog/2011/09/Csrhub.com-scores-does-a-difference-matter.html> [Accessed July 2013]

4.1 The Altman Z-score (ALT-Z) and the Bloomberg credit default risk function (DRSK)

The Altman Z-score (Alt-Z) and the Bloomberg credit default risk function which is based on the Merton distance-to-default measure (DRSK) are 2 financial distress prognostic models. The Alt-Z is broadly used in the real world “by auditors, management consultants, and courts of law” (Gregory J. Eidleman 1995)¹⁵, to assess a company’s current financial condition. The benefit of using this kind of indicator instead of performing expensive recurrent financial audits are quite obvious. According to same text of Eidleman (1995)¹⁴ the main advantages are that “they are more precise and lead to clearer conclusions than a mass of contradictory ratios” and “their reliability can be evaluated statistically”. “They are based on past experience rather than merely on someone’s unverified opinion” says Eidleman. As per their limitation the quality of the database used and the confirmation of their results by others ratios are the key factors. As per the reliability of these models, the original study published by E.I.Altman that focuses on a sample of 66 companies of which half went bankrupt from 1946 to 1965, shows that the accuracy rate of predicting those who went bankrupt was 95% (Edward I. Altman 1968)¹⁶. Additional subsequent testing done by Altman between 1965 and 1999 on more than 300 companies returned the same kind of distress predicting accuracy of between 82 to 94% (Edward I. Altman 2000)¹⁵. Regarding the DRSK, the Merton’s distance to default model developed by Bloomberg in 2012, the accuracy rate of their model is above 90%. They also compared their model to the level of Credit Default Swap (CDS) - which are distress assessment instruments traded over-the-counter (OTC) by financial firms and “sophisticated investors” - and they found that there was a “75% rank correlation with the actual spreads” that suggest “a strong relationship between DRSK model and market spreads” (Rajan Singenellore, Yong Lee, Yufei Li, William Mann and Anurag Rajat, 2012)¹⁶.

We will then use these models to assess the sustainability through the balance sheets of the analysed companies. Indeed, the income related ratios, like the Return on Equity (ROE), weakest point is that companies could use debts to increase their balance sheet

¹⁴ Gregory J. Eidleman, 1995. *Z scores - a guide to failure prediction*. *The CPA Journal online*. [Online] Available at: <http://www.nysscpa.org/cpajournal/old/16641866.htm> [Accessed in Jul 2013].

¹⁵ E. Altman, 2000. Predicting financial distress of companies: revisiting the Z-score and Zeta® models, p18

¹⁶ Bloomberg LLP, 2010. *The Best Way to Measure Company Performance* [Online] Available at: <http://www.bloomberg.com/news/2010-03-04/the-best-way-to-measure-company-performance.html> [Accessed in Jun 2013]

leverage in order to artificially maintain a revered ROE level. These 2 models would indicate to us whether the companies balance sheets are sound based on their financial statements but also with regards to the equity and debt markets measures specifically for the DRSK model which is a more reactive and complete model than the Altman's model as described here above.

4.2 The 5 years average return on equity (ROE)

Among the financial return performance metric the most widely used is the 5 years average return on equity (ROE) which measures the net profit after taxes as a percentage of the Stockholder equity thus providing a quick view of the company's profitability toward its shareholders equity value during the last 20 financial quarters.

4.3 The 200 days average equity volatility (200d vol) and the 2 years Beta minus ratio

These two equity market behaviour ratios should give us an idea of how comfortable being a shareholder of a company is or is not. The 200 days average equity volatility (200d vol) should indicate how nervous the investors that are holding the share in their portfolios are. As to the beta minus ratio -which compares the performance volatility of an equity to its benchmark during market corrections - it should indicate whether the shareholders of a company have a long term attachment to their investment and whether they are taking advantage of market corrections to accumulate shares instead of selling them at a faster pace than their peers (in the benchmark). This last assumption is based on the belief that the broad market movement are often influencing the short term performance of a single stock and thus not only the direct news flow related to a company could explain its shares behaviour.

The below quotation extracted from a study about behavioural finance focusing on downside, highlights the relation between beta volatility and the expected equity future returns: "our strategy for finding a premium for bearing downside risk in the cross-section is as follows. First, we directly show, at the individual stocks level, that stocks with higher downside beta have higher average returns. Second, we claim that downside beta is a

risk attribute because stocks that have high covariation with the market when the market declines exhibit high average returns over the same period” (Ang, Cheng, Xing 2004)¹⁷.

Contrarily to the theoretical approach advocated by Ang, Chen, & Xing (2004), we think that in the real world, risk managers using tools mainly based on maximum supported draw-down and value at risk assessment can't stand this kind of volatility. What would happened is that a lot of investors holding high beta minus kind of shares will sell them at the worst point in time. Actually very few would be able (or allowed) to benefit from the expected upswing. Our approach is more aimed at promoting equities which would avoid having all the risk manager's gauges in the red during market correction, thus enabling the wealth manager to be in an accumulating mood during turmoil rather than in a state of panic.

5 Why did we choose not to take into consideration the simple equity market performance of the companies?

Even though the equity market performance is included somehow in the return on equity and in the beta minus indicator, we wanted to avoid the use of the simple equity market performance for the following reasons: in our view the sole equity performance of a company is not stating many things about the quality of a company or the perception of its shareholders. Unlike the volatility and the beta minus indicators the performance of an equity only measures the performance from 1 point x in time to another point y. Choosing the starting date of the observation period is highly hazardous and studies have shown that by starting historical equity performance observations from different periods instead of from December to December show totally different results. For instance “*Statistics compiled by the Stock Trader's Almanac, in its 2000 edition, showed sensitive contrast results between the summer months (May 1 to October 31) and the winter months (November 1 to April 31) returns. The investor who placed 49 years ago, \$ 10,000 in stocks in the S & P 500 only for the winter months would have realized a gain of \$*

¹⁷ Ang, Cheng, Xing, 2004. Downside Risk. Columbia University and NBER, University of Southern California, Rice University, p4.

