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**PhD DISSERTATION**

**Value Added Sustainable Procurement  
Customer's Perspective as perceived by companies :  
An Empirical Study of Western European Food and Beverage  
Companies.**

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## **Περίληψη**

Σήμερα, οι αιφορικές προμήθειες θεωρούνται ως ιδιαίτερα δημοφιλής πρακτική για τις επιχειρήσεις, δεδομένου ότι εφαρμόζονται ως τμήμα μιας ευρύτερης αιφορικής στρατηγικής ή αποκλειστικά ως τμήμα της λειτουργίας των προμηθειών.

Την τελευταία πενταετία οι αιφορικές προμήθειες εφαρμόστηκαν κυρίως σε τακτική βάση, στοχεύοντας κυρίως στη μείωση του περιβαλλοντικού κόστους σε δραστηριότητες προμήθειας με προμηθευτές. Πάντως, κατά τη διάρκεια της τελευταίας πενταετίας, πέραν της περιστολής του κόστους, η εφαρμογή των αιφορικών προμηθειών από τη Διοίκηση έχει συχνά καταστεί το πρόσχημα για την αποτελεσματική λειτουργική βελτίωση και τη δημιουργία νέων αιφορικών προϊόντων, την ανάπτυξη εξειδικευμένων αγορών (niche markets) και την αύξηση του μεριδίου αγοράς. Έτσι, οι αιφορικές προμήθειες έχουν καταστεί νέο μέσο της Διοίκησης για την υλοποίηση στρατηγικών που στοχεύουν στην απόκτηση των βέλτιστων δυνατών προμηθειών, κοινωνικά ή ηθικά αποδεκτών στους καταναλωτές, ενώ προστατεύουν το περιβάλλον από την ρύπανση και την εξάντληση, συνεπώς δε στη διατήρηση του συγκριτικού τους πλεονεκτήματος.

Σκοπός αυτής της διατριβής είναι η διερεύνηση των διαστάσεων του φαινομένου αυτού, ιδιαίτερα στο πλαίσιο της Δυτικής Ευρώπης, και η κατανόηση της ύπαρξης κάθε στρατηγικού προσανατολισμού στη λήψη συναφών αποφάσεων. Προκειμένου να προσεγγίσουμε το αντικείμενο με τον καλύτερο δυνατό τρόπο, καταγράψαμε την έκταση αυτής της εφαρμογής στις δραστηριότητες των επιχειρήσεων και μελετήσαμε τα χαρακτηριστικά των αποφάσεων και την συμπεριφορά αυτών των επιχειρήσεων ως προς τις πράσινες προμήθειες. Αυτό επετεύχθη, από τη μία πλευρά με τη διεξαγωγή έρευνας με τη χρήση ερωτηματολογίων που απεστάλησαν ηλεκτρονικά σε επιχειρήσεις ποτών και τροφίμων που λειτουργούν στη Δυτική Ευρώπη, και από την άλλη με τη διεξαγωγή follow-up συνεντεύξεων προς επιβεβαίωση και

περαιτέρω σε βάθος αναζήτηση πληροφορίας που δεν λαμβάνεται ευχερώς μέσω ερωτηματολογίων. Τα αποτελέσματα της έρευνας μας επιτρέπουν να διερευνήσουμε θεμελιώδεις παραδοχές θεωριών που εφαρμόζονται στις αιφορικές προμήθειες επιχειρήσεων. Αυτό μας οδήγησε σε αριθμό συμπερασμάτων που αφορούν τη συμπεριφορά των επιχειρήσεων σε επιτυχώς εφαρμοσμένες αιφορικές προμήθειες, τα προβλήματα και τη στρατηγική διάσταση αυτών των αποφάσεων και την εφαρμογή αντίστοιχων θεωριών σε δυτικοευρωπαϊκές επιχειρήσεις τροφίμων και ποτών. Τα κύρια συμπεράσματα της μελέτης αναφέρονται στη συνεχώς αυξανόμενη χρήση των αιφορικών προμηθειών των επιχειρήσεων που λειτουργούν στη Δυτική Ευρώπη, στην αξιοσημείωτη υιοθέτηση των αιφορικών προμηθειών και την αναγκαιότητα εφαρμογής μιας σύμμειξης θεωριών για την εξήγηση της συμπεριφοράς των επιχειρήσεων ως προς το ζήτημα των αιφορικών προμηθειών.

Τελικά, με βάση τα συμπεράσματά μας και τις βέλτιστες πρακτικές της διεθνούς συναφούς βιβλιογραφίας, δημιουργήσαμε επιρροές που συμβάλλουν στη μείωση πιθανών απωλειών και αύξηση κερδών των επιχειρήσεων από τη χρήση των αιφορικών προμηθειών.



## **Abstract**

In our days, sustainable procurement is considered as a particularly popular practice for companies, being implemented as a part of a larger sustainability strategy or solely as part of the procurement function.

For the last ten years, sustainable procurement was applied primarily at a tactical level, aiming mainly in reducing environmental costs on procurement activities with suppliers. However, during the last five year period, besides cost cutting, the sustainable procurement implementation by management has often become the pretext to improve operations efficiency and generate new sustainable products, develop niche markets and grow market share. Thus, sustainable procurement has become a new means for management to implement strategies aiming at the acquisition of best possible supplies which are socially and ethically acceptable to consumers while preserving the environment from pollution and depletion, hence in the maintenance of their competitive advantage.

The aim of this dissertation is to investigate the dimensions of this phenomenon, specifically in the Western European context, and realize the existence of any strategic orientation to the relative decisions taken. In order to approach this subject in the best possible way, we recorded the extent of its application to the activities of companies and studied the characteristics of the decisions and the behavior of these companies with regards to sustainable procurement. This was achieved on the one hand through a research conducted using questionnaires that were emailed to food and beverage companies operating in Western Europe and on the other hand by conducting follow-up interviews to validate and seek further in-depth information not readily obtained through the questionnaires. The results of the study allowed us to investigate basic assumptions of theories applied to sustainable procurement of companies. This led us to a number of conclusions regarding

the attitude of companies to successfully implement sustainable procurement, the problems and the strategic dimension of these decisions and the implementation of the respective theories in Western European food and beverage companies. The main conclusions of our study referred to the ever-increasing usage of sustainable procurement of companies operating in Western Europe, the considerable adoption of sustainable procurement, and the necessity for the application of a mix of theories to explain the behavior of companies regarding the issue of sustainable procurement.

Finally, based on our conclusions and best practices found in the literature, we made implications that will help companies minimize their possible losses and optimize their profits from the use of sustainable procurement.

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## **1. Introduction**

### **1.1 Structure of the Dissertation**

This Dissertation contains an Abstract in English and Greek, a Table of Contents, a Table of Tables, Figures, Diagrams and Maps and consists of eight Chapters as follows:

Chapter one is the introduction. in this chapter we define the object, purpose and contribution of the study and state the main research questions.

Chapter two focuses on presenting a detailed summary of the relevant quality standards which are typically used by food and beverage companies in Western Europe. It covers important topics including, European Food Safety, with a breakdown of EU Legislation and regulations, the domains of Agriculture and Transportation, the Food Manufacturing area, The important participative role of the Consumer with regards to Safety practices and to avoid the problems related with Food contamination and details on issues related to Pesticides, Antibiotics and growth promoters, industrial pollution, and the “mad cow” disease known as Bovine spongiform encephalopathy and a conclusion for that subsection. The second chapter then expands into a presentation of HACCP and ISO standards (including 9000, 22000, 14001) and the European Environmental Management System (EMAS). It then presents details about the structure and key elements of the UK up and coming to the rest of Europe BS8903 principles and framework for procuring sustainability standard. This chapter closes with the very important for Risk Management ISO2600 standard with references to reducing the supply chain vulnerability, finding solutions, risk identification and assessment, risk avoidance and reduction, and closes with the topic of risk acceptance and transfer.

Chapter three covers all elements of the Dissertation literature review. It defines the concepts and characteristics of sustainable procurement and presents the factors that affect positively or negatively the relevant decisions in

accordance with the international literature. It discusses the procedure, guidelines followed and inclusion criteria used for searching in literature databases, it presents the selection and data reduction process and the criteria for exclusion of assembled literature sources. This chapter also presents the key findings from the literature review prior to 2011 and focuses on two better articles prior to 2011. This chapter provides key definitions from literature on SMEs, performance measurement, and sustainable procurement. In this chapter the business case for a company's implementation of sustainability is discussed with supporting literature references. The topic of customer expectations for companies to be socially responsible is supported by the relevant references in literature. The chapter then looks at recent updates in literature since the study completion and provides a gap analysis and a conclusion.

Chapter four presents the Research Methodology and explains materials and methods, sample and data collection, measurement and the key hypotheses of the Dissertation. Besides the methodology subsections, the rest of that chapter consists of three sections which present the results of data processing. The first section presents the descriptive statistics of the data. It describes the methods used for the statistical analysis of the data collected. The chapter introduces the statistical data processing, process and tests performed in SPSS version 20 with a split in two areas: statistical results for the whole sample and statistical results for SMEs. The second section discusses the main factors in the variables related to the environment in which the sample companies operate. The final section explores the existence of correlations between variables that express the factors that influence sustainable procurement, and the environment of companies that are active in this area.

Chapter five discusses the synthesis of quantitative and qualitative interview data, the research interview questions, the format, and key findings regarding the corporate environment and the decision making process, the companies sustainability self-evaluation results by country, a table presenting the quality

management certifications used by companies and conclusions about consumer added value sustainability priorities as presented by companies.

Chapter six is more theoretical but provides the tools required to monitor and measure sustainability, it presents the value chain according to Porter adapted for sustainability, the DuPont ratio and other derived accounting ratios, a diagram of key financial drivers and our recommendation on how to match company offer elements with the consumer demand so as to attain the purchasing decision. This chapter concludes by presenting areas of profitability and growth such as packaging and labeling, and niche market strategy.

Chapter seven is an extensive discussion of research, it provides conclusions and our proposals to businesses and finally recorded the restrictions on the generalization of the findings and made suggestions for future research. It contains the discussion of the research with a more focused examination of specialized topics of the consumer in times of economic crisis, supplier management before entering into the conclusion where the dissertation closes with the key achievements and limitations.

Chapter eight is the bibliography of all sections of the dissertation.

It is followed by Appendices, which include a Guttman Scalogram Table for SP in SMEs as resulting from our analysis, a Table of SMEs surveyed on SP by country and industry, a table of variables correlations for the SMEs in our F&B sample, a summary of the author's original publications, a list of Abbreviations/Glossary and a Link to the original Questionnaire with the German and French translations of the original English Questionnaire. It includes a description of related Quality Standards and detailed SPSS statistical analysis results.

## 1.2 General Approach

The environment in which modern companies grow and operate is characterized by factors such as the globalization of the economy, competitive pressures, frequent and sometimes violent changes in technology and preferences - consumer demands. To meet the above conditions, but also to meet the demands of their shareholders for best results, companies try to implement strategies that will produce a competitive advantage, improve operational efficiencies, reduce costs and hence viability and profitability. One of the "tools" at their disposal to achieve the above is the practice of Sustainable Procurement. Over the last decade, the phenomenon of sustainable procurement took explosive dimensions, penetrating all the activities of the business value chain and making it a strategic tool for business development. This is confirmed by the pace moving the global market of sustainable procurement, each time increasing the overall value of the contracts. Indeed, forecasts show this trend remains upward for years to come. Sustainable procurement involves applying sustainability to the procurement function. It is the supply or purchase of products and services which takes into account the following: 1) Economic value - quality, suitability for use, use of life cycle costs, etc. 2) Environmental issues, 3) Complete product life cycle, 4) Social characteristics - sustainable supply chains, working conditions, hygiene and job security, compliance with business and environmental regulations and professional ethics. The concept adds economic, social and ethical issues in this environment and health. Includes "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (Brundtland Commission Report, 1987). Sustainable procurement is applicable to the public or private sector, We chose to focus exclusively on the private sector, to avoid comparing public policies and European member state political programs and motivations. Until now purchasing strategies of most larger companies have focused on the mechanisms and structure and failed to analyze procedures and the experience of successful implementations and their consequences for companies' profitability.

### **1.3 Subject – Purpose of the Research**

The Business Case for Sustainability (BCS) (according to Salzman et al 2005 – let us quote , “may exist but may often be marginal in practice and/or difficult to detect. It appears to be mostly limited to the reduction of downside operational risk and to measures to increase eco-efficiency, the “no-brainers” of good (rather than corporate sustainability) management. The economic value of more sustainable business strategies is a lot more elusive, since it only materializes in the long term. Furthermore, effects on intangible assets (e.g. brand value, employee loyalty) are difficult to quantify.” The same authors assert that a lack of descriptive studies on BCS and on its implementation in corporations was identified as the most significant gap in the existing literature. The same authors “that “Inadequate sampling techniques, also due to limited data availability. Empirical studies have focused mainly on large, pan-sector samples, which may have masked sector-specific differences such as unique internal competencies, external pressures, degree of public visibility, stakeholder configurations, level of regulation, etc. A few studies took more differentiated perspectives (Greening, 1995; Moore, 2001; Simpson and Kohers, 2002) by focusing, for example, on one particular industry or comparing different industries and plants” and that “A great number of studies have examined internal and external drivers and barriers to corporate sustainability management (Bansal and Roth,2000; Henriques and Sadorsky, 1995; Lawrence and Morell, 1995; Sharma et al., 1999; Skjaerseth and Skodvin, 2001; Winn, 1995). Some of them implicitly took the economic rationale into consideration” (Salzman et al 2005). However, the literature reveals shortcomings: There are very few cross-industry comparative such as the ones of Henriques and Sadorsky (1996) and Banerjee et al. (2003). None of which have looked at both industry and effects on the surveyed countries. A clear attempt to minimize the negative effects of the above mentioned limitations was made with the approach to explore the subject and conduct the research. We now explore the elements of the dissertation and its importance for Academia.

Sustainable Procurement (SP) also known as “Green Procurement” (Lacroix



R., 2010a) is "using procurement of suppliers and processes to deliver long-term social, economic and environmental value for products and services" (Lacroix R. et al. 2014). Sustainable procurement now requires suppliers to understand the sustainability drivers that SMEs are specifying in their procurement decision making (Lacroix R. et al, 2012). Most-leading suppliers now publish their sustainable procurement objectives. In spite of the challenges in SP most firms seem to uncover and to exploit new opportunities (Lacroix R. et al. 2010), (Lacroix R. et al. 2012).

Large companies are the natural starting source of researchers – because they are the accepted pioneers in implementing new technologies innovation (Verghese, K. & Lewis, H., 2007)), they have an established quality culture, and they develop best practices - new standards - for others to compete. So when we decide to look into sustainable procurement the initial main sources of information are large companies that benefited (profits from sales and environmental responsible public image with their customers) from that experience. Some of the associated benefits, cost reductions, and economies of scale, improved brand image as an "ethical" company and increased customer Loyalty and in some instances increased market share.

SMEs: SMEs are very important for the economy of Europe and are a source of innovation (Theyel, G. 2000), (Lacroix R., Stamatidou E., (2006), (Lacroix R. 2008) and R&D which provide over 2/3 of the private sector jobs (Harindranath et al., 2007). By Looking at some statistics we realized how SMEs are important to Western Europe: Official EU statistical data shows how SMEs represent the majority of companies across Europe yet their importance is not representative (less than 5% of the sources) in our western research databases and journals literature references. For illustration of this Academic injustice: Eurostat data of 2010 indicates that 99.8% of companies in Europe have less than 250 employees. They generate 66.9% of employment, 57% of turnover and 58% of value-added. In the Food and Beverage industry SMEs account for over 68% of EU's exports. Observatory of European SMEs data of 2010 indicates that micro-enterprises with less than ten employees account for 92% of the total number of enterprises. They indicate that they account for

30% of employment and 18% of turnover and 22% of value-added. Finally, we are told that 'small' enterprises with less than 50 employees account for 97% of the total number of enterprises, 50% of employment across Europe, 37% of turnover and 39% of value-added. Therefore, the majority of the EU economy is made of micro-firms which generate work for two people (Observatory of European SMEs -March 2014), thus play a very important socio-economic role in the local economies. SMEs are the engine of growth with potential for a higher involvement in internationalization, because of their flexibility and the quick adaptation of their management, (Welford et al. 2003).

Most Academics believe that large companies because of several factors such as their size, operations management infrastructure and organization, and a larger Research and Development budget have an advantage, and that is true. It is believed that large companies have easier access to financing than their SMEs counterparts and because of that are in a better position to compete against SMEs (Sharfman et al., 2007). Some SMEs are highly specialized and focused in profitable "niche markets" and are leaders in sustainable procurement (Rao, P. et al. 2007). Some authors also see SMEs competitiveness as dependent on the acquisition of tools or enhancement of existing performance monitoring and measurement (Sharma, Bhagwat and Dangach, 2005). Some even suggest that SMEs have difficulties in finding external financing and sufficient internal owner investment capital, employee turnover, inadequate facilities, low technology use and face bureaucratic delays in dealing with numerous regulatory agencies/taxes/levies etc., (Jamil and Muhammed, 2011). Other authors claim that SMEs have the right tools for performance measurement (Taticchi, Balachandran, Botarelli and Cagnazzo, 2008). Others still maintain that SMEs have an accounting system with limited capabilities for measuring the financial performance of SMEs (Fry, 1992), (Garengo P. et al. 2005), (Montabon F. et al., 2005), (Taticch P. et al. 2008). The relevant key concepts found in the literature are:

**Sustainable procurement** (green procurement): use of supplies from companies, public authorities or legal entities which take account of environmental considerations into products or services in order to reduce the

impact on human health and the environment (environmentally friendly public transport, recyclable paper, organic foods , electric cars, etc.).

**Environmentally preferable purchasing (EPP)** (environmentally preferred procurement): choice and demand of products and services that reduce the impact on the production cycle, transport, use and recycling and disposal (products made from recycled materials with the possibility of reuse / recycling, renewable energy, as biofuels, solar and wind energy, alternative fuel vehicles and products).

**Lifecycle costing (LCC)**: total product or service cost during its life cycle (purchase price, transportation, use, maintenance and disposal costs), and now includes wider costs to society (environmental and socioeconomic degradation).

**Concept of innovation**: No succinct definition is available (Amara and Landry, 2014); however, the many attributes help explain the concept such as "newness" which some authors debated as "new to whom" and "new in what way?" (Discussion in Johannessen et al., 2001) and, there are two archetypical ways to differentiate between the various "types" of innovation. Schumpeter in 1934 suggested the first as "objects of change" to refer to products, processes, markets, and organizational innovations. The second refers to "the radicalness of some change" meaning that it brings about a revolutionary amendment. We focus on the second approach in our definition of "innovation."

**Concept of the Deming PDCA wheel**: was the invention of his friend Shewart of Bell Laboratories (Shewart W.A., 1939). But Deming was the person who popularized it in Japan right after World War II (Deming W.E., 1993).

**PLAN**: The "Plan" Phase is used to identify and overcome any new obstacle blocking your progress towards your management set objectives.

**DO**: The "Do" phase is used to create a small-scale pilot to test your hypothesis to see if it resolves the obstacle.

**CHECK**: The "Check" phase is used to analyze the results to derive some lessons.

ACT: The "Act" phase is used to take some corrective action. If the results were positive, you would take measures to roll out the changes into your existing processes. Else, assuming the results did not confirm the hypothesis, you need to create a new one and a new test to tackle that newer hypothesis.

According to Helen Walker (Walker et al. 2009), the first major milestone in identifying the principles of sustainable procurement was reached in 2005 when a private sector led Procurement Task Force in the UK created the report "Procuring the Future" (UK National action plan for Sustainable Procurement, 2005). This particular report listed 5 phases for the initial implementation and the "Flexible Framework (tool)" created to evaluate the maturity of firms. With major revisions, it was published by BSI in 2010 as British Standard – "BS8903: Principles and framework for procuring sustainably." This standard as we learn from the BSI website targets UK public and private sector organizations' procurement decision making. The standard offers recommendations in the procurement process and addresses areas like environmental policy & strategy, risk management, leadership, measurement, etc. Unfortunately, the specific standard being very generic did not have much acceptance outside of the UK. Given the low acceptance of this particular standard in its current form, outside of the UK, some SMEs suggested we look instead at their current mode of operation and extract from it their best practices. This recorded experience resulted in the "Implementation Maturity Evaluation Model" which will be present further in this thesis. In our bibliography search for the period 2004-2014, about 2500 journal articles addressed sustainable procurement. A particular article from 2007 discusses the increased number of journal publications and special issues on sustainable procurement (Srivastava, S. K. 2007) as confirmed also by Walker Helen (Walker, H. 2009) "in the Journal of Operations Management entitled 'Supply chain management in a sustainable environment' (Jayaraman, Klassen, & Linton, 2007). By the mere variety of articles published in journals, we see this area of research is important and timely for the academic community. Some examples include: In Supply Chain Management: an International Journal 'Corporate Social Responsibility in the Supply Chain' (Lindgreen, Maon, Swaen, & Vanhamme, 2008), and in 'Sustainable supply

chain management: Theory and Practice' (Pagell, Krause, & Klassen, 2008).

Implementing sustainable procurement processes has become an opportunity for many SMEs to create an infrastructure to support the Total Quality Management (TQM) processes and improve operations efficiency and expose any gaps between the SMEs objectives and observed performance.

Sustainable Procurement in SMEs is one of these new topics worthy of an empirical study. The testing of theories is not intended to criticize them, but to deliver evidence to the degree of their success and to confirm the strategic or costing nature of the decision to practice sustainable procurement and to draw conclusions on the importance of internal and external factors in the associated decision-making of the management of these companies. Our humble objective was to perform a study to identify the existing state of sustainable procurement in Food and Beverage companies (Large and SMEs), located in Western Europe, to measure their state of maturity, to develop a tool for that measurement and make recommendations for the tool's use for self-evaluation by these companies.

Many Journal articles discuss sustainable procurement, however none focused on the relationships between sustainable procurement market leaders in the food and beverage industry and their investment in training, their TQM practices, their innovations, and how SP packaging and labeling adds value to consumers. The four main ideas retained for exploration in this thesis are listed below:

1. The companies-leaders in the field of sustainable procurement invest in specialized training of their staff on issues of sustainable development.
2. The companies-leaders in the field of sustainable procurement are leaders in the field of TQM.
3. The companies who are leaders in the field of sustainable procurement are those characterized by innovations.
4. The investment in sustainable packaging and labeling offers no added value to consumers

#### **1.4 Contribution of the Research**

**Purpose:** This study investigates the nature and type of daily sustainable procurement implementations of companies (Large and SMEs) located in Western Europe including Switzerland to identify the state of their maturity.

**Design/methodology/approach:** The Empirical Study of Food and Beverage companies operating in 2012 and 2013 in Western Europe including Switzerland collected the data through the use of a quantitative web survey and qualitative interviews of respondents. The companies targeted for the survey came from the European Chambers of Commerce 2012 self-ranking database of their members (where members self-evaluated their companies as "Sustainable" for matching criteria such as "Having an Environmental Policy," "Reducing Energy and Water Consumption" and "Performing Recycling"), where the search was further restricted to companies belonging to the Food and Beverage industry operating in Western Europe and Switzerland.

**Findings:** 1) SMEs also practice sustainable procurement like large companies. 2) Companies that have sustainable procurement tend to have tools and metrics to measure SP results and estimate they are profitable. 3) The best of these companies apply Total Quality Management (TQM) principles in their operations and invest in training of their sales and procurement staff. 4) A model of 13 questions reflects on the state of sustainable procurement in European Food and Beverage SMEs. The applicability of the resulting model inspired from the Guttman Scalogram should prove helpful for SMEs.

**Research limitations/implications:** Because we depend on self-reported information from the SME we accept responses as being accurate and truthful and use our judgment to identify trends and provide some meaning.

**Practical implications:** Presenting a new Sustainable Procurement Model Inspired from the Guttman Scalogram allowing SMEs to:

- 1) Self-evaluate, and identify their current maturity level on that scale,
- 2) Compare their maturity levels with best in class higher rated on the scale

leaders from Western Europe (where according to Eurostat Switzerland and Northern Europe lead the pack) and optionally use the information as a differentiator in their competitive advantage strategy for Niche and other Markets.

3) Enable management to improve their operational performance by gradually encompassing the not currently implemented processes and measurements of that model and taking corrective action in accordance with Deming's principles of continuous improvement.

This scale comprised of 13 questions may prove to be the most-critical catalyst at the SMEs disposal to capitalize on SME Sustainable procurement innovation efforts. The research results provide answers for companies not familiar with the implementation of Sustainable Procurement into their business operations.

**The Model:** was developed for SMEs in the Food and Beverage industry, helps compare their specific maturity with regards to their sustainable procurement implementation. We see no reason this model could not apply to other geographic locations or be adapted to check sustainable procurement maturity of SMEs in other industries. Our hope is that a future research will improve and adapt this model to allow more followers and those SMEs who are new to the concept to implement Sustainable Procurement. The empirical study results suggest a need for SMEs entrepreneurs and their firms to upgrade their training and to increase their reliability on tools and metrics in order to enhance their innovation and Sustainable Procurement capabilities.

**Originality/value:** – This study unveils the Sustainable Procurement Innovation practices of this growing economy of food and beverage companies and particularly focuses on the less explored of these in a Western-European context. A major contribution of the study is that it will attempt to determine the existence of correlations between the causes which motivate companies to practice sustainable procurement while highlighting the potential risks they could encounter (Appendix A). In the relevant literature we explored before this research, no such information was available from empirical studies to allow anyone to investigate this association.

## **1.5 Grounding of The Thesis in Research Theory**

In this introduction chapter section we present how our study is grounded in literature with existing research theory.

Grounded Theory was created by two sociologists Barney Glaser and Anselm Strauss in their book "The Discovery of Ground Theory" (1967) which had three intended purposes:

- 1) Closing the gap between theory and empirical research
- 2) Explain the logic of the theory (which later Grounded Theory Method)
- 3) Helped Legitimize careful qualitative research

This work criticized Positivist approaches which were deductive and were speculative in nature. Grounded Theory does not aim at finding "the truth" [Allan G. 2003], but aims instead at conceptualizing what companies practice as captured by empirical research. The main experts in the practice of the domain of Grounded theory over 2000-2015 are Thornberg Robert and Charmaz Kathy.

The problems associated with delaying literature review until the end of the research process have been avoided by using literature in a constructive and data-sensitive way without forcing it on the data as advocated by Thronberg [Thornberg 2014].

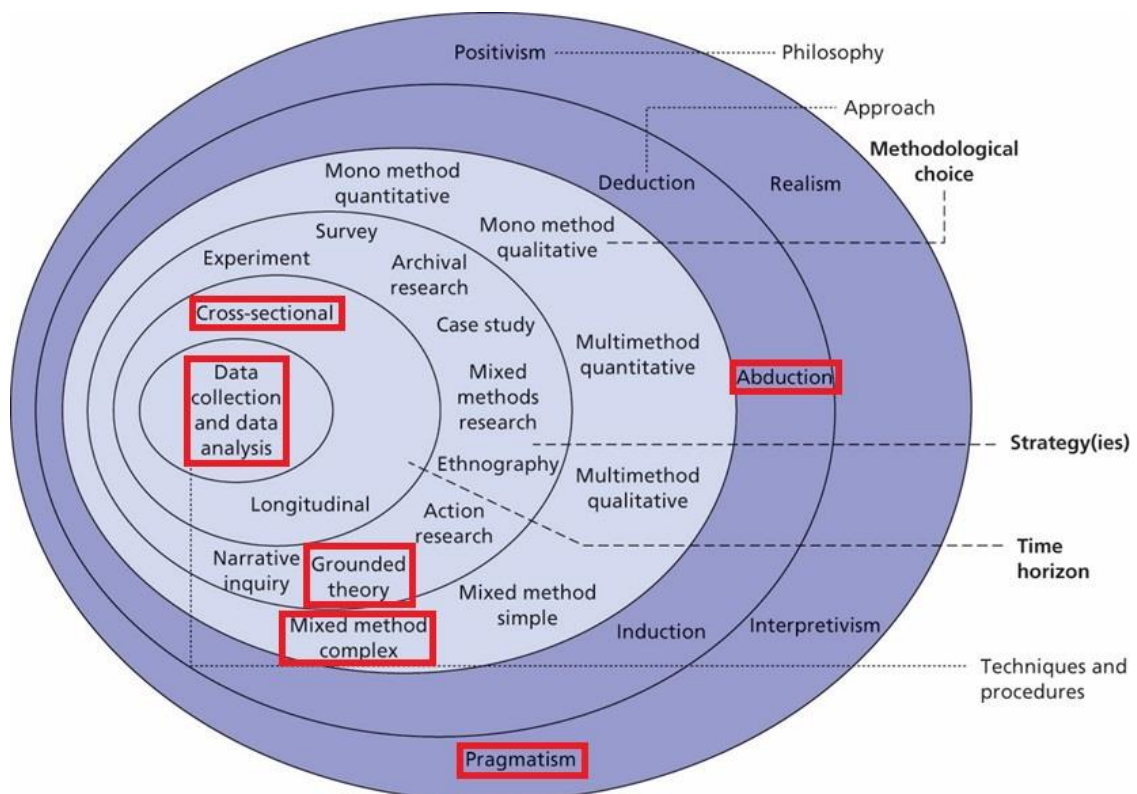
Today grounded theory it is commonly used in environmental studies [James P., 2012], to examine companies' preparedness needs through implementation experiences of the practitioners. It is also used in business studies [Kaufmann, L. et al 2011], by managers that examine organizational characteristics to make decisions.

This research uses what is known as "Constructivist Ground Theory" where data collected is influenced by the researcher's perspectives [Savin-Baden, et al. 2013]. It is being colored by the field knowledge, values, privileges, positions, interactions and general locations of the researcher. A sort of middle ground between the realists who examine just facts and the post-modernists who present opinions.



Hence, it is perfectly suited for our intent to examine companies preparedness needs for sustainable procurement through the implementation experiences of the practitioners, and even more suited for business studies by managers to add value for consumers where organizational characteristics can help explain decision making and continuous improvement.

Let us observe the Research onion to describe the approach used in this thesis, see figure 1.5 below:



**Figure 1.5:** The Research Onion According to Saunders, Source [Pearson 2012] Adapted (2015) by Richard LACROIX to illustrate the grounding of this research thesis in theory as indicated in Red.

The inner circles of the research onion describes the techniques and strategies used to develop a theory based on the philosophies of research (outer circle), hence moving from the data towards to development of a model. A concise definition of the concepts of this diagram as described in the explanation of all the layers are taken from, the glossary from Pearson Research Methods 6th Edition [Pearson 2014]. The bolded options correspond to the choices made to conduct this research as highlighted in red in Figure 1.5

### Onion Layer 1: Philosophy

**Pragmatism** A position that argues that the most important determinant of the research philosophy adopted is the research question, arguing that it is possible to work within both positivist and interpretivist positions. It applies a practical approach, integrating different perspectives to help collect and interpret data.

**Positivism** The epistemological position that advocates working with an observable social reality. The emphasis is on highly structured methodology to facilitate replication, and the end product can be law-like generalizations similar to those produced by the physical and natural scientists.

**Realism** The epistemological position that objects exist independently of our knowledge of their existence. See also critical realism, direct realism.

**Interpretivism** The epistemological position that advocates the necessity to understand differences between humans in their role as social actors.

### Onion Layer 2: Approach

**Abductive Approach Research** involving the collection of data to explore a phenomenon, identify themes and explain patterns, to generate a new - or modify an existing - theory which is subsequently tested.

**Deductive approach** Research approach involving the testing of a theoretical proposition by the employment of a research strategy specifically designed for the purpose of its testing.

**Inductive approach** Research approach involving the development of a theory as a result of the observation of empirical data.

### Onion Layer 3: Methodological Choice

**Mixed-Method Complex:** Uses both quantitative and qualitative data collection techniques and analysis procedures either at the same time (concurrent) or one after the other (sequential). **This involves the mixed-model research combining quantitative and qualitative approaches in other phases of the research such as research question generation** [Ramanathan, R. 2008]. **This study relied on triangulation** to compare where quantitative and qualitative data converge or diverge in relation to addressing the research questions.

**Mono-Method Quantitative:** Quantitative use of single data collection technique and corresponding analysis procedures.

**Mono-Method Qualitative:** Qualitative use of single data collection technique and corresponding analysis procedures.

**Multi-Method Quantitative Study:** Use of more than one quantitative data collection technique and corresponding quantitative analysis procedure or procedures.

**Multi-Method Qualitative Study:** Use of more than one qualitative data collection technique and corresponding qualitative analysis procedure or procedures.

**Mixed-Method Simple:** Use of both quantitative and qualitative data collection techniques and analysis procedures either at the same time (concurrent) or one after the other (sequential). This involves the mixed-model research combining quantitative and qualitative approaches in other phases of the research such as research question generation that are conducted concurrently during a single phase of data collection and analysis.

#### Onion Layer 4: Strategies

**Mixed Methods Research:** Use of both quantitative and qualitative data collection techniques and analysis procedures either at the same time (concurrent) or one after the other (sequential). The study in this thesis involves a combination of Experiment and Survey (with structured interviews) inside the domain of exploratory research using the Grounded Theory Methodology [Yancey P. et al 1986].

**Grounded Theory: inside the domain of Exploratory Research** Grounded Theory (Methodology) the research developed a theory (the model) from data collected by a series of observations (survey sample) and interviews principally involving an inductive approach per Thornberg [Thornberg, R. et al. 2011] (used).

Experiment: Research strategy whose purpose is to study the probability of a change in an independent variable causing a change in another, dependent variable. Involves the definition of null and alternative hypotheses; random allocation of participants to either an experimental group(s) or a control group; manipulation of the independent variable; measurement of changes in the dependent variable and; control of other variables (used).

Survey: Research strategy that involves the structured collection of data from a sizeable population. Although the term 'survey' is often used to describe the collection of data using questionnaires, it includes other techniques such as structured observation and structured interviews (used).

Archival research: Research strategy that analyses administrative records and documents as principal sources of data because they are products of day-to-day activities.

Case study: Research strategy that involves the empirical investigation of a particular contemporary phenomenon within its real-life context, using multiple sources of evidence.

**Ethnography:** Research strategy that focuses upon describing and interpreting the social world through first-hand field study.

**Action Research:** Research strategy concerned with the management of a change and involving close collaboration between practitioners and researchers. The results flowing from action research should also inform other contexts.

**Narrative Inquiry:** Qualitative research strategy to collect the experiences of participants as whole accounts or narratives, or which attempts to reconstruct such experiences into narratives.

#### Onion Layer 5: Time Horizon

**Cross-sectional:** The study of a particular sustainable procurement phenomenon (or phenomena) at a particular time, i.e. a 'snapshot'.

**Longitudinal:** The study of a particular phenomenon (or phenomena) over an extended period of time.

#### Onion Layer 6: Techniques and Procedures

**Data Collection and Data Analysis:** Used Grounded Theory Method Data collection techniques (standard stratified sampling technique) and analytic procedures (used in a Grounded Theory research strategy) to derive meaning from the subjects and settings being studied.

Table 1.5 describes the stages and purpose as required by the Grounded Theory Methodology best practices [Thornberg 2014]. This table was created by Richard-Nicolas LACROIX to demonstrate conformity and correspondence of the operational model results at every stage of the research according to the Grounded Theory Methodology.