340.250, while the one that would have put the same \$ 10,000, but only during summer months, have received a poor benefit of \$ 11,138 for all half century". *Gosselin, 2001)¹⁸

Another reason being that a lot of studies have already been made on the positive correlation between the companies CSR and their equity market performances. For instance Weber, Mansfeld and Schirmann (2010) note that "We found that the SRI fund portfolio reached a significantly higher return than MSCI World Index"¹⁹. One can also refer directly to the monthly reports of Socially Responsible Investments funds (SRI) such as the ones of RobecoSam.²⁰

6 Brief introduction to the 2 specific ratios we have designed (mainly to simplify the outcome) based on the selected indicators introduce in chapter 3

Along the distress assessment of the companies, we also wanted to track in this paper the financials performance of our sample companies. However as exposed in 2nd chapter of this paper, when tracking the CSR impact, the standard deviation of the performance is in our view as relevant as the performance itself. That's why we initially wanted to use in this research the sharp ratio²¹ of the companies' equity performance. Unfortunately the Sharp ratio is not available in Bloomberg which is our data source, they currently only provide this ratio for the Funds²². So, instead of the Shape ratio, we have calculated a simple ratio that divided the 5 year average return on equity by the 1 year equity market volatility which we called the ROE/200d Vol. We thus have a ratio that combined a medium term financial income data with a short term volatility figures. Basically we have a tool that is tracking whether the level of income generated during these last 5 years is in line with the current investor expectations. The higher numbers being the better scoring and as per the Sharp ratio, a level below 1 means that one should expect to have more short term volatility than expected equity returns.

¹⁸ Gosselin , 2001. Les effets saisonniers de la Bourse, Finance et investissement. [Online] Available at: http://www.orientationfinance.com/accueil/Chroniques/Les_meilleures_strategies/Les_effets_saisonniers_de_la_bourse.html [Accessed in June 2013].

¹⁹ Weber, Mansfeld and Schirmann, 2010. The Financial Performance of SRI Funds between 2002 and 2009 » *University of Waterloo*, [Online] Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1630502 [Accessed in June 2013]

²⁰ RobecoSam, 2013. [Online] Available at: <http://www.robecosam.com/en/professionals/strategies-services/funds/index.jsp> [Accessed in Jun 2013]

²¹ Wikipedia, 2013. *Sharpe ratio*. [Online] (Updated 25 June 2013). Available at: http://en.wikipedia.org/wiki/Sharpe_ratio [Accessed in June 2013]

²² Without specific reason and when asking why, they emailed us that providing the Sharp ratio for the equities was currently in development.

The second ratio we have “designed” is actually an extension of the previous one. We wanted to, in one number, summarize the gist of our thesis assumption as introduced in our abstract which is: “does High CSR companies offer a sounder financial balance sheet and can count on a more stable shareholder base without jeopardizing the shareholders’ expected returns”. Thus, to translate this sentence in figures, we are simply dividing the ROE/200d Vol. by the beta minus ratio of the companies (ROE/200d Vol / Beta minus). The higher score of this ratio being the better score as the beta minus best scoring are the ones below the 1 threshold.

7 Tables and charts of results by sub-industries shown by: the DRSK (Merton), the ALT-Z, the ROE on 1Y volatility, and the ROE on 1Y volatility divided by the equity Beta Minus

The results of our research have been consolidated by sub-industries in table (1) included in the appendix in order to try to exhibit some correlation toward them. A sample of this table (1) is presented below with brief description. The overall results tend toward a positive correlation between the high sustainable companies and their financials ratios to the exception of the Altman-Z score which clearly has a higher average and median score for the low sustainable decile than for the sustainable friendly companies.

7.1 Presentation and explanation of the Sub-Industry table (1) design

Table 1: Sub industry table design

Sub-industry name	Ranking	Merton difference		Altman difference		Sub industry ROE/200d		Sub Industry Beta-minus		Sub Industry Roe		Category CSR overall rating
		Merton average	High vs Low decile	Sub Industry Altman Z average	High vs Low decile	ROE/200d VOL average	ROE/200d vol difference	Average	Beta- difference	Average	Roe/beta- difference	
Agriculture & Mining	Top 10%	0.01%		3.51		0.98		1.06		0.93		50
Agriculture & Mining	Bottom 10%	0.21%	-0.19%	4.99	-1.49	0.85	0.13	1.32	-0.27	0.64	0.28	
Cattle Ranching and Farming	Top 10%	0.15%		3.72		1.80		1.03		1.75		46
Cattle Ranching and Farming	Bottom 10%	0.02%	0.13%	8.97	-5.24	2.54	-0.75	1.19	-0.17	2.13	-0.38	
Forestry & Fishing	Top 10%	0.00%		3.18		0.36		0.75		0.48		53
Forestry & Fishing	Bottom 10%	0.09%	-0.08%	2.89	0.29	0.30	0.06	0.67	0.07	0.44	0.04	
Mining (except Oil & Gas)	Top 10%	0.26%		4.57		0.42		1.33		0.31		51
Mining (except Oil & Gas)	Bottom 10%	2.17%	-1.91%	5.24	-0.67	0.17	0.24	1.41	-0.08	0.12	0.19	
Oil and Gas Extraction	Top 10%	0.12%		2.57		0.40		1.25		0.32		50
Oil and Gas Extraction	Bottom 10%	0.69%	-0.57%	2.91	-0.34	0.43	-0.04	1.51	-0.26	0.29	0.03	
Chemicals, Plastics & Rubber	Top 10%	0.03%		3.41		0.63		1.16		0.54		51
Chemicals, Plastics & Rubber	Bottom 10%	0.03%	0.00%	4.08	-0.67	0.65	-0.01	1.13	0.03	0.57	-0.03	

The various indicators have been consolidated by sub-industries: The 3rd and 5th columns show the simple average of the score on the 2 bankruptcy indicators (Merton/Altman) obtained by the High and Low deciles companies. Column 4th and 6th exhibit the positive or negative difference between the 2 opposite deciles thereby determining whether the high or the low sustainable companies better performed on average versus the other decile. The next columns report the same exercise for the others

financials indicators. The final column indicates the overall CSR rating of each sub-industry for the overall sub-industries members (all deciles)²³.