Stage	Purpose	Operational Model
Codes	Identify anchors to allow gathering of data key points (independent variables identified by interview with experts)	V1 Environmental Policy V2 Managerial Attitudes towards SP V3 HR Attitudes towards SP V4 Believes in Values of SP V5 HR Sensitivity through training towards SP (training skills, education knowledge, development attitude) V6 Supplier Alignment with SP policy V7 Supplier Sensitivity through training towards SP V8 Company Innovates SP products and Procedures V9 Third Party validation of company SP claims V10 SP indicators and Measurements for performance assessment V11 TQM best practices for SP innovation V12 Cooperation with competitors and partners for standards creation V13 R&D Procedures to develop and implement SP ideas.
Concepts	Collection of Codes of similar content to allow data grouping (4 areas of questionnaire)	Nominal Variables [example respondent position 1(CEO, Owner, General Manager), 2(TQM SCM Logistics, Procurement), 3(Sales and Marketing & HR), 4(Finance), 5(other)] + Tactical Lickert-5 Variables & to produce stratified data [Example having Tools and Metrics].
Categories	Broad groups of similar concepts allow the creation of a theory	Concepts of Added Value, TQM Culture, Investment in SP, Training, Supplier Conformity, etc. Funnel Categories of Deming PDCA cycle + Top

	(independent factors + variable loading from regression analysis)	Management process on sustainable procurement decision making (large companies focus more on strategy than implementation, small on implementation and less on strategy)
Theory	A collection of categories that detail how sustainable procurement is practiced by companies. (Hypotheses testing + inductive theory Principle Component Analysis (PCA) under which 7 Independent Factors are extracted).	<p>Funnel model for SMEs &amp; constructivist ground theory of Map of how Countries implement sustainability demonstrating Geography influence of decision making – need to explore culture influence in future research</p> <p><u>Seven Independent Factors Extracted:</u></p> <p><b>Factor1a: Innovation and Measurement</b> (Cronbach <math>\alpha</math> = ,812 Items = 5)</p> <p><b>Factor1b: Company Sustainable Profile</b> (Cronbach <math>\alpha</math> = ,755 Items = 4)</p> <p><b>Factor1c: Company's Positive Sustainable Image</b> (Cronbach <math>\alpha</math> = ,635 Items = 3)</p> <p><b>Factor1d: Supplier Sustainability Management</b> (Cronbach <math>\alpha</math> = ,604 Items = 2)</p> <p><b>Factor 2a: Customer's Driven Packaging Label</b> (sustainability impact) (Cronbach <math>\alpha</math> = ,894 Items = 8)</p> <p><b>Factor 2b: Implementation of SVP Strategy</b> (Cronbach <math>\alpha</math> = ,832 Items = 5)</p> <p><b>Factor 2c: SVP Customer Value</b> (Cronbach <math>\alpha</math> = ,617 Items = 4)</p>

**Table 1.5:** Conceptual and Operational Model of the Cross Section Research of Western – European Food and Beverage Companies practicing Sustainable Procurement in 2012. Source: Richard-Nicolas LACROIX © 2015.





## 2. Relevant Quality Standards

Large, middle and small food and beverage companies across Western Europe and Switzerland distinguish themselves for the quality of their products and services, a reputation that they have earned with their customers to whom they offer value through quality and warranties regarding the origin of the products, the methods of production (traditional etc), the benefits (taste, health benefits, ingredients, time saving, etc.) most of which are derived from adherence to legislation about health and safety of the ingredients and processes (mostly through HACCP and ISO 22000) and ISO or other quality standards offering some sort of comfort to consumers that things are done right. The information relative to HACCP and ISO 2200 as well as ISO 14001 and EMAS standards can be found in Appendix G.

There are three subsections in that appendix, namely:

G.1 European Food Safety

G.2 HACCP, ISO Standards (9000, 22000, 14001 & EMAS )

G.3 Risk Management

This chapter will discuss exclusively the underlying standards which apply to our domain of research of sustainable procurement (BS 8903: principles & framework for procuring sustainability) from information publically available at [www.actionsustainability.com](http://www.actionsustainability.com) and which will be discussed briefly here so as to provide some background as to the requirements for companies operating in Western Europe with regards to HACCP and Food and Beverage best practices used by some of the best in class of the sampled companies which participated in our research.

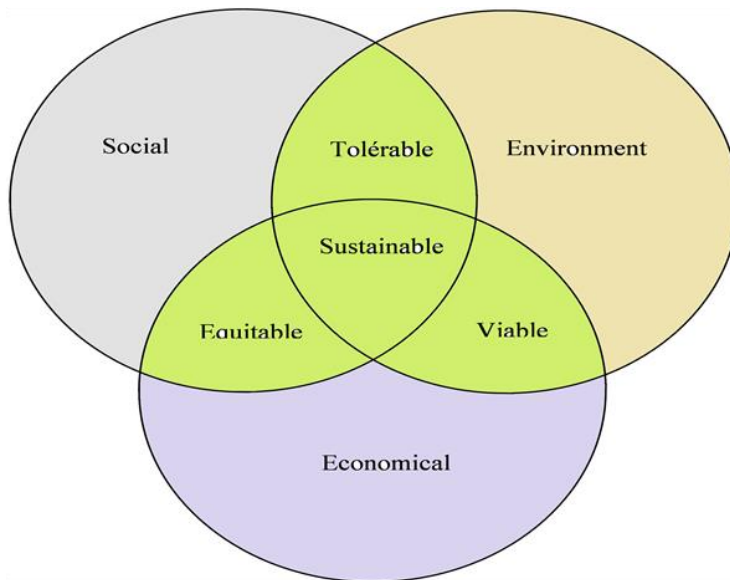
### **BS 8903: principles & framework for procuring sustainability**

According to [www.actionsustainability.com](http://www.actionsustainability.com) “BS 8903 is the world's first standard for sustainable procurement - BS 8903: Principles and Framework for Procuring Sustainably was launched in summer 2010 » and « provides guidance to any size and type of organisation on adopting and embedding sustainable procurement principles and practices». This standard which was submitted to the ISO organization for the creation of a future ISO standard on « Sustainable Procurement » [<http://www.actionsustainability.com/bs8903/>]. It covers all stages of the procurement process and is applicable across industry, public, private and third sector organisations. This standard has been used successfully in the last 4 years by many of the UK food and beverage companies which we surveyed and interviewed. We describe below a summary of the standard.

#### What is sustainable procurement according to BS 8903 ?

The next eight pages are reproduced with acknowledgement to the source ([www.ecobuy.org.au](http://www.ecobuy.org.au)) as taken from the standard mentioned earlier [<http://www.actionsustainability.com/bs8903/>]. « Sustainable procurement means only purchasing goods that are really needed and buying items or services whose production, use and disposal both minimise negative impacts and encourage positive outcomes for the environment, economy and society. It can be defined as “a process whereby organisations meet their needs for goods, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment.” (Procuring the Future, 2006). Sustainable procurement should consider the environmental, social and economic consequences of design, non-renewable material use; manufacture and production methods; logistics; service delivery;

use; operation; maintenance; reuse; recycling options; disposal and suppliers' capabilities to address these consequences throughout the supply chain (Figure 2.1). Sustainable procurement is good procurement and should not be viewed as an abstract, idealist goal but as a practical and achievable objective for all organizations" ([www.ecobuy.org.au](http://www.ecobuy.org.au))



**Figure 2.1:** Balancing Sustainable Procurement

“WHAT ARE THE AIMS OF SUSTAINABLE PROCUREMENT?”

([www.ecobuy.org.au](http://www.ecobuy.org.au))

**Minimising any negative impacts** of goods, works or services across their life cycle and through the supply chain (e.g. impacts on health or air quality);

**Ensuring that fair contract prices and terms are applied and respected** and that minimum ethical, human rights and employment standards are met;

**Providing opportunities for small and medium sized businesses,** voluntary sector organisations and also supporting jobs, diversity, training and skills development;

**Minimising demand for resources** (e.g. by reducing purchases).

WHAT ARE THE PRINCIPLES OF SUSTAINABLE PROCUREMENT?

**A sound approach;** sustainable procurement is good procurement, based on fairness, openness and transparency, non-discrimination and competition.

**An ethical approach;** sustainable procurement should ensure integrity, encourage diversity and avoid corruption.

**A holistic approach;** sustainable procurement should consider the effects of procurement decisions on quality of life, environment and society in general.

**A risk/opportunity-based approach;** sustainable procurement should adopt an ongoing process of continual improvement.

**Leadership;** senior level leadership is needed for success although this can come from all levels within an organization.

**Delivery of organizational objectives;** sustainable procurement can deliver against a wide range of objectives beyond financial and efficiency savings.

#### WHY PROCURE SUSTAINABLY?

**Financial drivers;** including delivering operational cost savings through more efficient goods, works and services; challenging demand at source; reducing end-of-life disposal costs, driving efficiency in the supply chain, and developing market capacity, innovation and competitiveness.

**Risk;** includes legal risks, financial liabilities, moral/ethical risks, security of supply risks, price volatility risks and risk to reputation and license to operate risks.

**Organization policy commitments and targets;** are an expression of the culture, values and business ethos by which an organization operates. This should be supported by procurement and reflected in procurement policy, strategy objectives, business practice and decision making.

**Stakeholder expectations and awareness** are increasing, which is putting greater pressure on organizations to consider the environmental and social aspects of business and to implement sustainable initiatives.

**Marketing** is a driver about procuring goods, works and services with enhanced environmental or social credentials to either drive more sales or derive a positive image for the organization.”

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HOW TO PROCURE SUSTAINABLY? “ ([www.ecobuy.org.au](http://www.ecobuy.org.au))

## FUNDAMENTALS

A robust sustainable procurement system is dependent on a solid commitment by the organization. This relationship is illustrated by Figure 2.2, which forms the core of the sustainable procurement process diagram. The first step is to ensure the organization has a clear, written statement as to the organization’s overall values, mission and strategic goals – organizational policy. This should include what sustainability means to the organization.

The organization policy should be supported by a sustainable procurement policy and strategy statement to ensure commitment at all levels.



**Figure 2.2:** Procurement Fundamentals

The sustainable procurement policy and strategy statement should:

- Be aligned with the organizational drivers for sustainability;
- Be informed by an initial high-level sustainable procurement risk and opportunity assessment;
- Capture the economic, social and environmental considerations;
- Identify the key sustainable procurement targets, objectives and measures required to deliver the policy;
- Be endorsed or led by senior management;
- Be communicated to all staff, key suppliers and other key stakeholders; and
- Be clear, concise and well-documented

“BS 8903 PROCUREMENT PROCESS” ([www.ecobuy.org.au](http://www.ecobuy.org.au))

The procurement process is circular and made up of seven steps. These are outlined below and portrayed in Figure 2.3, which forms the 7 stages of the sustainable procurement process diagram.



**Figure 2.3:** BS8903 Sustainable Procurement Seven Steps Process Stages

**STEP 1 IDENTIFY BUSINESS NEED** Identify the need and the business requirement for the purchase and whether or not the purchase is actually necessary. This must be done in the context of the organizational policy and the sustainable procurement policy and strategy statement. Once a requirement has been identified:

- The first consideration is resourcing the procurement project. It is important that the team involved have the appropriate skills and understanding of the sustainability requirements.
- Identify all key internal and external stakeholders and decisions should be taken on how best to engage with them throughout

the project.

- Ensure business requirements are aligned with relevant strategic objectives and challenge those requirements to reduce demand.
- Buyers should consider risk, including sustainability related risks and impacts, throughout the procurement process.

**STEP 2 DEFINE SOURCING STRATEGY** Market research may be required before all the purchasing options can be defined depending on the size and scale of the purchase.

- Research should be encouraged to promote creativity and determine if new technologies, new products, new innovative suppliers or advances in sustainable business practices could meet the business need.
- Select procurement tools that can be employed for a structured approach to comparing impacts, e.g. life cycle assessment, carbon measurement, whole life cost analysis, risk and opportunity analysis and weighted decision making.
- Incorporate sustainability criteria into the procurement specification. This is the most effective means of ensuring sustainable aspects are incorporated into the purchasing decision. Specification should be based on the research conducted into impacts and alternatives and may include minimum requirements or preferred attributes.

**STEP 3 IDENTIFY SUPPLIERS AND TENDER** Once an approach and specification is finalized and agreed by all key stakeholders the next step is to identify potential suppliers or contractors to invite to tender.

- Keep the process simple and brief to encourage SMEs and local enterprises to take part. • The tender should be issued only once all bid evaluation criteria, scoring methodology and benefit assessments are agreed.
- Often pre-qualification takes place prior to going to tender. This involves vetting potential suppliers of goods and services to identify those able to meet minimum standards, including operational environmental management and social responsibility. The prequalification may be done by a simple questionnaire, by supplier site visits or by supplier presentations or other

means or a combination. Suppliers that are unsuccessful at the pre-qualification stage should be notified.

**STEP 4 EVALUATE AND AWARD** Once the tenders are returned the next step is to evaluate them and award the contract.

- All tenders should be evaluated and scored in line with published criteria that take into account sustainability.
- Buyers may audit their suppliers and prospective suppliers at different points across the purchasing process, especially for key contracts. However, as this is typically a costly and resource intensive activity it is often performed once the supplier or suppliers have been shortlisted.
- There may be opportunities to negotiate additional improvements through contract clauses or a separate plan or commitment. Suppliers are typically very responsive at this stage and it is an opportunity to agree on future targets.
- On completion of the negotiations the supplier is formally awarded the contract, which should be fully approved by the necessary stakeholders and the wider stakeholder community should be informed of the new arrangements.
- Unsuccessful suppliers should be formally notified in a timely manner and debriefed on their performance including sustainability.

**STEP 5 IMPLEMENT** There is a period of transition and bedding in at the start of any new contractual arrangement and frequently the influence and involvement of stakeholders change as the contract becomes operational.

- The supplier review process, key measures and measurement methodology of contract terms should be finalized and agreed as part of the contract management plan.
- A supplier performance improvement plan which integrates sustainable measures and targets should be finalized and jointly agreed.

**STEP 6 MANAGE PERFORMANCE AND RELATIONSHIP** Ongoing performance monitoring is essential throughout the contract to ensure that the supplier continues to deliver in accordance with the specification, contract



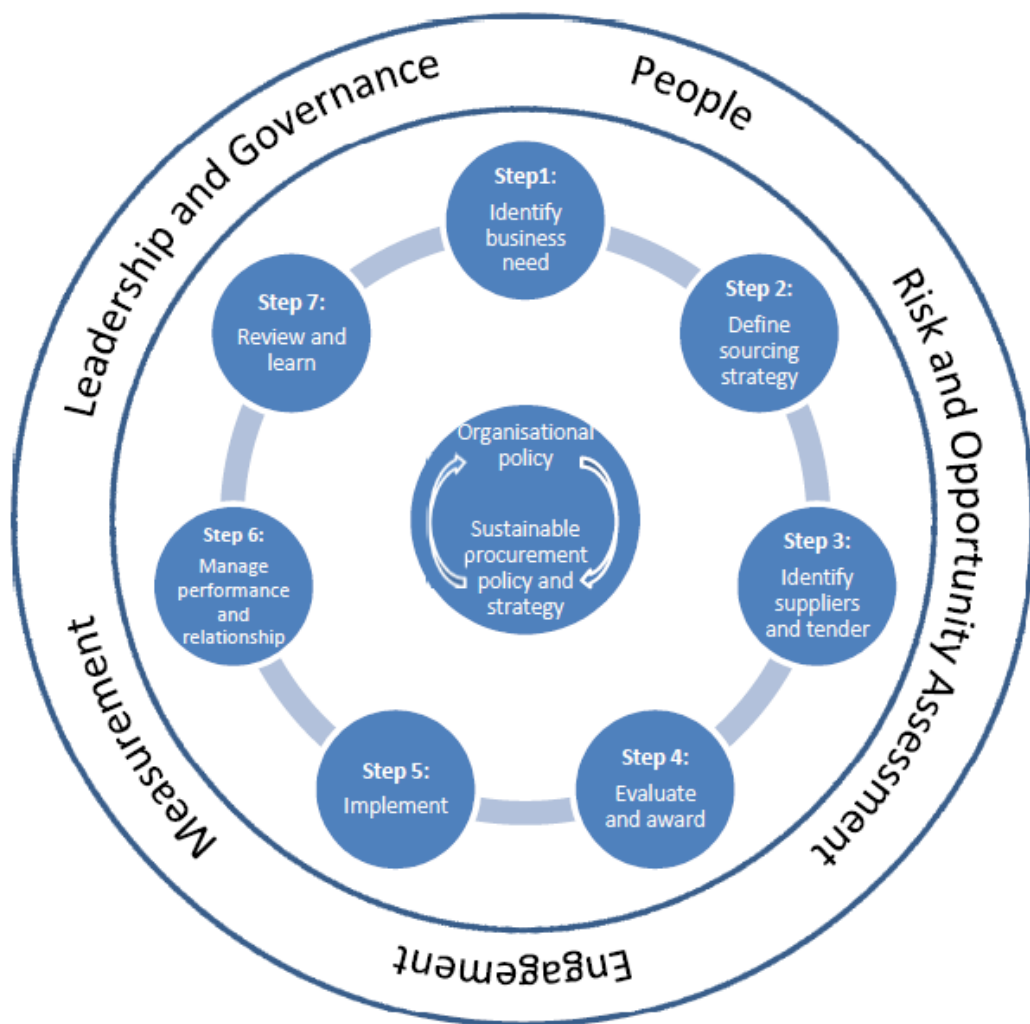
terms and/or separate performance improvement plans.

- Positive customer-supplier relationships enable addressing sustainability issues as they arise and championing initiatives that were not included in the contract originally. Two-way communications also allow joint performance improvement and help harness valuable supplier expertise.
- Balanced scorecards may be used to track sustainability along with other measurements and performance addressed when it falls below the set threshold.
- As a last resort and in extreme cases it might be necessary to exit a relationship where the supplier has failed to make the required sustainability improvements.
- Non-consumable goods require disposal strategies to be developed for the end of their useful life. This eventual need should be considered throughout the procurement process.

**STEP 7 REVIEW AND LEARN** Continuous improvement is the cornerstone of good procurement practice. Buyers should ensure that processes are in place to allow review and feedback of key projects and purchases to ensure learning is captured, shared and acted upon. This should be an ongoing process and buyers do not need to wait until the end of the procurement cycle to commence this.

#### ENABLERS ([www.ecobuy.org.au](http://www.ecobuy.org.au))

These include ways of working, competencies, practices and techniques that support the activities within the sustainable procurement process. These enablers should be in place and utilized by managers or buyers on an ongoing or periodic basis. They also form the outer ring of the sustainable procurement process diagram in Figure 2.4.



**Figure 2.4:** BS 9903 Sustainable Procurement Process Diagram & Enablers

LEADERSHIP AND GOVERNANCE Sufficient management support and endorsement is the first enabler of sustainable procurement. Leadership can occur at all levels but senior level endorsement is needed if sustainable procurement is to become embedded in an organization's ethos. Governance is concerned with whether there are the right systems, structures and controls in place to ensure that sustainability is considered and resourced throughout purchasing and the wider organization. Accountability is also important, it should also be clear as to who is accountable for ensuring the sustainability for a particular purchase, project or for delivery of key objectives. In summary good leadership and governance should ensure a consistent and cohesive approach to sustainability which is reflected in an organization's processes and decision making.

PEOPLE all staff and stakeholders that have an influence over purchasing decisions need to be sufficiently competent and understand both the reasons for implementing sustainable procurement and their role in making it happen. Training and development may be required which may extend to first-tier suppliers and key suppliers further down the supply chain and key internal stakeholders.

RISK AND ASSESSMENT Procurement staff must have the basic skills needed to identify, quantify and then manage potential sustainability risks and opportunities. There are many techniques that may be used to assess risk and once identified these should be prioritized and addressed according to size of risk, scope to improve and influence. Risks and opportunities should be managed throughout the life of a contract with processes embedded in the organization and not just considered at a single point in time.

ENGAGEMENT Communication and building positive relationships both internally and externally are key to ensuring understanding and buy-in of sustainability efforts. This should also involve educating suppliers on how to adopt sustainability into their own operations.

MEASUREMENT Tracking the results of procurement initiatives against the baseline provides a picture of what the organization has accomplished. Measurement is typically applied to two areas: management indicators (qualitative) and operational indicators (quantitative). Management performance is judged on the practices in place, and can be scored based on the DEFRA Flexible Framework (or ECOBuy's online Sustainable Procurement Assessment Tool). Operational indicators tend to be more focused on the actual outcomes of sustainable initiatives such as energy reductions.

This section of the thesis is meant as a summary and quick reference for the BS 8903 Principles and Framework for Procuring Sustainably. It is not intended as a replication or re-writing of the standard. Permission to reproduce extracts from BS 8903:2010 is granted by BSI. British Standards can be obtained in PDF or hard copy formats from the BSI online shop: [www.bsigroup.com/bs8903](http://www.bsigroup.com/bs8903) or by contacting BSI Customer Services for hardcopies only: Tel: +44 (0)20 8996 9001, Email: [cservices@bsigroup.com](mailto:cservices@bsigroup.com).



### 3. Literature Review

#### 3.1 Literature Review Introduction

In order to explore our theme in 2010, we performed a systematic search of Journal, Conference papers and Books on “**sustainable procurement**” with the help of the VPN search engines available through the Library of the University of Piraeus, Greece. This process was again repeated in 2014 after the conclusion of our Survey data collection, to see if there were any newer / “more recent” and relevant updates in literature that changed or confirmed in interpreting the data which we collected from the survey and follow up interviews with the thought that this new literature could help us better explain trends and assist with interpretations when we analyzed / explained the data. Finally in January 2015, a new literature check was performed for verification purposes at the time of finalization of this thesis for possible errors and significant relevant omissions.

The literature search performed was rigorous and utilized a “top-down” process as discussed in the next sub-section.

### 3.2 Literature Review Guidelines Followed

This review focused on searching for relevant articles predominantly in the English language academic literature, to find evidence to answer the research question. A review panel of two professors contributed to the approach, criteria and search words to enable the inclusion and exclusion of articles.

<i>Research questions</i>	<b>Characteristics of SP in Large, Medium and Small private sector companies.</b>	<b>Factors impacting SP in private sector companies</b>	<b>Key Dimensions of SP Models in Large, Medium and small private sector companies</b>
<i>Strategy to Locate evidence</i>	<b>Search Engines</b> (Blackwell Publishing, Business Source Elite, Emerald, Kluwer, Science Direct) <b>and Proceedings</b> from Supply Chain Management (SCM)/SP conferences		
<i>Criteria for Inclusion</i>	<p><b>Main Fields:</b> Sustainable Procurement (SP), Operational management, SCM, Organizational Management, Performance measurement, Best Practices, SMEs</p> <p><b>Included Topic:</b> SP SMEs</p> <p><b>Typology:</b> Academic Journals, conference proceedings and internal reports</p> <p><b>Research Methodology:</b> Empirical Research</p>	<p><b>Main Field:</b> SP &amp; Performance Measurement</p> <p><b>Included topic:</b> SP Model &amp; Characteristics</p> <p>Excluded Topic Pre-2008 studies</p> <p><b>Typology:</b> journal paper</p> <p><b>Research Methodology:</b> Empirical Research</p>	

**Table 3.1:** Top-down Literature Review Process

A structured literature review was conducted focusing on leading journals Databases as listed alphabetically in Table 3.2.

<b>Management and Environmental Journals</b>	<b>Operations, Supply Chain and Sustainable Procurement Journals</b>
Academy of Management Journal	International Journal of Business Performance Management
Business Strategy and the Environment	International Journal of Physical Distribution and Logistics
Corporate Social Responsibility and Environmental Management	International Journal of Production Economics
Greener Management International: The Journal of Corporate Environmental Strategy	International Journal of Production and Operations Management
Harvard Business Review	International Journal of Production Research
International Journal of Life Cycle Assessment	Journal of Operations Management
Journal of Environmental Economics and Management	Journal of Purchasing and Supply Management
Journal of Management Studies	Management Journal of Supply Chain Management
Management Science	Omega: The International Journal of Management Science
Sloan Management Review	Supply Chain Management: an International Journal

**Table 3.2:** List of Journals searched from the fields of Management, the Environment, Operations, Supply Chain and Sustainable Procurement fields.

A two-step literature review process was performed to identify and reduce sources. We used sophisticated engine keyword and flag combinations searches for the periods 2007-2011 (prior to creating our hypotheses) but included older valuable references and again in early 2014 for the periods 2009-2014 so as to ensure that latest post survey references and developments would not be left out from our analysis.

### 3.3 Findings from Literature Review prior to 2011

In addition to the previously mentioned articles we included those with keywords such as green purchasing and procurement, green or environmental Supply Chain Management (SCM), sustainable SCM; corporate social responsibility (CSR) in supply chains, sustainability and Small to Medium sized Enterprises (SMEs) and excluded references to "public" procurement.

This data search process identified over 38000 references: 26600 of these on sustainable procurement. 15500 of the results related to SMEs and 14200 referred to "public" procurement. We chose to exclude these last so as to focus only on the remaining 1300 sources for non-publicly owned "private" SMEs. This last retained category corresponds to about 300 per year on average that are adequate for further exploration. We estimate to see another 100-200 relevant articles published on the subject in 2014 (we found out in 2015 that these totaled 77 new articles). Five people participated in that article selection process: 2 professors, one researcher and two post graduate students. We used a two-step data reduction procedure to retain only essential information. First the team excluded non-pertinent articles e.g. on Life Cycle Assessment (LCA) (see Table 3.3). Second we included relevant articles based on the preliminary analysis of their abstracts. In 2011, we analyzed 650 abstracts and in 2014 another 1300, all were equally dived-up amongst the team for analysis and further recommendation as to their use.

Sources Evaluated	Exclusion Criteria
Book reviews, letters	Not pertinent
Ecological / Ethical perspective	Articles with highly ecological or ethical content as opposed to purchasing and supply
From other journals	Literature review needs to be kept focused
Logistics	Too many studies on greening logistics



Technical works	Life Cycle Analysis, inventory, pollution prevention recycling, energy & water conservation, e-procurement. Too specific for inclusion.
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**Table 3.3:** Criteria for exclusion from the Literature Review.

### 3.4 Summary of Literature prior to 2011 Based on Two Better Articles.

In 2011, we identified a few interesting articles which provided a preliminary direction which encompassed the wording “literature review” in their title. These were the following two:

Walker, Susan “**Sustainable procurement: a literature review**” (2009) as published in the proceedings of the 18<sup>th</sup> IPSERA conference on Supply Management – Towards an Academic Discipline? 5-8 April 2009.

The author while focusing on sustainable public procurement found that businesses that engage in sustainable procurement tend to perform better. This article posed the question as to how future research might explain how a recession could affect sustainable procurement and how sustainable procurement policy fits with SME agenda and sustainability issues in global supply chains.

Walker, Susan and Phillips Wendy, “**Sustainable Procurement: Emerging Issues**” (2006) International Public Procurement Conference Proceedings 21-23 September 2006.

The authors explain how the balancing of environmental, social and economic objectives can be achieved through the purchasing and supply process. This article presents the results of a workshop involving a focus group of 44 participants from the public and private sector discussing 4 topics: 1) moving from environmental focus to a social and economic objectives, 2) sustainability and innovation, 3) ethical supply issues, and 4) measuring the impacts of sustainable supply.

The authors mention the phrase “sustainable procurement” does not occur frequently in academic literature but has a variety of related terms:

**Green supply** (Bowen, Cousins, Lamming, & Faruk, 2001a, 2001b)

**Green purchasing** (Chen, 2005; Min & Galle, 2001; Ochoa, Fuhr, & Gunther, 2003)

**Green purchasing and supply strategies** (Green, Morton, & New, 1998)

**Environmental purchasing** (Carter & Carter, 1998; Carter, Ellram, & Ready, 1998, Carter, Kale, & Grimm, 200; Legarth, 2001; Murray & Cupples, 2001; Zsidisin & Siferd, 2001)

**Environmental supply chain management** (Lamming & Hampson, 1996; Naramsimhan & Carter, 1998),

**Green supply chains** (Klassen & Johnson, 2004; Rao & Holt, 2005; Walton, Handfield & Melnyk, 1998),

**Green value chains** (Handfield, Walton, Seegers, & Melnyk, 1997)

**Green supply chain management** (Sarkis, 2003; Zhu, Sarkis, & Geng, 2005) and

**Environmental supplier performance** (Humphreys, McIvord, & Chan, 2003; Noci, 1997).

The papers mentioned above focused primarily on the “environmental aspect” and economic objectives receiving more attention recently. A link was found between public procurement and social outcomes (McCrudden, 2004) and more articles on **corporate social responsibility** (CSR) (Carter, 2005; Carter & Jennings, 2002) and **socially responsible buying** (Drumwright, 1994; Maigan, Hillerbrand, & Mcalister, 2002) and Sourcing (Henkle, 2005).

The majority of articles relate to the private sector.

Worthy to mention are articles on:

**Sustainable consumption** (Lovins & Lovins, 2001)

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**Sustainable food chains** (Ilbery & Maye, 2005)

**Sustainable development in business strategy** (Lamming, Faruk, & Cousins, 1999) and

**Sustainable procurement** (Walker, Bakker, knight, Gough, & Mcbain, 2006).

### **3.5 Definitions as Found in Literature prior to 2011.**

#### 3.5.1 Definition of SMEs

SMEs are defined either by their balance sheet or the number of their employees (Eurostat, 2014). In this article, we use the official European Commission definition with the predefined boundaries on employee count and annual revenues focusing on companies with less than 250 employees with a balance sheet not exceeding 50 million Euros.

#### 3.5.2 Concept of Performance Measurement

Performance Measurement is the means by which SMEs establish criteria which will help them measure and evaluate the performance and the quality of their activities based on pre-set organizational goals (Hall, 2013). The Business dictionary states this concept became very popular in 1982 after the publication of "In Search of Excellence" by Tom Peters and Bob Waterman, which describes the best practices of successful companies that collect information to measure production, demand and operating efficiency to assist decision makers (<http://www.businessdictionary.com>).

The Academic literature shows that SMEs are improving their capabilities in view of the complexities of the market; their management culture is improving, and they lack the technology to support decision making (Bernardi and Biazzo, 2003).

SME tends to have insufficient processes. SME's employees predominantly learn with on the job training. The success of an SME is believed to relate to its flexibility to change and quick decisions of its managers. Large companies,

in contrast with SMEs, focus more on performance measurement (Taticchi, Balanchandran, Botarelli & Cagnazzo, 2008). There is little research on that subject (Hudson, Smart & Bourne, 2001). Garengo, Biazzo & Bititci (2005) state that 25% of performance models used concern SMEs while the remainder 75% are for large companies.

Jamil and Mohammed (Jamil and Mohammed, (2011) state that all performance measurement models used by SMEs have internal issues (costs, production factors, activities, products and revenues) - to monitor the production process) and external issues (financial performance and competitiveness) - to measure performance. The whole of these measures support decision making and quality and sustainability. (Jamil and Mohammed, 2011).

### 3.5.3 Concept of Sustainable Procurement

The Benefits of sustainable procurement vary from company to company but those from our survey who chose to implement sustainable procurement did so for various reasons, which included:

- Increased sales from greener food and beverage products
- Support for sustainability strategy and vision
- Improved, image, brand & market differentiator
- Customer perceived health benefits from greener food and beverage products or traditional or bio or organic labeled products
- Conservation and Savings of energy, fuel, water and other resources
- Cost avoidance with lower waste management and improved packaging
- Compliance with environmental regulations

Sustainable Procurement also known as "Green Procurement" (Lacroix R., 2010a) is "using procurement of suppliers and processes to deliver long-term social, economic and environmental value for products and services" (Lacroix R. et al. 2014). Sustainable procurement now requires suppliers to understand the sustainability drivers that SMEs are specifying in their procurement decision making (Lacroix R. et al, 2012). Most leading suppliers now publish

their sustainable procurement objectives. In spite of the challenges in SP most firms seem to uncover and to exploit new opportunities (Lacroix R. et al. 2010), (Lacroix R. et al. 2012).

It is now widely accepted that organizations who have successfully implemented sustainable procurement practices adopt a good procurement practice (Gonzalez-Benito, O. 2005), (Lacroix R. et al. 2011).

According to Helen Walker (Walker et al. 2009), the first major milestone in identifying the principles of sustainable procurement was reached in 2005 when a private sector led Procurement Task Force in the UK created the report "Procuring the Future" (UK National action plan for Sustainable Procurement, 2005). This particular report listed 5 phases for the initial implementation and the "Flexible Framework (tool)" created to evaluate the maturity of firms. With major revisions, it was published by BSI in 2010 as British Standard – "BS8903: Principles and framework for procuring sustainably" as described earlier in chapter 2. The specific standard is very generic and is not widely used outside of the UK. Our proposed implementation maturity evaluation model is discussed further.

A number of special issues on sustainable procurement have been published according to Walker Helen (Walker, H. 2009) such as "in the Journal of Operations Management entitled 'Supply chain management in a sustainable environment' (Jayaraman, Klassen, & Linton, 2007). By the mere variety of articles published in various journals, we see this area of research is important and timely for the academic community. Some examples include: In Supply Chain Management: an International Journal 'Corporate Social Responsibility in the Supply Chain' (Lindgreen, Maon, Swaen, & Vanhamme, 2008), and in 'Sustainable supply chain management: Theory and Practice' (Pagell, Krause, & Klassen, 2008).

Let us refer to two interesting articles from Walker Helen for illustration of definitions.

The first entitled "Sustainable procurement: a literature review" (Walker, H. 2009) with complete literature coverage, where she refers to (Pagell, Krause &

Klassen, 2008), (Seuring, Muller, Rao & Sarkis, 2006), and (Carter, 2005).

The second "Greening Operations Management: An Online Sustainable Procurement Course for Practitioners" (Walker H. et al. 2008) where the authors explored suggestions to assist procurement professionals in "greening the purchasing and supply processes."

Implementing sustainable procurement processes has become an opportunity for many SMEs to create an infrastructure to support the Total Quality Management (TQM) processes and improve operations efficiency and expose any gaps between the SMEs objectives and observed performance. Some authors (Hudson et al. 2001) suggested that sustainable procurement becomes a driver for the SME, as in any performance measurement system to set objectives and deploy processes, verify results and make adjustments as in best of class quality cultured large companies.

### **3.6 The Business Case for Corporate Sustainability (BCS)**

The literature review search identified 254 relevant articles, 171 in the period 2001-2011 and another 83 articles for the period 2012-2015, with 15 articles per year on average with a peak of 24 articles in 2010 and of 34 in 2012 and a steady decline to 25 in 2014, 3 being registered so far for 2015.

Before embarking on some research on sustainable procurement, while nobody disagrees on the health and ethical benefits of preserving the environment for future generations, from a business standpoint besides pleasing customers, there has to be a business case for companies that the investment in sustainability is profitable so as to justify the return on the investment. While the majority of articles prior to 2000 discussed the need to preserve the environment without making a business case (Sanjay Sharma, 2000), the plethora of books and articles to that effect since 2001 seem to be unsure that there is a business case that companies investing in sustainability are profitable (Dyllick, T. and Hockerts, K. (2002); Christopher Laszlo, (2008); Charles O. Holliday, Stephan Schmidheiny and Philip Watts (2002). The most

interesting article that is cited over 1100 citations is Salzmann O., Ionescu-somers A. and Steger U., (2005). Let us quote some paragraphs from this excellent paper. The authors reviewed past “(1) theoretical frameworks, (2) instrumental studies aiming to either prove or disprove a hypothesized causal sequence between corporate social or environmental performance and financial performance, (3) descriptive studies examining manager’s actual perceptions and practices, and finally (4) tools” (Salzmann 2005).

The authors categorize “Research on the BCS into two general categories: theoretical studies and empirical studies. The theoretical studies are based on frameworks that aim to explain the nature of the relationship between financial performance (FP) on the one hand and environmental performance (EP) or social performance (SP) on the other. The empirical studies follow two lines of research: instrumental studies aim to empirically test the relationships hypothesized in theoretical studies; descriptive studies are intended to examine how companies and managers approach the BCS in practice” (Salzmann 2005).

### **Theoretical Studies:**

According to <http://www.f2.washington.edu>, the authors refer to “the relationship between financial performance (FP) and environmental/social performance (ESP). The frameworks differ in terms of the hypothesized causal sequence and the direction of the relationship” (see Table 3.4 below) (Salzmann 2005).

**Table 1 Typologies for ESP-FP Relationship—Based on Preston and O’Bannon (1997, p. 422)**

Causal sequence	Direction of the relationship		
	Positive link	Neutral link	Negative link
ESP leads to FP	Social impact hypothesis	Supply and demand theory	Trade-off hypothesis
FP leads to ESP	Available funds hypothesis or slack resources theory	of the firm	Managerial opportunism hypothesis
ESP and FP are synergistic	Positive Synergy		Negative synergy

Table 3.4 Typologies for ESP-FP Relationship

The authors compare the different frameworks in Tables 3.5 to 3.7 (Preston and O’Bannon, 1997).