There are 3 sub-industries on the 101 analysed in this paper for which there are not enough DRSK (Merton) data available, however as there was enough data points for the others indicators (including the Altman-Z) we decided to keep them in our corpus. Those sub-industries are the following: Industrial Conglomerates which has 36 members, Leisure equipment which has 13 members and Luxury goods & Cosmetics with 18 members. The total number of these sub-industries represents 3.95% of our corpus, enough to be kept in this paper but not enough to have changed the overall result of our research.

7.2 How to read the results

As shown in the sample table (1) presented here above, all ratios should not be read in the same direction. The better scores for the DRSK (Merton) and for the beta minus are the ones closer to 0 as highlighted in orange. As per the other ratios: the Altman Z score, ROE/200d Vol, the ROE/200d Vol / beta minus, the higher the score the better. Thus a negative difference is favourable for the “High CSR” companies for the DRSK and the beta minus only and a positive difference is in favour of the “High CSR” companies for the others indicators.

8 Analyse of the various results

The total number of companies analysed in this paper is 1,697 or 24.19% on the 7,014 companies featuring in the Csrhub.com database. We have got enough data for 101 sub-industries on the 118 sub-industries (without the 16 related to Finance and real estate) to include them in our corpus.

8.1 What are the overall result and “correlation” of the various indicators consolidated at the sub-industry level?

The table (2) below shows that to the exception of the Altman-Z score, all others indicators are predominantly validating our assumption that on average the “High CSR” ranked companies have a significantly better scoring than the “Low CSR” ones when compared at the sub-industries level. For instance, the average as well as the median scores of the

²³ The same information are available individually at the companies level in appendix 1.

DRSK (Merton's based indicator) is nearly two times better for the High CSR companies than for the other decile. Thus, without jeopardizing their 5 year average return on equity performance and without involving more volatility to the companies equity historical pricing. The "resistance" during market downside movements tested by the beta minus indicator is also slightly better for High CSR companies by about 12% (on average and in median) than the other group. Furthermore the number of sub-industries which are performing better in the above mentioned indicators (with the exception of the Altman-Z score) are significantly above the neutral level of 50%. For instance, sub-industries which have a better DRSK result for "High CSR" companies represent 68.3% of all sub-industries. When looking at the indicators which summarize the overall financial and equity performance (combining the 5 years return on equity, the 1 year market volatility and the 2 years beta minus average), we note that the proportion of the sub-industries that show a better scoring for High CSR companies reaches 81.2%. Thus when focusing only on one of the two bankruptcy indicators chosen in this research we are quite pleased with the outcome. Having only 1 distress assessment's indicator confirming our assumption is quite satisfactory but we would have been definitively more confident to have another one validating our approach. Unfortunately the Altman Z score is clearly not going this way. The "Low CSR" companies have a better Altman Z score grade by nearly 25% on average (slightly above 21% for the median) and the number of sub-industries where the "Low CSR" companies performed better than "High CSR" companies is a mirror of the "DRSK (Merton)" based indicator outcome with 33.7% for the "High CSR" and 66.3 for the other group. We will try later in chapter 9 to find a hypothesis explaining this antagonism but we will firstly start in the next chapters to dig on the consolidated result to see whether we could find some correlation between the various results consolidated at the sub-industries level.

Table 2: Table of results

TABLE OF RESULTS split by Median and Average score		101 Sub Industries 1,697 Companies		
	High Sustainable Cie	Low sustainable Cie	Difference	
"Merton" Distance to default Median	0.04%	0.08%	-0.0004	the lower the better
"Merton" Distance to default Average	0.10%	0.17%	-0.0008	the lower the better
Altman Z Median	3.54	4.41	-0.8698	the higher the better
Altman Z Average	3.62	4.42	-0.7939	the higher the better
ROE/200d Vol Median	0.68	0.37	0.3099	the higher the better
ROE/200d Vol Average	0.80	0.36	0.4352	the higher the better
Beta-minus Median	1.05	1.18	-0.1333	the lower the better
Beta-minus Average	1.04	1.17	-0.1266	the lower the better
Roe Avg / Beta minus Median	0.59	0.28	0.3079	the higher the better
Roe Avg / Beta minus Average	0.92	0.36	0.5614	the higher the better
Industry where Top decile have a better Merton result than bottom decile	68.3%	31.7%	0.3663	the higher the better
Industry where Top decile have a better Altman results than bottom decile	33.7%	66.3%	-0.3267	the higher the better
Industry where Top decile have a better ROE result than bottom decile	77.2%	22.8%	0.5446	the higher the better
Industry where Top decile have a better beta minus result than bottom decile	69.3%	30.7%	0.3861	the higher the better
Industry where Top decile have a better ROE on beta minus ratio result than bottom decile	82.2%	17.8%	0.6436	the higher the better
*As the highest figures are not necessarily the best results (merton for instance) we added some colors to signal the best or worst score		*Best score	*Worst score	

8.1.1 Which are the sub-industries that are validating our assumption?

There are 19 sub-industries or 18.81% of all sub-industries that have 2 distress assessment's indicators, 3 financials ones and the equity behavioural indicators all showing a better scoring for the "High CSR" companies than for the Low's. The total numbers (including all deciles) of companies that are members of those sub-industries amount to 1,078 or about 15% of all companies available in the Csrhub.com database. The 3 biggest sub-industries in terms of members that have the above mentioned characteristic are: The Biotechnology (106 members), the Semiconductors & other electronic component manufacturers (203 members) and the Electric & Gas utilities (212 members). Unfortunately we hardly see any common characteristic between these 3 sectors. The global CSR rating of those 19 sub-industries is at 50.26 (on the 0-100 scale

and 49 consolidated average for the overall Csrhub.com database) so there was no bias found here that we could explore (see table (3) for details).