**Table 2 Frameworks Suggesting a Negative Link between FP and ESP**

Framework	Description	Empirical evidence
<b>Trade-off hypothesis</b> (Friedman, 1962): <i>Higher ESP leads to lower FP</i>	Reflects Friedman's neoclassical argument that firms have only one social responsibility, which is to increase profits. By increasing ESP, they unnecessarily incur costs and reduce their profitability.	Vance (1975)
<b>Managerial opportunism hypothesis</b> (Preston and O'Bannon, 1997): <i>Higher FP leads to lower ESP</i>	Managers will reduce expenditure on ESP when FP is strong to maximize personal compensation (which is tied to short-term FP).	Posner and Schmidt (1992) and Alkhafaji (1989)
<b>Negative synergy</b> (Preston and O'Bannon, 1997)	Simultaneous relationship combining trade-off and managerial opportunism hypothesis.	

Table 3.5 Frameworks suggesting negative FP and ESP link

**Table 3 Frameworks Suggesting a Neutral Link between FP and ESP**

Framework	Description	Empirical evidence
<b>Supply and demand theory of the firm</b> (McWilliams and Siegel, 2001): No link between SP and FP	Companies supply a demanded and unique level of ESP to maximize their profits.	Some studies found no or inconclusive correlations (Anderson and Frankle, 1980; Aupperle <i>et al.</i> , 1985; Freedman and Jaggi, 1982)

Table 3.6 Framework suggesting Neutral FP and ESP Link

**Table 4 Frameworks Suggesting a Positive Link between FP and ESP**

Framework	Description	Empirical evidence
<b>Social impact hypothesis</b> (Cornell and Shapiro, 1987) <i>Higher ESP leads to higher FP</i>	Meeting the needs of various non-owner stakeholders increases FP. Failure to meet less explicit needs of stakeholders generates market fears (i.e. affects company reputation), thus increasing a company's risk premium and affecting FP. Actual ESP costs are minimal compared to the potential benefits.	Pava and Krausz (1996) and Preston and O'Bannon (1997)
<b>Available funds hypothesis or slack resources theory</b> (Waddock and Graves, 1997b) <i>Higher FP leads to higher ESP</i>	Superior FP enables companies to devote more resources to ESP.	McGuire <i>et al.</i> (1988), Kraft and Hage (1990), partially Moore (2001)
<b>Positive synergy: "Virtuous circle"</b> (Waddock and Graves, 1997a)	Simultaneous relationship combining slack resources and good management Good management does most things well, including both ESP and FP. Good management and good ESP are synonymous when ESP is defined in terms of the stakeholder relationships considered important to the firm's performance and not in terms of discretionary activities, e.g. philanthropy.	Empirically supported by Preston and O'Bannon (1997), Pava and Krausz (1996) and Stanwick and Stanwick (1998)

Table 3.7 Framework suggesting Neutral FP and ESP link

According to <http://www.f2.washington.edu>, the authors explain that the current portfolio of competing theoretical frameworks is comprehensive. They note that



“the typologies provided in Table 1 (3.4) do not specifically allow for non-linear results such as an inverted U relationship (The inverted U suggests that there is an optimal level of ESP). Deviations from this corporate optimum are associated with lower levels of FP (Lankoski, 2000). Just such an inverted U relationship was discovered by, among others, Bowman and Haire (1975), Sturdivant and Ginter (1977) and Lankoski (2000). This relationship is intuitively appealing, since “excessive” improvements in ESP (e.g. towards a zero emission goal) are extremely costly and would most certainly damage corporate profits” (Salzmann, forthcoming). According to <http://www.f2.washington.edu>, “This helps explain in part (alongside significant flaws in the methodology) the failure of so many empirical studies to prove or find one simple positive or negative association between FP and ESP. It is impossible to find a simple link because the companies surveyed were in all likelihood at different positions on the inverted U curve, depending on their individual cost/benefit situation”.

### **Empirical Studies:**

According to <http://www.f2.washington.edu>, “**Instrumental studies** try to empirically confirm or deny a hypothesized causal sequence and/or link between FP and ESP retrospectively. They follow two broad streams of methodology, namely largely qualitative case studies and quantitative analyses. Case studies are dominated by stories about successful pollution prevention projects and cost savings in mature, commodity and extremely price-sensitive sectors such as chemicals. They also refer to other issues, such as risk avoidance and corporate sustainability as part of business excellence (Weiser and Zadek, 2000)”. According to Salzmann: “Case studies have two essential draw-backs. First, the evidence presented is often not hard enough, since it is based on qualitative data; and, second they are often only valid for a specific sector or company, hence their applicability is limited (Salzmann 2005).”

**Quantitative analyses** according to Salzmann, “are based on three different

methodologies:

(1) Portfolio analyses compare the performance of constructed model portfolios with a benchmark index. However, the results are ambiguous and contingent upon different factors such as the time period under consideration, risk adjustments and the re-weighting of portfolios.

(2) Event studies assess the impact of good or bad environmental or social incidents on companies' share prices. Although the results show share price movements, studies are short term—sometimes limited to only a few days.

(3) Multivariate analyses examine associations between different measures of FP and ESP. Some studies also control for the influence of potential moderating factors such as company size and risk.

The most significant study in this area is by Lankoski (2000), who empirically analyzed the influence of industries, plants and time on environmental profit. He found that plants had roughly forty times more effect on environmental profit than crude industry effects thus pointing to a lack of differentiation in instrumental studies so far (Salzmann 2005)."

According to <http://www.f2.washington.edu>, "The wide majority of studies identified have focused on multi-industry US samples, leaving a vast research area of single industry sectors (I claim, such as food and beverage and geographical areas such as Western Europe) largely untouched".

Salzman et al 2005 also state that "In addition to the complexity of the research area (which results from the variety of environmental and social issues that affect different industries in different countries), the authors attribute the inconclusiveness of the results to the following shortcomings in the (5 listed below) methodologies:

**1. The use of a wide variety of sometimes poor ESP measures.** Since its introduction in 1982, the Fortune Corporate Reputation Index has been increasingly used as a data source leading to more consistency with respect to

ESP measures. Several authors have argued for the use of multidimensional ESP measures (Freedman and Jaggi, 1982; Griffin and Mahon, 1997; Ullmann, 1985; Wood and Jones, 1995), which could facilitate a more comprehensive (perceptual and factual) and thus accurate measurement of ESP. However, multidimensional measurement naturally leads to limited sample sizes.

**2. Lack of effort to empirically test definitions and concepts.**

**3. Lack of significance testing and control for interaction with other variables**—particularly in the early studies.

**4. Inadequate sampling techniques, also due to limited data availability.** Empirical studies have focused mainly on large, pan-sector samples, which may have masked sector-specific differences such as unique internal competencies, external pressures, degree of public visibility, stakeholder configurations, level of regulation, etc. A few studies took more differentiated perspectives (Greening, 1995; Moore, 2001; Simpson and Kohers, 2002) by focusing, for example, on one particular industry or comparing different industries and plants.

**5. The use of a variety of FP measures, presumably for reasons of convenience.** The argument about the appropriate FP measure appears to be ongoing. Both accounting and market-derived measures focus on different aspects of performance and are subject to particular biases. Whereas accounting measures can be confounded by different accounting procedures and asset allocations across different industry sectors, market-derived measures may reflect more than just financial performance. (Salzmann 2005)”

**Results of instrumental studies suggest** that the **FP-ESP relationship is complex and contingent on situational, company- and plant-specific factors** that are difficult to detect through most analytical approaches. Furthermore, the issue of the causal sequence between FP and ESP remains unresolved.

**Descriptive Research,** the authors analyzed Managers’ Attitudes and Companies:

Managers' Attitudes. According to <http://www.f2.washington.edu> "Various authors (Bowman,1977; Cruz Deniz-Deniz and Garcia-Falcon, 2002;Holmes, 1976; Marz et al., 2003; Quazi and O'Brien,2000; Rojsek, 2001) have analyzed managers' social orientation or the perceptions of corporate social responsibility and related concepts". According to Salzmann et al, "**Unexpectedly proactive attitudes of respondents are obviously due to social desirability bias.** Since these studies primarily examined managers' attitudes towards the responsibility of business Which issues should be taken into consideration, which stakeholder demand should be met?), they are by design not very effective at providing significant insights into the nature of the BCS. Instead they point to the need for a sound BCS, since managers are naturally focused on the economic dimensions of corporate responsibility (Salzmann 2005)".

Companies. According to Salzmann. "**A great number of studies have examined internal and external drivers and barriers to corporate sustainability management** (Bansal and Roth,2000; Henriques and Sadorsky, 1995; Lawrence and Morell, 1995; Sharma et al., 1999; Skjaerseth and Skodvin, 2001; Winn, 1995). **Some of them implicitly took the economic rationale into consideration (Salzmann 2005).** However, the literature according to <http://www.f2.washington.edu> reveals "two significant shortcomings:

- 1) **There is a clear lack of comparative approaches.** Few studies have taken an explicit cross-industry approach such as Henriques and Sadorsky (1996) and Banerjee et al. (2003) have done. None have accounted for both industry and country effects.
- 2) **Even fewer studies have explicitly focused on the BCS as a driver of corporate sustainability management,** i.e. what determines the BCS, how strong is the need for it? Again Lankoski's study constitutes a rare exception because it reports on several major determinants of environmental profit, including technology, regime

(regulatory and economic “rules” of the game) and visibility (Lankoski, 2000”).

### **Review of Tools (According to Salzmann)**

“Several scholars, think-tanks and consultancies have also worked on the BCS. Their efforts can be broadly assigned to three categories: (1) Collections of evidence on the BCS and broad recommendations for actions; (2) “Coaching” tools that serve as a detailed roadmap for managers on how to build their BCS; and (3) Valuation tools that are designed to quantify the BCS (Salzmann 2005). In the following Tables 5–7 (3.8-3.10), borrowed from Salzmann et al, the authors briefly describe some examples for each of the three categories.

**Table 5 Collections of Evidence and Broad Recommendations for Actions**

Tool/Project	Description
EarthEnterprise tool kit (International Institute for Sustainable Development (IISD), 1994)	<ul style="list-style-type: none"> <li>❖ Helps companies to “build new kinds of business”</li> <li>❖ Primarily targets the North American entrepreneur in a small or medium-sized green or sustainable enterprise</li> <li>❖ Provides “strategic advice and specific, action-oriented suggestions to deal with real business problems” in the areas of consumer markets, green procurement, technology etc.</li> <li>❖ Includes a list of information sources for follow-up</li> </ul>
Conversations with disbelievers (Weiser and Zadek, 2000)	<ul style="list-style-type: none"> <li>❖ Review of almost exclusively quantitative evidence showing when corporate engagement (exclusively referring to the social dimension of sustainability) creates business and societal benefits</li> <li>❖ Target group: “people who seek to persuade sceptical managers and executives”</li> <li>❖ Features: Assessment tool for evidence collected, and a “data warehouse”, based mainly on US and UK examples</li> </ul>
Buried treasure: Uncovering the business case for sustainability (SustainAbility, 2001)	<ul style="list-style-type: none"> <li>❖ Systemizes the BCS in “The Sustainable Business Value Matrix” along two dimensions: business success (financial performance, financial drivers) and corporate SD (sustainable development) performance</li> <li>❖ Links business success and corporate SD performance through logical arguments and corresponding empirical evidence</li> </ul>

Table 3.8 Collections of evidence and broad recommendations for actions

**Table 6 Coaching Tools**

Tool/Project	Description
To whose profit? Building a business case for sustainability (WWF-UK, 2001)	<ul style="list-style-type: none"> <li>❖ Designed to “guide senior managers as they work towards building their own business case”</li> <li>❖ Reviews existing evidence supporting the BCS</li> <li>❖ Provides a route map towards the BCS, which consists of six steps ranging from (1) identifying impacts to (6) determining preferred actions for inclusion in a business case</li> <li>❖ Methodologies for every step are mentioned and briefly explained</li> </ul>
Die Compass-Methodik. Companies and sectors path to sustainability (Kundt and Liedtke, 1999)	<ul style="list-style-type: none"> <li>❖ Originally developed for product lines and regions</li> <li>❖ Comprises 5 modules including COMPASS profile, vision, analysis, management and report</li> <li>❖ The management module assists with building the business case internally and with operational roll-out (e.g. cost and resource management, stakeholder dialogue, conflict management)</li> </ul>

Table 3.9 Coaching Tools

**Table 7 Valuation Tools**

Tool/Project	Description
Pure profit: The financial implications of environmental performance (Repetto and Austin, 2000)	<ul style="list-style-type: none"> <li>❖ Scenario-based methodology uses standard techniques of financial analysis to derive measures of expected environmental impacts on share values and financial measures of environmental risk</li> <li>❖ Applied to 13 major US pulp and paper industry companies</li> <li>❖ Findings: Even though the underlying scenarios and probability assumptions are the same for all companies, risk exposure and financial implications differed significantly from company to company in terms of the most likely outcome (mean), the range of possible outcomes (variance) and their degree of imbalance towards negative and positive outcomes (skewness)</li> </ul>
Stalking the elusive business case for corporate sustainability (Reed, 2001)	<ul style="list-style-type: none"> <li>❖ Elaborates on the fundamentals of the BCS</li> <li>❖ Describes several conventional valuation methodologies and emerging methods to quantify the BCS financially</li> </ul>

Table 3.10 Valuation Tools

All three kinds of approach are worthwhile. They are complementary means of increasing managers’ understanding of the BCS.

**Conclusion:**

According to <http://www.f2.washington.edu>, **There is still a clear lack of (i) sector-specific research to facilitate more accurate measurement and thus increase internal validity, and (ii) comparative (cross-industry, cross-country or cross functional) studies.**

According to Salzmann et al, The authors predict that because “BCS as a research topic is inherently linked to two major stumbling blocks, this may also

prevent more conclusive results of quantitative instrumental studies in the future:

**Complexity:** The nature of the BCS is extremely complex since it is contingent on a number of parameters (e.g. technology, regime and visibility) that vary between industries, plants, countries and different points in time.

**Materiality:** The **BCS may exist** but may often be marginal in practice and/or difficult to detect. It appears to **be mostly limited to the reduction of downside operational risk and to measures to increase eco-efficiency, the “no-brainers” of good (rather than corporate sustainability) management.** The economic value of more sustainable business strategies is a lot more elusive, since it only materializes in the long term. Furthermore, effects on intangible assets (e.g. brand value, employee loyalty) are difficult to quantify (Salzmann 2005)”.

**The lack of descriptive studies on the importance and role of the BCS in companies was identified as the greatest gap in the existing literature.** According to Salzmann et al “Most importantly, research so far has failed to:

- (1) Identify managers’ key economic arguments used to drive corporate sustainability management internally.
- (2) Examine how managers build these arguments (e.g. more qualitatively or quantitatively, using what tools and processes exactly?).
- (3) Assess the effectiveness of individual arguments and the corresponding success factors and barriers (Salzmann 2005)”.

### **3.7 Customer Expectations for Companies to be Socially Responsible**

The literature review search identified no less than 17 papers, journals in the period 2001-2011 and another 21 articles and a book for the period 2012-2015.

Three of these papers summarize the trends in that area of research: In the past, “researchers have provided little information on how corporate social

responsibility impacts profitability; Companies are being pressured to both maintain profitability and behave in socially responsible ways” ([www.highbeam.com](http://www.highbeam.com)).

**The first paper:** MOHR, L. A., WEBB, D. J. and HARRIS, K. E. (2001), Do Consumers Expect Companies to be Socially Responsible? The Impact of Corporate Social Responsibility on Buying Behavior. *Journal of Consumer Affairs*, 35: 45–72. doi: 10.1111/j.1745-6606.2001.tb00102.x is a very convincing paper. It advocates that customers expect companies to be sustainable from extensive US based research quantitative surveys and “in-depth interviews of consumers to determine their views concerning the social responsibilities of companies. They present a typology of consumers whose purchasing behavior ranges from unresponsive to highly responsive to sustainability” ([www.highbeam.com](http://www.highbeam.com)) .

#### **Does Company Social Responsibility (CSR) affect Consumer decisions?**

Customers need to be aware of the company's CSR decisions before this factor can impact their attitudes and purchasing decisions. “The 1999 Cause/Roper “Cause Related Trends Report” examined consumer responses to companies' participation in cause related marketing. **80% of those surveyed** every year since 1993-1999 **reported having a more positive image of a firm if it offers support to a cause they care about.** Furthermore given parity in price, **over 2/3 or more of the sample said they are likely to switch brands or retailers to those participating to cause related marketing.** Importantly, socially and politically active consumers are more likely to have a positive image (94%) of firms practicing cause marketing and to change brands (79%) or retailers (77%) to support these companies ([www.highbeam.com](http://www.highbeam.com))”. Academics older research report similar results. in 225 interviews, Ross, Stutts and Patterson (1991) found 49% of respondents argued that a firm's support for a cause was the primary reason for them to purchase a product, whereas 54% said they were likely to be influenced to try a new brand in the future based on cause related promotion. Consumers also

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report they expect firms to protect the environment and behave ethically and see this as an important issue for which they would be willing to pay a premium (up to 30% According to Hartmann Group in 2011). On the other hand a study by Creyer and Ross (1996) showed that while consumers prefer an ethical cereal manufacturer to one that is not, they are not willing to pay more for the cereal coming from the Ethical cereal manufacturer, but they did demand lower prices from the unethical cereal manufacturer.

**Research conclusions include (According to Mohr et al 2001):**

“1-Higher levels of consumer knowledge of firms social responsibility records influence Socially Responsible Consumer Buying (SRCB).

2-The more consumers view their purchasing power as influential over company behavior, the more they are likely to practice SRCB.

3-Consumers who define quality of life primarily in economic terms (i.e. money = higher quality of life) will be less likely to practice SRCB than consumers who define quality of life more broadly.

4-Consumers are more likely to boycott irresponsible firms than to support responsible firms.

5-Consumer beliefs about CSR (that firms should be socially responsible and that social responsibility brings higher profitability to companies) are often inconsistent with their behaviors (i.e. not purchasing based on CSR). The relationship between beliefs and behavior will be stronger a) the more knowledgeable consumers are about CSR issues and b) the more important they judge these issues to be “ (Mohr et al 2001).