Table 3: High decile, global assumption result

High Decile, Global assumption result			
Name of High CSR Sub-industries companies that have all 4 indicators above low CSR cies		nb of Cies in the Sub industry	Global CSR rating of the Sub-Industry
Textiles & Apparel		126	48
Grocery and Related Product Wholesalers		30	56
Lumber & Other Const. Mat'ls Wholesalers		7	46
Health Care Technology		14	48
Personal Care Products		37	51
Tobacco		18	51
Biotechnology		106	49
Nursing & Residential Care Facilities		16	48
Data & Records Management		12	53
Data Processing, Hosting & Related Services		30	50
Newspaper, Periodical, & Book Publishers		45	52
Accounting, Tax Prep., & Payroll Services		30	53
Architectural, Engineering, & Related Services		74	52
Facilities Support Services		19	57
Tech Games & Gaming		19	47
Semiconductor & Other Electronic Component Mfg.		203	47
Water Transportation		58	49
Resort & Casinos		22	44
Electric & Gas Utilities		212	54
19	18.81%	1078	50.26
Nb of high decile sub-industries that have all 4 indicators above low decile	% of Sub-industries	TOTAL nb of Cies in these Sub-industries	Average CSR of these sub-industries
		15.37%	

As per the sub-industries dominated by the low CSR companies' scores, there are only two of them that have the overall indicators scoring above the ones of the high CSR group. There are only 66 members in this group but one thing interesting to note is that one of them is a sub-industry that is directly dealing with environment matters which is the Water, Sewage & Other Systems one. But we also need to mention here that among low CSR companies, only two of the members of this sub-industries get a DRSK score, so their presence in this selection is more a coincidence than an indisputable reality. Another

point to note is that the overall CSR rating average for these two sub-industries is at 52 a higher score than for the previous group but as mentioned above, with only two members. We definitively can't make any interesting assessment about these two sub-industries that have their "Low CSR" companies performing better than the High CSR ones. Please see table (4) below for details.

Table 4: Low decile, global assumption result			
Low Decile, Global assumption result			
Name of Low CSR Sub-industries companies that have all 4 indicators above High CSR cies		nb of Cies in the Sub-industry	Global CSR rating of the Sub-Industry
Travel, Recreation & Leisure		24	49
Water, Sewage & Other Systems		42	55
2	1.98%	66	52
Nb of low decile sub-industries that have all 4 indicators above high decile	In % of Sub industries	TOTAL nb of Cies in these Sub-industries	Average CSR of these 19 sub-industries
		0.94%	

We are now lowering our expectations by one level and focusing on sub-industries where "high CSR" companies have on average better scoring for all indicators but the Atman Z score. We found that the total number of sub-industries matching this criteria reach 40% of the total sub-industries. The total company's members of these 41 sub-industries are 3,325 out of the 7,014 companies rated by Csrhub.com, the average Csrhub.com overall rating for these companies is at 50.54. Please refer to table (5) below for details.

Table 5: High decile, partial assumption results 3 on 4

High Decile, Partial assumption results 3 on 4			
Name of High CSR Sub-industries companies that have 3 indicators (merton, roe/vol, beta min) above low CSR cics	nb of Cies in the Sub industry	Global CSR rating of the Sub-Industry	
Agriculture & Mining	52	50	
Mining (except Oil & Gas)	273	51	
Manufacturing	195	50	
Pharmaceutical & Medicine Manufacturing	206	52	
Textiles & Apparel	126	48	
Grocery and Related Product Wholesalers	30	56	
Lumber & Other Const. Mat'ls Wholesalers	7	46	
Agriculture, Construction, & Mining Mach. Mfg.	24	49	
Aerospace & Defense	70	54	
Construction Machinery Manufacturing	14	50	
Health Care Technology	14	48	
Medical Equipment & Supplies Manufacturing	131	49	
Food Products	170	51	
Personal Care Products	37	51	
Tobacco	18	51	
Biotechnology	106	49	
Healthcare Providers	32	51	
Medical & Diagnostic Laboratories	18	48	
Nursing & Residential Care Facilities	16	48	
Broadcasting & Advertising	73	50	
Data & Records Management	12	53	
Data Processing, Hosting & Related Services	30	50	
Newspaper, Periodical, & Book Publishers	45	52	
Retail	166	50	
Supermarket, Food & Beverage Stores	70	51	
Accounting, Tax Prep., & Payroll Services	30	53	
Architectural, Engineering, & Related Services	74	52	
Business Support Services	130	51	
Consumer Electronics Repair and Maintenance	16	52	
Facilities Support Services	19	57	
Investigation and Security Services	20	51	
Communications Equipment Manufacturing	85	50	
Tech Games & Gaming	19	47	
IT & Network Services	108	53	
Semiconductor & Other Electronic Component Mfg.	203	47	
Software & Internet	261	49	
Airport, Harbor Operations, & Logistics	81	52	
Water Transportation	58	49	
Resort & Casinos	22	44	
Electric & Gas Utilities	212	54	
Natural Gas Distribution	52	53	
41	40.59%	3325	50.54
Nb of high decile sub-industries that have 3 indicators above low decile	In % of Sub industries	Total L nb of Cies in these Sub-industries	Average CSR of these sub-industries
		47.41%	

On the other side of the spectrum when looking at the sub-industries which have their “Low CSR” companies beating the scoring of the High CSR ones on the Altman Z score, the 5 years return on equity/volatility and on the beta minus we get seven sub-industries (6.93%) matching these criteria with 424 members or around 6% of the whole Csrhub.com database. The largest sub-industry of this group is the Chemicals, Plastics & Rubber Products Manufacturing with 261 companies (more than half the total number of companies that belong to this group). The average Overall CSR rating is for this group is at 49.71. Please refer to table (6) below for details.

Table 6: Low decile, partial assumption result 3 out of 4 indicators

Low Decile Partial assumption result 3 on 4 indicators			
Name of LOW CSR Sub-industries companies that have 3 indicators (altman, roe/vol, beta min) above High CSR		nb of Cies in the Sub industry	Global CSR rating of the Sub-Industry
Chemicals, Plastics & Rubber Products Mfg.		261	51
Containers & Packaging Manufacturing		41	47
Motion Picture & Sound Recording		16	50
Diversified Consumer Services		26	48
Amusement Parks, Museums, & Other Sites		14	48
Travel, Recreation & Leisure		24	49
Water, Sewage & Other Systems		42	55
7	6.93%	424	49.71
Nb of low decile sub-industries that have 3 indicators above High decile	In % of Sub industries	TOTAL nb of Cies in these Sub-industries	Average CSR of these 19 sub-industries
		6.05%	

So at this stage we can only say that even if there is no univocal conclusion provided by the above tables there is at least one obvious bias which is that having an higher CSR overall rating leads mostly to an higher DRSK “Merton's based indicator” score without negatively impacting a company financials and equity behavioural performance. This is clearly not the case for the majority of the “Low CSR” rating group that nevertheless have a higher Altman Z score than their higher CSR scoring peers.