Managers should note that consistent with prior research and literature, there is a substantial and viable and identifiable market segment that exists that considers a firms level of social responsibility in its purchase and investment decisions.

### **The second paper:**

Langenwalter G., (2006), "Life" is Our Ultimate Customer: From Lean to Sustainability, Association for Manufacturing Excellence 2006, Vol 22, Issue 1, pp 5-15.

The author claims "sustainability can be thought of as lean extended to a much broader objective because it is much like lean both in concept and practice. He states that sustainability has a good track record of improving company finances because of the emphasis on eliminating waste and the substantial increase in creativity by employees at all levels" (Langenwlater 2006).

The author uses Timberland to illustrate his case "Timberland", which is trying to "use the resources, energy, and profits of a publicly traded footwear-and-apparel company to combat social ills, help the environment, and improve conditions for laborers' around the world," has achieved outstanding the financial results over the last five years (Timberland Sales are up 9.7% per year, Earnings per share up 20% per year, Stock Price up 64%).

According to the author, the quantifiable business benefits from a well-designed sustainability program fall into the following three classic categories:

**"1-Reducing Operating Costs:** When done by eliminating waste, environmental improvement should also reduce cost unless the anomalies of the cost system mask the effect. For example:

Oki Semiconductor Manufacturing in Portland, OR, implemented one of the first ISO 14001 environmental management systems in the United States. After a year, its ongoing annual savings were double the out-of-pocket costs. Baxter International saved \$17,000 in three months by reducing water usage in one plant, with no capital investment. Its wastewater treatment plant no longer needed to expand. The Collins Companies, a wood-products company founded in 1855, reclaimed heat from ovens that cure hardboard coating. It saved \$118,000 in electricity cost per year by installing a single, 300hp electric motor to replace six motors. Altogether, it saved an estimated \$1 million in the

first year of implementing sustainability principles. Likewise, companies that adopt socially-friendly policies reduce operating costs due to lower employee turnover, and improve profitability due to their ability to attract and retain brighter and more creative employees (without having to pay a salary premium). For example, Jeff Swartz at Timberland believes that the idea of helping others will create a "more productive, efficient, loyal, and committed employee base, which in turn helps produce 'real' results."

**2- Attracting and Retaining "Better" Customers:** A company focused on the Triple Bottom Line offers more than price/delivery/quality to potential customers and potential suppliers. Customers interested in more than price are better long-term partners. They have a lower credit risk and a better chance of enduring. Both Nike, a leading footwear manufacturer, and Norm Thompson, a leading Northwest retailer, are replacing conventional clothing with environmentally friendly clothing.

**3-Reducing Risks:** Companies that have embraced Corporate Social Responsibility ("CSR") have outperformed the broader stock market indices since the inception of the Dow Jones Sustainability Index. Market analysts are starting to realize that socially responsible businesses are lower risk than "profit-is-the-only-goal" businesses like "Enron.

The less quantifiable, but perhaps even more important, aspects of implementing sustainability include: a) Reputation management, b) Investor relations and access to capital, c) Learning and innovation, d) License to operate.

**So why start sustainability now?** The author states that most Fortune 500 companies in the US have an executive in charge of sustainability, that the early adoption phase is rapidly ending, and that just like lean in the late 1980s, the companies that adopt sustainability now will enjoy a major, long-term competitive advantage in their industries, which will force the laggards to adopt it.

**Costs, Paybacks, and Risks:** From a business strategy viewpoint, sensibly starting down the sustainability path is a no-lose proposition (Table 3.11).

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**Should We Risk Being a Sustainability Leader?**

		Marketplace Regards Sustainability As ...	
		Important	Unimportant
Company Strategy on Sustainability	Implement	<b>A. Big Win</b> Cost savings Better customers Better employees Better suppliers	<b>B. Smaller Win</b> Cost savings Better employees Better suppliers
	Don't Implement	<b>C. Big Loss</b> No cost savings Lose best customers	<b>D. Neutral (delay)</b>

**Table 3.11** Sustainability Investment Risk. Source: Langenwalter G., (2006)”

The oversimplified table proposed by the author may be questionable. The Table in it's current form implies that the sustainability investment risk brings a big or smaller win to a company depending on wether the marketplace considers sustainability as important or unimportant. The table also states that when the company does not “take the opportunity” to invest in sustainability and the market sees this as important there is a big loss (we would add “in opportunity” for cost savings etc, and if the market does not see sustainability as important it's a neutral result.

In the simplified argumentation that companies investing in and implementing sustainability always have some cost savings, better employees and better suppliers is questionable, otherwise everyone would be doing it. Certainly it is conceavable that some companies may be making more or less money by chosing not to invest in or in delaying to move to sustainability. Why would these companies assuming they have the capital for the investment and chose to delay, necessarily lose the opportunity to savings or other benefits? Similarly, why would a company such as an SME who does not have the funds for the investment necessarily lose by delaying that investment?

“The argumentation about a company's customers and investors expecting it to be a sustainability leader is reasonable. Wanting to be first is often more

costly to a company to being slightly behind the leader and learning from the other leader's mistakes. We can agree with the author that doing sustainability only for public relations is not a good strategy. By contrast, a sustainability leader for the right reasons attracts environmentally-minded and socially-minded customers, employees, and investors. But, as with lean, with an honest effort toward sustainability, we will agree with the author that a company attracts customers with similar values. It can also obtain better supplier partnerships, and if it must survive using more limited resources, it has a head start learning how to do so (Langenwalter 2006)".

Making an investment requires you to have the capital to make it, and the resources, and that the ROI (Return on investment) will occur in some short to medium timeframe. Without knowing the finances and the special circumstances of a business in a given market at a given time makes that argumentation very optimistic.

### **The third paper:**

Sheth J. N, Sethia N. K., Srinivas S., (2011), Mindful consumption: a customer-centric approach to sustainability, Journal of the Academy of Marketing Science February 2011, Volume 39, Issue 1, pp 21-39.

The authors claim that current sustainability strategies fail in three respects: they **are not customer focused**, they ignore threats of global over-consumption, and they do not take a holistic approach. The authors propose a framework for a customer-centric approach to sustainability and introduce the metric of mindful consumption (MC) in terms of "environmental, personal and economic well-being of the consumer (Sheth 2011)". Thus concept is based on the belief of the existence of a consumer mindset of caring for self, for community, and for nature, that translates behaviorally into tempering the self-defeating excesses associated with acquisitive, repetitive and aspirational consumption. Finally they illustrate how the marketing function can be used to successfully implement a customer-centric approach to sustainability.

### 3.8 Recent Updates since Study Completion

In 2014, we identified the following three interesting articles:

Laryea S., Alkizim A., & Ndlovu T., “The increasing development of publication on sustainable procurement and issues in practice”, (2013)

This paper provides an overview of the developments in relation to sustainable procurement through a review of 63 publications indexed in Scopus and found published between 1996 and 2013. Reference is made to the increasing development of standards, guidance notes and research focused on the construction sector.

They offer an update on the related terms to sustainable procurement in recent literature to also include:

**Sustainable sourcing, environmentally preferable procurement, sustainable purchasing, sustainable supply chain management, and green procurement.**

Special topics discussed include:

**“Obtaining commitment from organizations”** – mentioning how private sector companies want to appear “green” to bid on public sector tenders with public agencies that are driven by Sustainable procurement policies imposed on them by central governments. Correia et al (2013) [Correia F, Howard M, Hawkins B, Pye A, Lamming R (2013) Low carbon procurement: An emerging agenda. Journal of Purchasing and Supply Management 19(1) 58-64] explains how government agencies across the world are driving policy change towards global conservation of the planet through the “power of procurement” as a means to impose compliance to standards and good practices.

**“How is sustainable procurement measured?”** - mentioning Wilkinson and Kirkup (2009) [Wilkinson A, Kirkup B (2009) Measurement of SP. East Midlands Development Agency, Nottingham, UK ] presenting various

methodologies for measuring aspects of sustainability – none of which provide a means for benchmarking organizational performance with regards to actions taken by companies to implement sustainable procurement. The proposed solution being to use the “Flexible Framework” as a self-assessment mechanism and implement the five phases of Sustainable Procurement to measure and monitor their progress (<http://sd.defra.gov.uk/documents/flexible-framework-guidance.pdf> ).

The authors Laryea S., Alkizim A., & Ndlovu T., “The increasing development of publication on sustainable procurement and issues in practice”, (2013) provide a catalogue of 63 major research papers on the subject from 1996 - 2013 that can be viewed in their article.

Kalubanga Matthew, “SUSTAINABLE PROCUREMENT: Concept, and Practical Implications for the Procurement Process.” (2012) International Journal of Economics and Management Sciences Vol. 1, No. 7, 2012, pp. 01-07. Here the author mentions that prior research has tended to examine sustainable procurement within particular countries in the developed economies e.g. United Kingdom (Hall, M., and purchase, D.; 2006), Sweden (Faith-Ell, C., et al.; 2006), USA (Coggburn, J.D.; 2004), Germany (Gunther, E., and Scheibe, L.; 2006), Canada (Hartshorn, J., et al.; 2005) and Spain (Cambra-Fierro, J. and Ruiz-Benitez, R.; 2011). He states that all of these previous studies covered aspects of sustainable procurement in the private sector and generally focused on manufacturing industries and the environmental dimension of sustainability (Simpson, D.S., and Power, D.J.; 2005; Srivastava, S.K.; 2007; Svensson, G.; 2007; Walker, H., & Brammer, S., 2009). Walker & Brammer also reiterated that comparatively little research has investigated sustainable procurement practices in the context of the public sector.

The paper includes a discussion on “**Implications for the procurement process**”, the authors explain that Sustainable procurement is now used by organizations to rethink and retool business processes (in this case the procurement process) to meet some of the ‘greener’ options.” These good

practices now require incorporation of environmental performance criteria in the supplier selection-evaluation stages. Also that 'World Class Organizations' now incorporate environmental requirements in their product or goods/service procurement specifications. The incorporation of environmental issues in product design, evaluation and selection (also supplier selection) processes is essential. With regards to the evaluation of Suppliers, it states that organizations need to work out their supply chain partners to develop sources of supply, which support a culture of improvement of social environmental performance and they should adopt specifications, which develop socially and environmentally preferable goods and services at competitive prices.

Stephen Brammer, Helen Walker, (2011) "Sustainable procurement in the public sector: an international comparative study", *International Journal of Operations & Production Management*, Vol. 31 Iss: 4, pp.452 – 476. Offers interesting statistics:

In the US the focus is on 63,5% from minority and women owned SMEs 10.9% elsewhere of which 38.5 have a formal program for buying from minorities, 6.5 elsewhere. In Europe the UK being one of the leaders of SP 80% buy from SMEs, 60% elsewhere and 70% buy local, 60% elsewhere. In the rest of West, East Europe & Scandinavia, 48% ask suppliers to commit to waste reduction goals, <30% elsewhere, 46% ask suppliers to reduce packaging materials, <30% elsewhere.

### **3.9 Gap Analysis of Literature Research**

Sustainable Procurement has been the subject of many research projects and has benefited from a wide coverage in specialized Journals over the last 10 years (See Walker Helen as the best source on the subject). This subject besides being important to academics is equally important to practitioners because this innovative and current subject concerns management and their decision to invest or not in this area given the recent articles attesting to companies making profits from sustainable procurement.



Prior research has focused on a specific country or describing aspects of a specific public sector in a specific geography (e.g. Swedish Military green procurement initiatives). Many recent publications from schools and Universities around the globe, describe public sector implementations of sustainable procurement, not all of these can be considered “best practices” as the entities involved are not financially bound to profitability as in private sector companies. Further more, the boards of these public companies are rarely independent from policies dictated by states or governments. The subject is surely interesting but we chose not to focus on public procurement.

Most sustainable procurement studies identified were cross industry, mainly focusing on the US and Asian Markets, (Europe represents less than 30% of the articles), thus our choice to explore Western European Companies. One of our main concerns was to chose companies that can be compared in a similar industry and enable us to perform comparisons between countries.

Some excellent sustainable procurement studies were conducted recently which compared German and UK metalurgy firms and others compared car manufacturers, while others building companies. These were excellent but could hardly be used to compare countries that have no car industry.

Eastern-European countries were intentionally ignored in literature and for our study, because the majority are not known to function as effectively as US companies or as advanced and competitive as the best of Asian or Western European companies.

The majority of publications have a focus on large and mid-sized companies (less than 15% of articles relate to SMEs in procurement related Journals). Here again, we decided to innovate and survey not only large and medium but also many small companies so as to capture the essence of the sustainable procurement practices. Over 40% of literature addresses Public procurement implementations, and 60% private sector implementations, 10% of the private sector implementations focus on SMEs (thus literature is not representative in their coverage of the 90% of companies that are SMEs). Chosing to survey SMEs is a choice that involves some risk because of their limited man power

resources which makes them not as readily available as large companies to respond to surveys and participate in studies.

Some examples can be found in literature search where companies have not been very responsive or supportive to their customers. This is confirmed by highly publicized news of lawsuits of multinational food and beverage firms that failed to do their best to offer a sustainable value-added proposition to their customers. Several recent books (such as from Laville E.) have expressed that companies are now being required by a growing number of consumers to monitor their suppliers and do the right thing with regards to preserving the planet and the environment. Customers we are being told are more conscious of their purchasing power and make a purchasing selection which is not merely based on basic product characteristics requirements and price. This question is one of these that we explore to learn about the relationship of companies and their suppliers and see how their policies are practiced to offer that desired customer value proposition.

Finally we found no journal or research that described a step-by-step approach that can be used by companies to self-evaluate to see how they are doing compared to the leaders, hence we devised the study to capture that information and attempt if possible, to provide a "tool" enabling companies to compare their evolution with the leaders of the field.

### **3.10 Conclusion of the Literature Review Section.**

Existing literature on sustainable procurement discussed successful implementations and how sustainable procurement was good for some companies. Marketing and sustainability studies such as BBMG in 2011 and The Hartmann Group in 2012 and 2013, focused exclusively on the consumer but mainly for the US market, while HEC and AT Kearney in 2012 and 2014 had a 30% focus on the European market. Interviewing customers proposed by companies casts some doubts as to the validity of the sample.

We found that no previous studies had ever focused on the customer perspective as perceived by the company. Asking customers across Europe about their opinions on firms does not necessarily reveal how these sustainable procurement implementations were conducted. In an ideal world for every company surveyed and interviewed, there should be a similar process for their customers for the data to be cross checked to have a spherical perspective. This would be a very time consuming and costly process. Most companies nowadays are aware of consumer desires and tailor to these wishes to establish a long term loyalty through that differentiation, thus explaining why we decided to ask companies about their customers perspective as they perceive it.

The majority of studies focus on large and mid-sized companies. Choosing to survey SMEs is a choice that involves some risk on our part because of their limited resources which makes them less available than large companies to respond to surveys and participate in studies.

We wanted to find an industry which has traditionally existed in all Western European countries and offers variety, similarities and differences. The Pharmaceutical Market was a potential candidate, but we chose the Food and Beverage instead. The Food and Beverage industry is one of the sectors of the economy that has been doing well even in the times of Economic crisis, and offers many sizes of businesses across the geography that a researcher can compare to derive patterns and trends. It is a competitive sector that supports exports outside of the EU and selling of local traditional products

which are usually desired by consumers for their value proposition.

Consequently, our area of focus of our study in the remaining chapters of this thesis has become: **Value Added Sustainable Procurement Customer's Perspective as perceived by companies: An Empirical Study of Western European Food and Beverage Companies.**

The next three chapters (4, 5, 6) present the main findings of the study, and the conclusion in chapter 7. Additional elements, bibliography and statistical details are available in the Appendices at the end of this thesis.

#### **4. Research Methodology & Quantitative Statistical Analysis**

In this section we describe what methodology was used for data analysis based on prior literature research (Crowther, D. et al 2008) and the reasons as to why the specific one was selected. It follows the introduction to the research paradigm of the onion layers of Saunders as described in section 1.5 of this thesis in accordance with current research practice in the field (Ralph N. et al 2014).

The Research Philosophy used is that of Pragmatism, which argues that to answer the research question of sustainable procurement as practiced by Food and Beverage companies in Western-Europe it is possible to work within both positivist and interpretivist positions. It applies a practical approach, integrating different perspectives to help collect and interpret data [Yancey P. et al 1986]. The Approach chosen is that Abductive Research, which involves the collection of data to explore a phenomenon, identify themes and explain patterns of sustainable procurement, to generate a new theory which is subsequently tested.

The inductive approach [Ramanathan, R. 2008] enabled to initially define important issues per discussions with domain experts and practitioners of sustainable procurement and to identify key topics and issues.

Then it proceeded in using the traditional deductive approach [Walker H. et al 2012] to search the literature and identify journal articles covering these same issues that are important to the practitioner. However it introduced an intended observer bias – acceptable under the Ground Theory [Thornberg, R. et al. 2011] – that positivist theory would not have allowed – because it helped better analyze and uncover gaps in the literature with the prior knowledge of the practitioners in order to create our research hypothesis. Then, following a positivist approach research questions were created for the survey questionnaires that enable data collection and measurement.

The intent all along is the ability of the research to be reproducible by any third party researcher [Kaufmann, L. et al 2011]. Then after survey test runs and the final survey run, the survey data was collected but it but stopped short of

analyzing it yet. In parallel with the quantitative survey development as described previously, the interpretivism approach was used to design a qualitative structured interview framework to enable the confirmation of survey answers [Collins, H. 2011]. This also gave respondents the opportunity to be probed to respond about the market and key factors that influence their implementation of sustainable procurement (the gap between strategy and implementation). This process helped gather in-depth insights into the industry only achievable through this inductive approach [Thornberg, R. et al. 2011]. These interviews took place several weeks after the quantitative surveys had all been collected.

The methodological choice used is that of Mixed-Method Complex: Using both quantitative and qualitative data collection techniques and analysis procedures concurrently [Bernard, H. et al 2010]. This involves combining quantitative and qualitative approaches in other phases of the research such as research question generation.

This process involves a “triangulation” a sort of 360 degrees view which allows the comparing and combination of the results coming from two separate processes to compare where quantitative and qualitative data converge or diverge in relation to addressing the research questions.