8.2 How countries are distributed between High and Low sustainability companies?

It is interesting to note that the average split between the High and Low CSR companies consolidated by country are 49.53% and 50.47% respectively. Meaning that to the exception of some countries that have only half a dozen of companies in this corpus, the distribution for each country is rather balanced.

No one will be surprised to see that the country which has the largest number of companies in our corpus is the United States with 686 companies - around 40% of the 1,697 companies analysed in this paper. It is however interesting to note that for this country, the High – Low CSR split is not in line with the overall average as the split is 60.06% for the low CSR decile and 39.94% for the high CSR decile. The poor result of the U.S. based company is a confirmation that the sustainability approach embraced by the largest companies - particularly the American incorporated ones- has not yet reached the majority of the country's entire corporates.

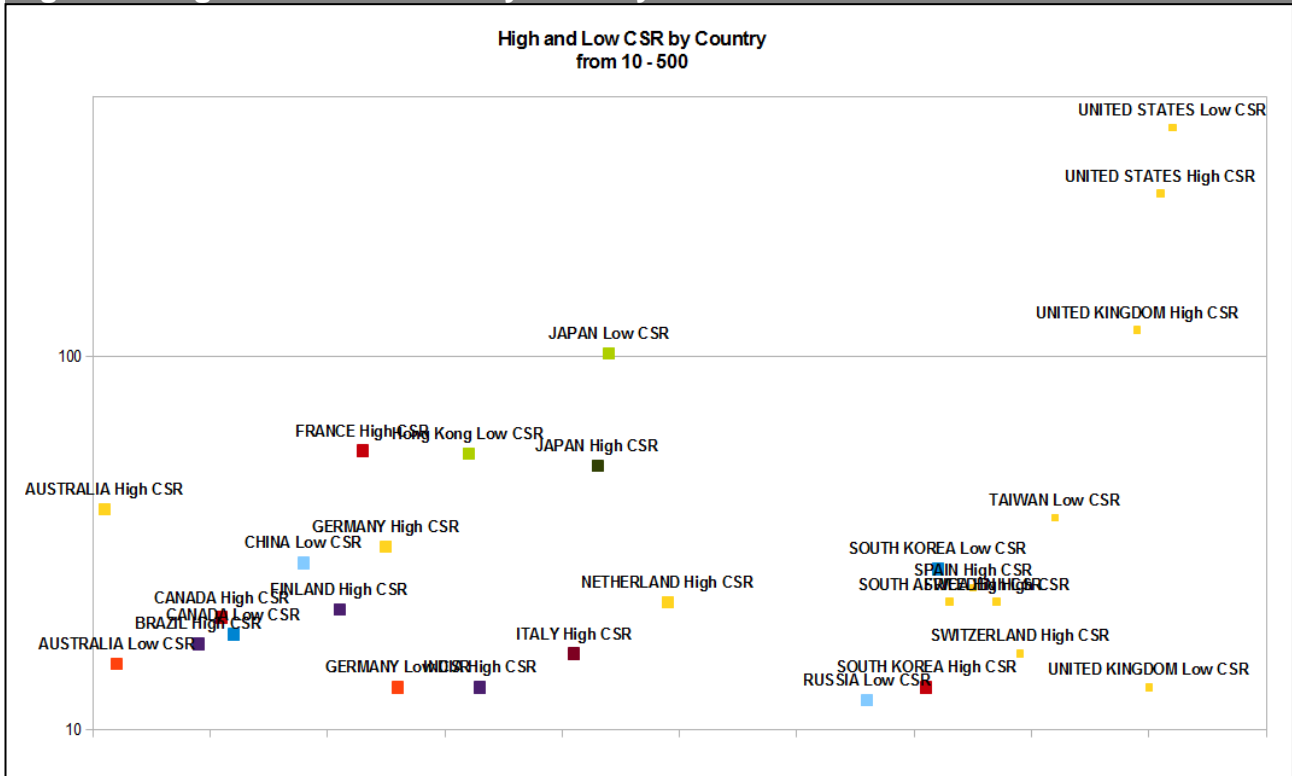
A fact that was confirmed in 2011 by a survey of KPMG which found out that “bigger companies are better at CR reporting; companies with revenues of more than US\$50 billion were twice as likely as those with revenues under US\$1 billion to report on their CR activities. As a result, large companies that are not already reporting on CR will soon run the risk of being viewed as less transparent than their peers. This data also points to a significant opportunity for smaller businesses to leverage their CR reporting as a competitive differentiator – and learn from what bigger companies have practiced to date“ (KPMG, 2011)²⁴.

However when looking at the poorest performing countries which albeit have a sufficient number of members to be representative we are not surprised to find the usual CSR laggards such as : Russia with 12 Companies all in the low CSR decile, China with 29 companies and only 1 in the high CSR decile selection, Hong-Kong with 59 companies and a ratio of 93.22% of low CSR decile and 6.78% in the high CSR decile, Taiwan with 41 Companies and a ratio of 9.76% vs 90.24%, and finally Japan with 2/3 of its 153 companies in the low CSR decile and 1/3 in the high CSR one.

²⁴ KPMG, 2011. International Survey of Corporate Responsibility Reporting, *KPMG International Cooperative* p11

On the bright spot the Anglo-Saxon world would be happy to note that the United-Kingdom has one of the higher positive ratio with 90% of their 131 companies in the high CSR decile and only 10% in the low decile selection. As for the developing markets believers, they will undoubtedly welcome the score of Brazil which has 17 of its 18 companies in the high CSR decile section. France, Finland and Italy have on average about 90% of their companies in the high end, showing that the North-South European usual opposition in terms of economical results or individual behaviour encounter an exception in the sustainability field especially as Germany shows only a ratio of 70% (high) vs 30% (low). Please refer to Figure (1) below to have a global overview of the country by country distribution.

Figure 1: High and low's CSR by country from 10 to 500



In order to complete the geographical overview, we also wanted to have a regional assessment. Thus we have consolidated the countries in so called “economical” regions inspired by the financial vision of the world. Next to plain geographical and political region like Europe or Asia-Pacific we have added the virtual economical developing region called “BRIC” (Brazil, Russia, India & China) created by Jim O'Neill the former Chairman of Goldman Sachs Asset management. We have also created a region called “Offshore” which includes all the micro countries which offer fiscal safe haven to multinational

companies. Indeed our assumption was that it will be more interesting to have a regional split inspired by the financial world as we are mainly comparing companies' financials ratios.

Thus when looking at the High and Low decile split in terms of world economical "region" we exhibit that the best performing region is Europe with more than 80% of its companies belonging to the High sustainability decile.

At the other end of the spectrum we unsurprisingly find the Asian-Pacific region (without China but with Hong-Kong) where nearly 70% of the companies are in the low decile selection. North America stay close to the United-States result with 40% (high) vs 60% (low) when the "BRICs" show an interesting balanced split around 50% with 47% (high) vs (53%) low, thanks to Indian and Brazil good scores. A quick word on the 18 "Offshore" members, to say that the result of 55% (high) vs 45% (low) indicate at most that the sustainability rating organization doesn't have an adverse approach toward companies which alongside sustainability measures have also implemented fiscal "optimization" structures. Finally, the worst performing region being South-America (without Brazil) with a ratio of 18.2% (high) vs 81.8% (low) but this region has only 11 companies which could then be considered as irrelevant. We think it was meaningful to show that behind individual countries performance we could find some regionally consolidated confirmation of how sustainability is distributed around the world. Please refer to the below Table (7) for the whole regional distribution.

Table 7: World regional distribution of high and low CSR companies

World "Regional" split of High and Low CSR companies															
Region	Asian Pacific		Europe		"Offshore"		BRICs		North America		South America		Middle East		
High/Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	
%	31.9%	68.1%	81.2%	18.8%	55.6%	44.4%	47.0%	53.0%	40.6%	59.4%	18.2%	81.8%	68.6%	31.4%	
nb of Cies	120	256	354	82	10	8	31	35	294	430	2	9	24	11	

8.2.1 How are the bankruptcy indicators scores by country?

Despite this not being the core subject of our thesis we wanted to see whether there was some interesting distribution of the Altman Z's and in the DRSK's scores consolidated by countries. We also wanted to highlight that for the DRSK there was a lot of countries for which there is no DRSK score computed by Bloomberg, mainly in the Asia-Pacific region.

In the Table (8) you will find the detail of the whole figures consolidated by country. Among the 46 countries that are in our corpus and that are displayed in Table (8), there

are only 16 countries that have DRSK (Merton) data for the high and the low deciles thus enabling a comparison between them. Among these 16 countries there are only 5 of them which have a better DRSK (Merton) results for the high decile. There are 763 companies in these 5 countries representing around 46% of our corpus. Among them is the United-States with its 686 companies, having the United States alone, in or out of its “team”, generates a massive difference of 41%. The others members of the “high decile better DRSK (Merton) team” are: Switzerland, Greece, Canada and Belgium.

As per the 30 countries that have no DRSK (Merton) scoring (or at least none in the low or high decile, like for instance Portugal) we mainly have Asian-Pacific countries; for instance China , Taiwan, Hong-Kong, Japan, India, Australia, Brazil, etc. The total companies of these countries amount to 565 countries or 33% of our corpus. This is certainly the weakest point of this research as having a scoring for these countries will undoubtedly have changed the overall outcome.

As per the Altman Z data, there are 31 countries that have data for the high and low decile to be compared. Among these 31 countries, 13 (or 42%) are showing a better Altman-Z ratio for the high decile than for the low decile selection. The total number of companies that belong to these 13 countries is only 250 which represent only 15% of our corpus (but as mentioned here above whether or not the United States is incorporated makes a difference). It is however interesting to note that among these 13 countries we find two countries that have aligned a large majority of low CSR companies in this research which are Taiwan with 90,24% of low CSR companies and South-Korea with 67.50% of its 40 companies being in the low decile selection. So does it mean that the few companies that are in the High decile selection have incredible Altman`s compared to the low decile or that we do not have enough data? Actually, there is enough data; in the case of South-Korea we have 38 data point for 49 companies and even the median confirms this result but the difference is very tiny with respectively, on average: 3,50 for the high decile and 3.42 for low decile and 2,80 vs 2.55 for the median. Regarding Taiwan we have the data for 39 of the 40 companies, the average difference is also very tiny with 4,49 (high) vs 4,26 (low) but the median is turning in favour of the low decile selection with 3.84 (high) vs 3.91 (low).

Table 8: Companies analysed in this research from 46 countries

Companies analysed in this research come from 46 countries			
List of countries where on average, High CSR have an higher Alt-Z score than Low Csr ones		List of countries where on average, High CSR have an higher DRSK score than Low Csr ones	
Country	Total nb of Companies	Country	Total nb of Companies
BELGIUM	6	United States	686
BRAZIL	18	Switzerland	25
FRANCE	59	Belgium	6
GREECE	8	Canada	38
INDIA	19	Greece	8
IRELAND	9	5	763
ISRAEL	4	31.25%	45.74%
MALAYSIA	6	of all countires	of all companies
MEXICO	5	having a DRSK score	
NORWAY	10		
SOUTH KOREA	40		
SWITZERLAND	25		
TAIWAN	41		
13	250		
41.94%	14.99%		
of all countires	of all companies		
having a Alt-Z score			

Table 9: Altman-Z score, distress assessment, high and low's CSR comparison

ALTMAN Z Score Distress Assessment			
High CSR Cies		Low CSR Cies	
Investment Grade		Investment Grade	
Average	5.25	Average	6.65
Median	4.42	Median	5.27
"High Yield"		"High Yield"	
Average	2.39	Average	2.35
Median	2.40	Median	2.35
Distress		Distress	
Average	1.20	Average	1.10
Median	1.28	Median	1.19
Overall		Overall	
Average	3.67	Average	4.57
Median	3.09	Median	3.53

9 Hypothesis about why the DRSK (Merton based) and the Altman Z-score are producing different outcome in this paper

Despite the fact that these 2 distress assessment models are supposed to provide the same kind of financial information, there is barely any common ground to the construction of these 2 indicators. To summarize briefly the difference, already exposed in chapter 2, the Altman Z score is mainly based on a formula using static data, taken from the company's financials, when the DRSK (Merton) model take its roots in the option pricing world and also integrates, in its formula, the liability of the pension fund, the volatility, the expected growth rate of its components as well as the equity and debt markets current conditions. Basically it's like comparing secret services trying to get information by analysing enemies' documents against the resources of the National Security Agency (NSA). Indeed both are providing results but the holistic approach of the latest clearly contrasts with the inequity of the former. Furthermore, as the Altman Z score is, among others indicators, used by financial lender to assess the risk of its debtors, accounting consultants have been used to manipulate the ratios used for its construction. But this remains pure speculation. Let's be more pragmatic by trying to find some more actual elements by digging into the companies' results.