In parallel with the statistical methods of factor analysis and exploration of patterns and data reduction from the survey data, in accordance with Grounded Theory [Pettit, T. et al. 2010 & Pagell, M. et al. 2014]: a model was developed which originated from the process of Data Collection and Data Analysis as advocated in the Grounded Theory Method techniques (standard stratified sampling technique) and analytic procedures to derive meaning from the subjects and settings being studied.

### **4.1 Materials and Methods**

Purpose of this study is to investigate the application of the practice of sustainable procurement in private companies that operate in Western Europe. While most-recent prior research has focused on a specific country or describing aspects of a specific public sector in a specific geography (e.g. Swedish Military green procurement initiatives), this dissertation presents a study focused on privately owned non-government firms. Our search did not identify published similar large-scale research in recent years focused on SP in the food and beverage industry in the geography in Switzerland and Western European countries. Obtaining systematic information from companies in Europe, especially SMEs has been a significant challenge for researchers. Experience has shown that SMEs are in general even more reluctant to participate and respond to surveys than larger companies because that means committing some of their limited critical resources from the immediate operational priorities of the firm. While management generally understands the benefits and applicability of survey results, this is less the case for untrained employees assigned to procurement functions. We found that the Academic terminology of sustainability was confusing to some employees as in “sustainable procurement” and thus assisted them with our Glossary which answers most of their frequently asked questions.

### **4.2 Questionnaire Design**

**The thesis preparation planning was as follows:**

- Reviewing scientific literature & Gap Identification
- Develop Questionnaire
- Select sample of population and send questionnaire
- Conducting personal interviews according to the results of the questionnaires
- Data collection
- Statistical data analysis
- Comparative analysis of areas undertakings and between countries
- Focusing investigation among several states of Western Europe
- Deduct key conclusions
- Write the thesis

For the development of the questionnaire, the following steps were followed:

- Preparation of initial questionnaire
- Third party control
- Preparation of pilot questionnaire
- Test completion
- Preparation of the final questionnaire

The syntax of the original questionnaire was based on questionnaires used in the respective studies. Then, based on the originally designed questionnaire, a series of interviews conducted with academics and business executives to explore the understanding of the text and the representativeness of the variables used in these operations. After incorporation of the comments we created the pilot questionnaire. This was later confirmed in the real validity test of the questionnaire which was later finalized after incorporating all proposed changes from initial respondents.

The latest version of the questionnaire (4th edition) includes comments from informal interviews with representatives from companies, to ensure an understanding of the content of the questions and the ability to provide timely clarification for instance on definitions of sustainable procurement and in order to make any necessary changes or improvements.

The mode of the questionnaire was electronic. It was the best solution since we wanted to data processing errors and minimize the cost and time of data collection. Moreover this is the most auditable option, since we wanted to narrow possible data entry errors and achieve validity. This is also a polite way to request help from a company without pressuring the point of being annoying.

### **4.3 Sample and Data Collection**

**Sample:** To ensure sample representation we launched a major web-based



questionnaire and telephone follow-up survey to collect the data of interest and verify the question items with a standard protocol. Our survey was sent to procurement management or management responsible for the procurement function in SMEs located in the Western European geography. SMEs, which participated to the survey, operate in these countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden and the UK. Traditional paper based surveys offer the advantage of being easy to use for respondents to reply. They also impose almost no time constraints to complete the printed questionnaire as they need to look over the form, they have the definite disadvantage that the answers collected will need to be digitized for processing in a statistical package such as SPSS. The telephone as a means for surveys far outweigh the disadvantages according to Frey (1989) and is cost efficient and gives the opportunity to control the quality of the data according to Lavrakas (1993). The major disadvantage according to Lavrakas (1993) is that the average person will not stay online more than 20 minutes for the survey. To address these limitations, we chose a combination of web - based survey and follow-up 15 minute phone interview, where the questions would not exceed 15 minutes to answer. We conducted two pre-surveys to detect potential problems, consulted with professors and procurement executives and after launching the regular web -based survey, used two MBA graduates familiar with the concepts to conduct a follow-up phone survey and answer the questions as they arose. All phone interviews have numbers, and data recorded to control the quality of the survey process (Groves R.M., 1990).

**Data collection:** The target companies for investigation are Large Companies and SMEs. Large companies, as set out in the Recommendation of the European commission adopted on 6th May 2003, are companies with a headcount > 250 employees with a turnover > 50 million Euros. These represent less than 6% of the total private companies operating in Western Europe. The SME definition, as set out in the Recommendation of the European commission adopted on 6th May 2003, defines small and medium-sized enterprises initially in relation to three size criteria: An SME has a staff headcount < 250 employees, with a turnover of <= 50 million Euros. It

encompassed to additional definitions: first, that a small enterprise with a staff headcount < 50 employees and a turnover of < ten million Euros and second, of the Micro-enterprise with < 10 employees and a turnover of < two million Euros. Based on the above criteria for the Year 2012, we selected data from the European Chambers of Commerce and Industry self-ranking database data of their members (where members self -evaluated their companies as "Sustainable" for matching some criteria such as "Having an Environmental Policy"), and further restricted the search to encompass companies from the Food and Beverage industry operating in Switzerland and Western Europe having a total employee number up to 250.

From the total population of 10,700 companies matching these criteria, a set of 2,600 (24,29%) are selected by computer -assisted random sampling for use in the two pre-surveys and the one large final survey.

**Pre-Survey 1** was sent to 200 companies where 67 (33,5% response rate) (Cronbach's Alpha 0,8619 indicating a high correlation and reliability) were useable, no rejects. The feedback had the purpose to improve the clarity and reliability of the questions and contributed to improving the survey.

**Pre-Survey 2** was sent again to the same 200 companies, obtained 76 (38%) valid responses (Cronbach Alpha 0,890 indicating a high correlation and reliability) (the same 67 and some additional which we exclude for the purpose of comparing and computing reliability and correlation for the same companies).

**Pre-roll-out Improvements:** The Appearance and Graphics of the Survey web questionnaire were made more appealing, more straightforward to read and required less time to complete (approximately ten minutes). Three months later after testing and incorporating the last improvements suggested by our advisors we rolled out the final Survey. The feedback helped us add German and French versions of the English Survey together with a Glossary and instructions and common answers to questions respondents might have. (See

[Appendix E](#) and [Appendix F](#)).

**Survey Results Background Information:** (Following 2 previous runs of same survey with Alpha and Correlations already verified in 2012)

Total Population Size = 10,700 companies [100%]

Survey Sent to = 2,600 companies [24, 30%]

Total Responses Completed = 641 Completed Surveys [24, 65% of 2600]

Responses Rejected = 109 Rejected [4, 19% of 2600, 17, 0% of Responses]

Valid Responses = 532 Accepted [20, 46% of 2600, 83, 0% of Responses]

429 were kept for SMEs analysis with a response rate of 16,5%.

#### **4.4 Questionnaire Measurement**

##### **Structure**

The structure of the questionnaire has 4 parts for the better understanding of the survey.

The first part is the demographic questions, which are very important for the categorization of the results and the process of the data collected.

In the demographic section we captured the following information about each company:

Company name (free text)

Country (pull-down list)

Company address (free text)

Company telephone/fax (free text)

Industry (pull-down list – three options)

Size of the company (pull-down list – three options)

Profile of respondent (pull-down list – five options)

Name of the respondent (free text)

The Second part is based on the sight of the internal environment, processes, decisions and operations that take place in the organization.

This section contains 15 Likert-five questions (from 1 to 5 where 1= Strongly Disagree, 2=Disagree, 3=Neither Disagree Nor Agree, 4=Agree, 5=Strongly Agree), based on:

Having environmental policy

Having tools and metrics to verify implementation

Supplier compliance and verification

Risk management

Internal initiatives improving the brand image

Practice innovation and Market research

Value added quality culture

In the third part an effort was made to understand the impact of the management decisions upon SVP between suppliers, customers and the general external environment of the company.

This section contains 18 Likert-five questions (from 1 to 5 where 1= Strongly Disagree, 2=Disagree, 3= Neither Disagree Nor Agree, 4=Agree, 5=Strongly Agree), based on:

Management strategy setting

Procurement team and Suppliers training on SVP

Marketing and sales impacted by SVP

Packaging and labeling strategy

External opinions on company's sustainability strategy

Customer's decision making

Customer value added for labeling

Strategy differentiation

In the last part some optional questions take place about the willingness of the company to get feedback about the results and participate in further interviews.

Three free-text and two yes-no questions

### **4.5 Statistical Data Processing**

The set of statistical analysis on the data collected from the research questionnaire was performed using the statistical package SPSS (version 20). In the first phase, we exported the descriptive statistics of the survey responses, in order both map the state of sustainable procurement for companies that operate in Western Europe and Switzerland and to define the environment in which they evolve and grow. Also, from the processing of the survey data we will find the intensity of the variables which affect company's decisions, but also the intensity of the variables describing the results of those decisions. Based on descriptive statistics we will comprehensively outline the extent of the practice of sustainable procurement in Western Europe, obtain data suited for comparison with prior and future relevant international surveys of the prevailing trends and draw initial conclusions about their tactic or strategic nature.

In the second phase, using the method of principal components factor analysis (principal components analysis) and the technique of orthogonal rotation maximum variance (Varimax Rotation), we will analyze factors in the variables related to the environment in which the sample companies operate and the variables positively or negatively affecting the decisions on sustainable procurement (incentives and threats). The use of the method of analysis in key factors in this current research attempts to reduce the large number of variables mentioned (33 variables) into a smaller number of factors of related

variables, which will help us better interpret the data and control the research hypotheses that we have set. Moreover it was our intention to create a new scale of self-evaluation in maturity of the SVP implementation process and to simplify the process. Before proceeding to the analysis into key factors, we will check the reliability of the variables selected for the factor analysis using the coefficient Cronbach's Alpha. Values of Cronbach's Alpha coefficient greater than 0.6 are considered as acceptable and over 0.8 as excellent for analysis (Churchill Jr, 1979). For factor analysis to be considered suitable as a statistical method for data analysis, the correlation coefficients between the examined variables should be high. If the correlations are low then it will be almost impossible for variables to be split over common factors. Also, partial correlation coefficients between pairs of variables should be low. The partial correlation coefficient between two variables measures the correlation between them after the removal of the influence of the remaining variables. To test the validity of the above conditions, and hence the appropriateness of the factor analysis as a statistical method for analyzing the data, we use the Barlett control test of sphericity and the Kaiser-Meyer-Olkin (KMO) test. The Barlett sphericity control test, using the statistic  $X^2$ , tests the hypothesis that the correlation matrix is not identitarian, i.e. that there are statistically significant correlations between variables and, therefore, that the model of factor analysis is appropriate. So, we need to have large values of  $X^2$  and rejection of the hypothesis that the correlation matrix is identitarian to accept the factor analysis as a method. Correspondingly, the KMO index test compares the sizes of the observed correlation coefficients to the partial correlation coefficients. When the values are greater than 0.6, the method of analysis is considered acceptable (Raftopoulos & Theodosopoulou, 2002). Next, for the selection of variables which comprise the factors, we will use the criterion of the factorial loading. Variables with a load of less than 0.4 will be dropped from further analysis. Finally, we will check the internal reliability of the factor analysis for each element, by controlling the coefficient Cronbach's

Alpha mentioned previously.

In the third and last phase of the statistical analysis of the data we will investigate the existence of correlations between variables that express the degree of utilization and success of sustainable procurement by companies operating in Western Europe and the factors that influence the positive or negative decision on sustainable procurement, as well as those factors that characterize the environment in which these companies operate. The analysis of correlations will be performed in order to verify the research hypotheses which we describe in the next [section 4.6](#). For these correlation checks we will use the rate  $r$  of Pearson, when the variables involved follow the normal distribution, and the  $\rho$  coefficient of Spearman where one of the variables involved does not follow the normal distribution. Checking normality of variables will be done using the Kolmogorov-Smirnov test.

Beginning from the demographics in order to get to know our sample, we present the identity of the respondents. In the following table 4.1 we show the consistency of the sample within each industry.

<b>Industry</b>	<b>Responds</b>	<b>Percentage</b>
<b>Food</b>	192	36,1%
<b>Beverages</b>	147	27,6%
<b>Food &amp; Beverages</b>	193	36,3%
<b>Total</b>	<b>532</b>	<b>100,0%</b>

**Table 4.1:** Sample Consistency within Food and Beverage Industry Areas

Source: R. Lacroix et al 2015 ©

The list of the surveyed companies which belong exclusively to the food industry, exclusively to the beverage industry, as well as those which belong to both food and beverage industry can be found in [Appendix I.2](#).

The following table 4.2 shows information about the origin of the data collected:

Country	Responses	Percentage
Austria	21	4%
Belgium	47	9%
Denmark	48	9%
Finland	27	5%
France	83	16%
Germany	33	6%
Greece	8	2%
Ireland	15	3%
Italy	28	5%
Luxembourg	6	1%
Netherlands	28	5%
Norway	29	5%
Portugal	24	5%
Spain	50	9%
Sweden	25	5%
Switzerland	38	7%
UK	21	4%
Other	1	0%
<b>TOTAL</b>	<b>532</b>	<b>100%</b>

**Table 4.2:** Countries Where Data Was Collected

Source: R. Lacroix et al 2015 ©

Note that the majority of the sample is spread over the following 4 countries: France, Spain, Denmark and Belgium and lesser participation by other countries.

#### Size of the Company

In the following table 4.3 we can observe the consistency of our sample by number of responses and percentage, in terms of company size.

Size Clusters (Number of employees)	Responses	Percentage
Small (<50)	289	54,3%
Medium (50-249)	140	26,3%
Large (>250)	103	19,4%
<b>Total</b>	<b>532</b>	<b>100,0%</b>

**Table 4.3:** Sample Consistency By Company Size

Source: R. Lacroix et al 2015 ©

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#### 4. Research Methodology & Quantitative Statistical Analysis

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In the following table 4.4 we can observe the percentage of responses received by position in the company.

##### Percentage of the respondents profile by position

Position/Department of the responder	Responses	Percentage
CEO Owner General Manager	266	50,0%
TQM SCM Logistics Procurement	162	30,5%
Sales Marketing & HR	48	9,0%
Finance	23	4,5%
Other	33	6,0%
<b>Total</b>	<b>532</b>	<b>100,0%</b>

**Table 4.4:** Percentage of Responses by Hierarchical Position

Source: R. Lacroix et al 2015 ©

In the following table 4.5 we can see a Cross tabulation between company size and position of the respondent.

SVP Decision Making by Management Function	Company Size		
	Large (250+)	Medium (50-249)	Family owned & Small (10-49)
General Manager, Owner, CEO of (268)	0	0	268
TQM, SCM, Logistics, Procurement of (163)	83	80	0
Sales & Marketing of (48)	18	30	0
Finance of (23)	2	21	0
Other (Accounting, Legal, Administrative, etc.) of (30)	0	9	21
<b>Total of (532)</b>	<b>103</b>	<b>140</b>	<b>289</b>

**Table 4.5:** Company Size and SVP Decision Making by Management Function of the Respondents

Source: R. Lacroix et al 2015 ©

In the following table 4.6 we can see the coding assignment of Questions for data processing.

Your company has published an Environmental Policy describing its mission	<b>a09</b>
Your company has tools/metrics which an auditor could use to measure/verify the implementation of the Environmental Policy	<b>a10</b>
Suppliers are contractually required to abide to your Environmental Policy.	<b>a11</b>
Suppliers' compliance with your Environmental Policy is verified yearly and cooperation or verification measures are in place to guarantee conformity.	<b>a12</b>
Your Environmental Policy goals/claim have increased your exposure to risk.	<b>a13</b>
Your Environmental achievements have improved your brand(s) image and strengthened customer loyalty.	<b>a14</b>
Your Environmental Policy by its implementation has resulted in fewer Lawsuits.	<b>a15</b>
The Press has regarded favorably your Environmental policy initiatives.	<b>a16</b>
Annual Stockholder Meetings/Owners have supported your board's long term Environmental Strategy and Policy.	<b>a17</b>
Your competition endorses and practices Ethical Business Practices	<b>a18</b>

#### 4. Research Methodology & Quantitative Statistical Analysis

Your company innovates and is a thought leader with Research and Development (R&D) which contributes to best practices and standards in the Market.	<b>a19</b>
Your company teams with organizations in performing research to learn about consumers through market surveys and interviews and to develop future products.	<b>a20</b>
Your company procurement function cooperates with competitors in setting common standards of supplies requirements to achieve discounts.	<b>a21</b>
Your company has a Total Quality Management (TQM) Program or Quality culture in place, invests in Innovation Research, and has reduced costs and improved operations.	<b>a22</b>
Your company is a preferred employer for experienced professionals and graduates and has a sustainable family culture. Employees that deliver exceptional customer service, and top quality products and services are rewarded.	<b>a23</b>
As a procurement officer or senior management professional do you understand “sustainable value procurement” (SVP).	<b>a24</b>
Employees involved in the procurement process been trained in SVP.	<b>a25</b>
Suppliers involved in the procurement process been trained in SVP.	<b>a26</b>
Marketing has taken advantage of SVP to enhance the brand image on the packaging.	<b>a27</b>
Advertising has taken advantage of some SVP message to enhance the brand image and sales with customers.	<b>a28</b>
Packaging or labeling BIO or other local traditional or Fair Trade quality standard claims and green colors are preferred by customers.	<b>a29</b>
Reduced or Recycled Packaging or use of more environmental friendly packaging material and shape are preferred by customers.	<b>a30</b>
Your SVP product initiatives have resulted in increased Sales.	<b>a31</b>
Non Governmental Organizations (NGO's) report favorably on our company's environmental claims.	<b>a32</b>
Stock Market and Investors report favorably on our company's environmental initiatives.	<b>a33</b>
Consumer Advocacy Groups (CAG's) report favorably on our company's environmental initiatives.	<b>a34</b>
Independently Surveyed Customers share common environmental values.	<b>a35</b>
Legislation favors SVP conformity in Packaging and Product Labels.	<b>a36</b>
Customer's choice is influenced in their purchasing decisions by your Environmental policy and SVP initiatives.	<b>a37</b>
Customers are willing to pay something extra for an environmental/social friendlier choice.	<b>a38</b>
SVP offers limited Value Added to consumers as a company's purpose is profit at any cost and does not make sense for some products and services.	<b>a39</b>
Special certified labels such as: Bio, Organic, Max Havelaar, Product of ...(region), All Natural, Traditional, etc, are preferred by customers	<b>a40</b>
Competitors that practice SVP are preferred by customers and do well for those SVP products.	<b>a41</b>

**Table 4.6:** Coding Assignment of Survey Questions for data processing.

Source: R. Lacroix et al 2015 ©

### Recoding

Before processing and analyzing the collected data, we must be sure that our scale is following the same direction. Since questions a13 and a39 have a negative meaning, every agreement is evaluated as disagreement and vice versa. By recoding we produce questions a13op and a39op, where they are reversed, fitting our scale.