As exhibited in the table (9) the Low CSR companies' scores are only higher than the ones of the High CSR companies in the "Investment Grade"²⁵ section. In this zone, we have an average Altman Z score of 6.65 for the 441 members of the Low CSR group and 5,25 for the other group (with 5.27 vs 4.41 respectively for the median). Thus the advantage in favour of the Low CSR companies with regards to the Altman Z scoring and which is staining the global assumption of this thesis, comes from this particular section where, "Investment grade" companies are able to provide on average a higher scoring than the other group. The number of "Investment Grade" members for the High or Low CSR groups is essentially the same in this zone, with 425 for the Highs and 441 for the Lows. This should enable us to validate any finding that may result from a deeper analysis of these groups. When looking at the distribution frequency, firstly at the overall level (cf Figure (6) below) then focusing at the Investment grade level, we note that the overall distribution is showing a concentration of "High CSR" companies, just below the three thresholds, when the Low CSR companies scores are mainly concentrated just afterwards.

²⁵ The "Investment Grade" section in this paper correspond for the Altman Z- score to the "safe" Zone of the discrimination zones Wikipedia, (2013). Altman Z-score. [Online] Available at: http://en.wikipedia.org/wiki/Altman_Z-score. [Accessed in July 2013].

When zooming at the investment grade scale (cf Figure (7) below), we note that the downhill at the top-right for the Low CSR companies is not gradual before the 8th grade. The High CSR line looks more like the overall distribution curve, which looks like a plain vanilla Gaussian distribution one.

Continuing our top-down analysis exercise by looking more closely at those “dark grey swans”²⁶ to try and understand them a little bit more. Do those companies have a DRSK score confirming they are also belonging to the “investment grade” zone of our second distress assessment indicators? The answer is apparently, “No”, as only 60% of those companies have a DRSK below the 0.30% threshold, qualifying them as “Investment grade” issuers. So basically 40% of them are missing. We now would like to know more about those 178 (40%) companies which have been rated as “Investment Grade” by the Altman Z score and who, apparently, are not considered the same way by the DRSK. The issue here is that on those 178 companies scored by Altman, only 9 have a DRSK (Merton) scoring. So unfortunately, we won't be able in this paper to assess how many of them are really in the DRSK “High Yield” and whether their Altman Z score grade could be challenged further. But this would be an analysis that we would only be able to perform in future works when more companies (from the Asia-Pacific region mainly) will finally get a DRSK scoring (from Bloomberg).

²⁶ An allusion to the book of Taleb, 2007 *The Black swan: The Impact of the Highly Improbable*, Penguin Books

Figure 2: Altman-Z overall distribution frequency

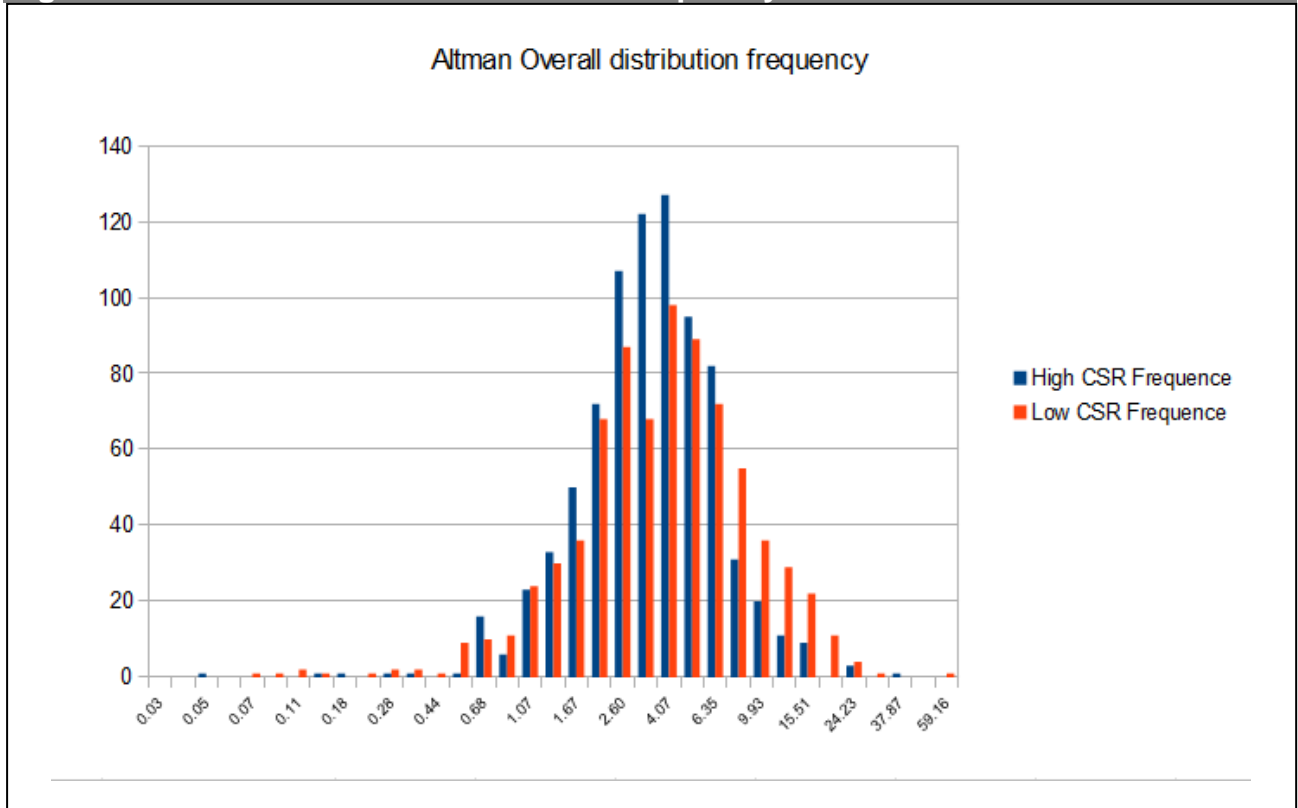
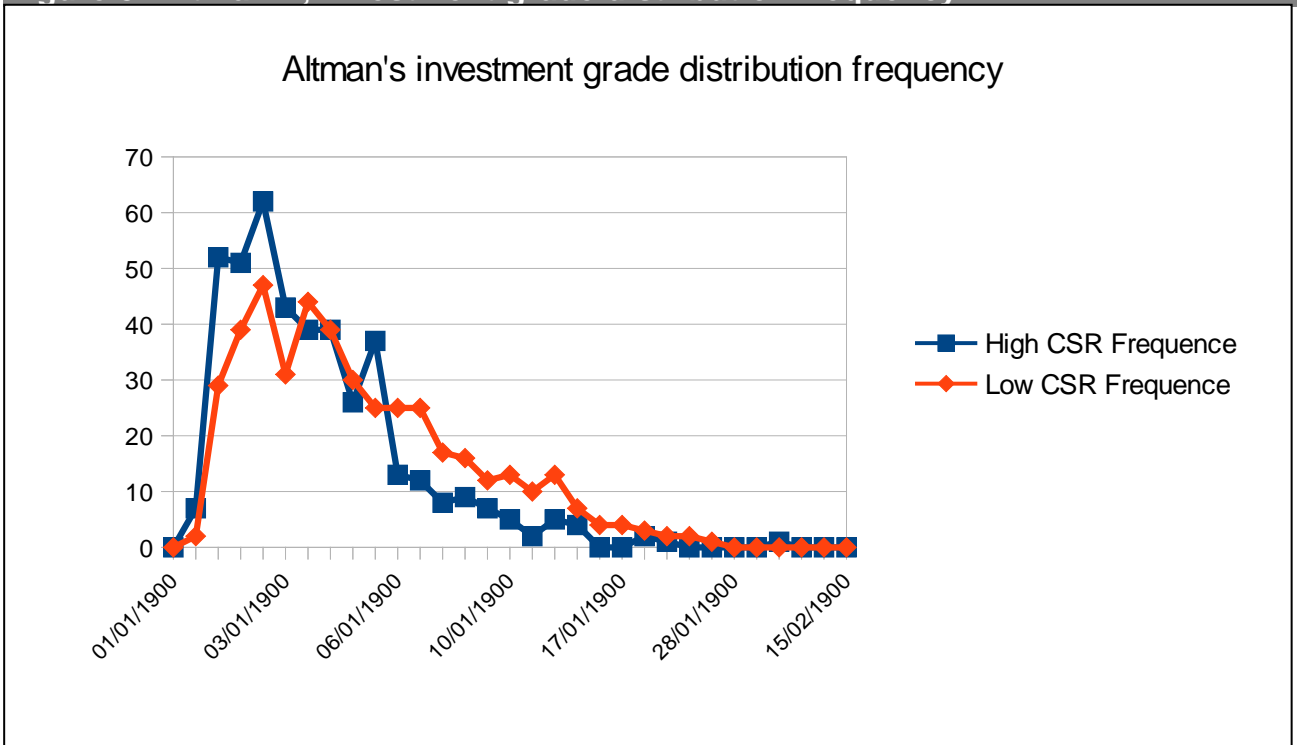


Figure 3: Altman-Z, investment grade distribution frequency



10 Conclusion, futures works to be perform

To conclude this paper, we will first summarize what our expectation was in performing this work and then formulate what might be done to give a follow up to our research.

10.1 Does the outcome of our research validate our assumption?

Our basic assumption was that the companies which have integrated Corporate Social Responsibility principles into their business development did not do so at the expense of their shareholders' basic expectations.

The objective of this paper was to obtain a statistical confirmation about this belief. By using two different generations of distress assessment measures²⁷, we have added an additional level of complexity. As a result this additional element has negatively impacted the overall conclusion.

However, as our main focus was to emphasize the quality of the balance sheet rather than focusing on the income side of the performance, we assumed that having a confirmation by two different tools would have been necessary to provide more strength to the outcome.

Moreover, this approach was also aimed at overcoming the fact that the Csrhub.com historical database is too short. Therefore it is not possible to perform comparisons analysis during various economical cycles. Should we revert to the results provided by our "home-made" indicators, the ROE/200d Vol. on Beta minus, we note that in more than 80% of the 101 sub-industries analysed, the High CSR deciles performed better on this ratio of ratios than the Low CSR decile.

Accordingly, we are assured to have provided another proof that companies which were best ranked by various sources for their actual implementations of sustainability measures and strategies have been able to provide their shareholders with a sounder balance sheet and a lower levels of equity volatility than those who don't; at least during the past five years.

This outcome should definitively be perceived as an encouraging sign for long term investors, among which pension funds. Despite two major financial markets collapse in

²⁷ The Altman Z score was designed in 1968 and the DRSK in 2012

less than ten years²⁸, there is some strong evidence that by holding equities of the most innovative companies, in terms of social and environmental commitment, they will be able to meet their liabilities.

10.2 Additional works to be performed

We are seeing 3 major directions in which additional work could be performed in order to enhanced or undermine the outcome of our research:

- a. Adding third distress assessment indicators that will be used as a proxy when either one or the other indicators return no data for a company.
- b. Performing the same analysis using the same tools but in a different point in time, ideally in a different economical cycle.
- c. Analysing by doing correlation testing delayed in time to assess whether it is because a company has a good CSR ranking that it delivers sound financial results or whether this is the other way around. Unfortunately, even though CSRHUB.COM has been set up in 2008 the available historical data covers “only” the last 2 ½ years. Only 2 years of CSR data are unfortunately not enough to perform such a task.

²⁸ The Internet Bubble of 2001 and the Financial crisis of 2008

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