#### **4.6 Research Hypotheses**

The Research hypotheses for this Dissertation are broken down into two sections: Section A for the whole sample and section B for SMEs.

Many Journal articles discuss sustainable procurement, however none focused on the relationships between sustainable procurement market leaders in the food and beverage industry and their investment in training, their TQM practices, their innovations, and how SP packaging and labeling adds value to consumers. Hypotheses that apply to the whole sample are listed in section A, while Hypothesis which apply to SMEs are listed in section B below.

Section A: The four hypotheses retained for exploration in this thesis for the whole sample are the following:

##### **Hypothesis 1**

-Ho: The companies-leaders in the field of sustainable procurement invest in specialized training of their staff on issues of sustainable development.

-Ha: The companies-leaders in the field of sustainable procurement do not invest in specialized training of their staff on issues of sustainable development.

##### **Hypothesis 2**

-Ho: The companies-leaders in the field of sustainable procurement are also leaders in the field of TQM.

-Ha: The companies-leaders in the field of sustainable procurement are not also leaders in the field of TQM.

### **Hypothesis 3**

-Ho: The companies who are leaders in the field of sustainable procurement are those characterized by innovations.

-Ha: The companies who are leaders in the field of sustainable procurement are not those characterized by innovations.

### **Hypothesis 4**

-Ho: The investment in sustainable packaging and labeling offers no added value to consumers

-Ha: The investment in sustainable packaging and labeling offers added value to consumers

Section B: The six hypotheses retained for exploration in this thesis for SMEs are the following:

### **SME Hypothesis 1**

**Ho: SMEs that practice SP have an environmental policy and they contractually require their suppliers to abide by their environmental policy. Or the reverse that**

**Ha: SMEs that practice SP and have an environmental policy do not require their suppliers to abide by their environmental policy.**

### **SME Hypothesis 2**

**Ho: SMEs verify at least once a year the conformity of their suppliers with their environmental policy requirements. Or the reverse – that**

**Ha: SMEs do not verify at least once a year the conformity of their suppliers with their environmental policy requirements.**

### **SME Hypothesis 3**

**Ho: SMEs are providing innovative green products. Or the reverse – that**

**Ha: SMEs are not providing innovative green products.**

#### **SME Hypothesis 4**

**H0: SMEs that practice Sustainable Procurement apply TQM principles in their operations and invest in training of their employees. Or the reverse that**

**Ha: SMEs, that practice Sustainable Procurement do not apply TQM principles in their operations and do not invest in training of their employees.**

#### **SME Hypothesis 5**

**Ho: SMEs, which have tools and metrics to measure SP results, estimate they are profitable. Or the reverse that**

**Ha: SMEs, that do not tend to have tools and metrics to measure SP results estimate they are not profitable.**

#### **SME Hypothesis 6**

**Ho: SMEs, who estimated they had increased sales, also trained their employees in SP, and their suppliers received training in SP. Or the reverse that**

**Ha: SMEs, who estimate they did not have increased sales and did not train their employees in SP, or their suppliers did not train their employees in SP.**

Before checking these hypotheses and for correlations between variables, we

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need to identify if our sample follows a normal or a non-normal distribution. The process of normality testing is described by detail in [Appendix I.3](#).

We observe the results of the Kolmogorov-Smirnov (KS) test and the Shapiro-Wilk (SW) tests as presented in this table. The SPSS output table below shows that with degree of freedom (df) 532 (the number of collected survey responses) for both tests all significance value (sig) are below 0,05 for all variables, thus demonstrating that the data for each variable do not follow a normal distribution, which is quite common in large samples (Streiner, D. L. (2003). Being inconsistent about consistency: When coefficient alpha does and doesn't matter. *Journal of Personality Assessment*, 80(3), 217-222).

**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
a09	,406	532	,000	,564	532	,000
a10	,173	532	,000	,868	532	,000
a11	,310	532	,000	,747	532	,000
a12	,325	532	,000	,721	532	,000
a14	,412	532	,000	,584	532	,000
a15	,395	532	,000	,658	532	,000
a16	,395	532	,000	,607	532	,000
a17	,466	532	,000	,444	532	,000
a18	,409	532	,000	,621	532	,000
a19	,160	532	,000	,886	532	,000
a20	,338	532	,000	,732	532	,000
a21	,276	532	,000	,811	532	,000
a22	,260	532	,000	,795	532	,000
a23	,221	532	,000	,879	532	,000
a24	,414	532	,000	,548	532	,000
a25	,224	532	,000	,848	532	,000
a26	,185	532	,000	,892	532	,000
a27	,246	532	,000	,816	532	,000
a28	,260	532	,000	,803	532	,000
a29	,469	532	,000	,444	532	,000
a30	,430	532	,000	,488	532	,000

a31	,289	532	,000	,751	532	,000
a32	,383	532	,000	,646	532	,000
a33	,398	532	,000	,594	532	,000
a34	,447	532	,000	,575	532	,000
a35	,442	532	,000	,497	532	,000
a36	,477	532	,000	,423	532	,000
a37	,417	532	,000	,557	532	,000
a38	,497	532	,000	,307	532	,000
a40	,491	532	,000	,332	532	,000
a41	,431	532	,000	,523	532	,000
a13op	,482	532	,000	,391	532	,000
a39op	,504	532	,000	,302	532	,000

a. Lilliefors Significance Correction

## Correlations

SPSS “discovered” some questions which have a high correlation which can be summarized as follows:

A company’s perceived value in the eyes of the consumer has much to do with the brand image of the companies (question 14). Thus, based on the “Brand image” of a company, we discover in practice that companies that have a good/very good brand image are also the ones with the lesser lawsuits (question 15) possibly because they tend to abide by the strict legislation requirements and tend to do even more than required with regards to compliance, thus they are well graded with regards to perceived value [[See note to question 15](#)]. Having less lawsuits has the obvious benefit that the press tends to report favorably on a company accomplishments (question 16), and not surprisingly because a significant number of consumers tend to be influenced by the “reviews and positive comments as several sociological studies have shown, (infomercials and advertizing/propaganda alike play a role in influencing consumers)” it is logical that this ultimately results in increased sales (question 31 about SVP increasing sales). Having said that the



favorable press (question 16) not only influences favorably sales (question 31 as just mentioned) but has the “side-effect” of also influencing very positively what we may refer to as “Targeted consumer groups” (question 35 refers to these as “independently surveyed customers”) often with specific demographic and financial buying power characteristics or environmental/cultural habits education levels and beliefs classifications and customized scalar levels of sustainability expectations. Interestingly enough the company board of medium/ large companies or the owners of smaller companies (question 17) tend to approve initiatives and policies that are justified by a perceived consumer demand that could result in increased sales even when that entails a certain amount of uncertainty risk (lesser correlation question 13 of lesser company exposure to risk by these new policies). The policies having been approved by the decision makers, it is converted into action starting from the training of the procurement head and staff (question 24 which is strategic and to a lesser level of correlation question 25 having to do with training also the employees involved with SVP). Naturally in a supply chain world with suppliers spread across the planet objectives cannot be achieved without partners working together sharing a common strategy (question 25 with strong correlation where suppliers not unlike employees are also trained on SVP). These professionals are often part of future product planning teams and as demonstrated in practice (question 30 about reduced recycled packaging) bring about innovations which make business sense and save money to the companies. Once again the Independent surveyed consumers (question 35) seeing the result on the supermarket shelves comment positively when they are asked about the SVP practices of the best practice leader companies. Likewise the newly trained procurement executive (question 24) in practice as an advocate for sustainability within the firm, as shown by a strong correlation influences the bio/fair trade labeling of products (question 29) and the packaging selected for distribution (question 30) to achieve economies of scale by the company. Once again, the pallets of products and bulk packaging that ship to supermarket shelves as demonstrated by the samples strong correlations are once again viewed very positively by the independently surveyed consumers (question 35) but this time demonstrating the strong

correlation (question 37) that yes, consumers are indeed influenced by the policies, positive coverage and best practices in SVP as implemented by leader companies. Looking further, we discover that for large companies and some medium companies trading on the European and even the US stock markets for some EU companies, that there is a very strong correlation between the company use of standards in labeling (question 29) and the result of positive valuation results of company shares on the stock market (question 33) as side implications there are also two parallel strong correlations as indicated by the sample data (question 35 with independently surveyed consumers) that consumers are influenced by news of stock valuations and being influenced by companies. SVP initiatives as these tend to reinforce the “positive” image the consumers have for the brand image and perceived shared values (question 37 with customer choice being influenced by company SVP practices). To complete this image the sample data indicates strong correlations between reduced recycled packaging used (question 30) with the independently surveyed consumers positive light perception (question 35) and the choice of consumers being influenced by company SVP practices (question 37). These are once again confirmed in practice by increased sales (question 31) and stock market prices valuations being influenced by quarterly sales reports showing a growth/increase in sales and as a result these shares (question 33) notice increased demand and thus increased valuations. These newer valuations have a strong correlation also with the consumer advocacy groups (question 34) reporting favorably on the company and lastly (question 32 NGOs positive reporting) NGOs tend to report favorably on these leader trend setting companies thus with a strong correlation (question 33 stock market) further increasing the value of the shares on the stock market and making these shares more desirable for retirement fund investments.

Note on question 15: This accidently was noticed in follow-up interview questions where some large companies who are considered leaders explained that they innovate and set the standards with environmental considerations,

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they are one step ahead of legislation demands and work as to create a legal framework that protects the environment while not harming their business. These “long term” strategic companies are generally well perceived by the general public and tend to deliver on promises, commitments and quality expectations of consumers and thus because they go beyond compliance with quality policies with their suppliers throughout the supply chain, they can justify a higher cost while offering “superior value” services to their mostly satisfied consumers who tend to stay loyal and more forgiving with them than with less innovative competition.

**Section A Hypotheses testing (for the whole sample):**

**Hypothesis 1**

-Ho: The companies-leaders in the field of sustainable procurement invest in specialized training of their staff on issues of sustainable development.

-Ha: The companies-leaders in the field of sustainable procurement do not invest in specialized training of their staff on issues of sustainable development.

		a25	a19
Spearman's rho	Correlation Coefficient	1,000	,433**
	a25 Sig. (2-tailed)	.	,000
	N	532	532
	Correlation Coefficient	,433**	1,000
	a19 Sig. (2-tailed)	,000	.
	N	532	532

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Ho accepted since there is strong inner correlation between these two variables.

## Hypothesis 2

-Ho: The companies-leaders in the field of sustainable procurement are also leaders in the field of TQM.

-Ha: The companies-leaders in the field of sustainable procurement are not also leaders in the field of TQM.

			SVP_strategy	a22
Spearman's rho		Correlation Coefficient	1,000	,411**
	SVP_strategy	Sig. (2-tailed)	.	,000
		N	532	532
a22		Correlation Coefficient	,411**	1,000
	SVP_strategy	Sig. (2-tailed)	,000	.
		N	532	532

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Ho accepted since there is a strong correlation between the SVP strategy leaders and TQM leaders.

## Hypothesis 3

-Ho: The companies who are leaders in the field of sustainable procurement are those characterized by innovations.

-Ha: The companies who are leaders in the field of sustainable procurement are not those characterized by innovations.

			innovation	SVP_strategy
Spearman's rho		Correlation Coefficient	1,000	,544**
	innovation	Sig. (2-tailed)	.	,000
		N	532	532
SVP_strategy		Correlation Coefficient	,544**	1,000
	innovation	Sig. (2-tailed)	,000	.
		N	532	532

	Sig. (2-tailed)	,000	.
	N	532	532

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The bond between innovation and SVP is confirmed by the inner correlation of these two major factors.

**Hypothesis 4**

-Ho: The investment in sustainable packaging and labeling offers no added value to consumers

-Ha: The investment in sustainable packaging and labeling offers added value to consumers

**Correlations**

		packaging_labeling	SVP_customer_value
Spearman's rho	Correlation Coefficient	1,000	,543**
	packaging_labeling Sig. (2-tailed)	.	,000
	N	532	532
	Correlation Coefficient	,543**	1,000
	SVP_customer_value Sig. (2-tailed)	,000	.
	N	532	532

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Ho rejected, since these two factors have significant correlation at the 0.01 level.

**Section B Hypotheses testing (for SMEs):**

For all six hypotheses discussed in this section we used the correlations information generated by SPSS which is available in Appendix C: SPSS 20 Table describing the correlations between variables used in the survey of 429 Food and Beverage SMEs. For easier readability we highlighted the correlations in the table to paint the cells using three colors. Yellow indicates a high correlation between two variables, Green indicates a low correlation and Blue indicated that there is no valid correlation between two variables. Because we are aware that Sustainable procurement is profitable and adds

value to large companies, we wanted to confirm that some SMEs also practice Sustainable procurement like large companies. Further, we wanted to confirm that SMEs also derive benefits from their implementation of Sustainable procurement thus being profitable is not necessarily related to the company size. In the most-recent literature, there are indications that SMEs are getting more integrated with global supply chains. When it comes to requirements compliance, you see multinational buyers imposing environmental and social requirements on SMEs (Jorgensen & Knudsen, 2006). SMEs in turn impose these requirements on their suppliers. This situation brings about social and economic benefits according to Helen Walker. "Buying from small businesses can make contributions in a variety of forms, ranging from a contribution to local economic development through providing innovative green products and services, particularly in the food sector" (Walker 2009). We wanted to identify the targeted population of "environmental conscious" SMEs from an extended process which we describe in the methodology, we retained only SMEs that have an environmental policy.

From these companies we wanted to learn the following answers to our six hypotheses listed as H1 through H6.

**H1 SMEs that practice SP have an environmental policy and they contractually require their suppliers to abide by their environmental policy. Or the reverse that SMEs that practice SP and have an environmental policy do not require their suppliers to abide by their environmental policy.** The SPSS 20 spearman rho (sig. 2 -tailed) correlations table with N=429 of variables P1 (Have an Environmental Policy), and D2 (Supplier verified to conform to environmental policy) is 0,293\*\* indicating that these are highly correlated at the 0,01 significance level. The preliminary hypothesis confirms that surveyed SMEs tell us they strongly agree and that they contractually require their suppliers to abide by their environmental policy and that they verify this at least once a year.

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**H2 SMEs verify at least once a year the conformity of their suppliers with their environmental policy requirements. Or the reverse – that SMEs do not verify at least once a year the conformity of their suppliers with their environmental policy requirements.** The SPSS 20 spearman rho (sig. 2-tailed) correlations table with N=429 of variables P1 (Have an Environmental Policy), and D2 (Supplier verified to conform to environmental policy) is 0,293\*\* indicating that these are highly correlated at the 0,01 significance level. The preliminary hypothesis that surveyed SMEs tells us they strongly agree and that they contractually require their suppliers to abide by their environmental policy and that they, verify this conformity at least once a year.

**H3 SMEs are providing innovative green products. Or the reverse – that SMEs are not providing innovative green products.** The SPSS 20 spearman rho (sig. 2-tailed) correlations table with N=429 of variables D4 (You practice SP Innovation) in relationship with variables D1 (Employees trained in SP) 0,403\*\* and P3 (Employees have an SP Culture) 0,398\*\* are linked to having deployed tools and Metrics to measure SP performance (Variable C2) 0,369\*\*. They are also linked to performing R&D for future products (Variable A2) 0,352\*\* and the SME estimation of increased sales (variable P4 SP increases sales) 0,295\*\*. These variables are highly correlated at the 0,01 significance level, thus confirming the preliminary hypothesis that SMEs are providing innovative green products and that they those which do estimate they have increased sales.

**H4 SMEs that practice Sustainable Procurement apply TQM principles in their operations and invest in training of their employees. Or the reverse that SMEs, that practice Sustainable Procurement do not apply TQM principles in their operations and do not invest in training of their employees.** The SPSS 20 spearman rho (sig. 2-tailed) correlations table with N=429 of variables A1 (Have TQM innovation infrastructure), and C2 (have deployed tools and Metrics to measure SP performance) 0,482\*\* and D1 (Employees are trained in SP) 0,244\*\*, and P3 (have a sustainable procurement culture) 0,296\*\* confirm the preliminary hypothesis that the most advanced of SMEs, that practice Sustainable Procurement apply TQM

principles in their operations and invest in SP training of their employees.

**H5 SMEs, which have tools and metrics to measure SP results, estimate they are profitable. Or the reverse that SMEs, that do not tend to have tools and metrics to measure SP results estimate they are not profitable.**

The SPSS 20 spearman rho (sig. 2-tailed) correlations table with N=429 of variables C2 (SMEs have tools and Metrics to measure SP performance) in relationship to P3 (employees have an SP culture) 0,489\*\*. Additionally variables A1 (use a TQM innovation infrastructure) 0,482\*\* and D1 (employees were trained in SP) 0,389\*\* and D4 (practice SP innovation) 0,369\*\* and A3 (perform R&D for future products) 0,323\*\* and P4 (Sustainable procurement initiatives estimated to have increased sales) 0,297\*\* all confirm a high correlation amongst themselves. The preliminary hypothesis confirms that SMEs that have tools and metrics to measure SP results estimate they had increased sales. Some SMEs, which indicated they did not have tools and metrics for SP, indicated that they estimated they were profitable. All SMEs claiming they have had tools and metrics to measure SP and which stated they performed SP innovation said they used common industry standards and estimate they were profitable (they answered four; five on lickert-5 scale converted to yes). These were also found to having also answered that they had previously trained their employees in SP (D1 with P4 relationship) 0,456\*\* at the 0,01 significance level.

**H6 SMEs, who estimated they had increased sales, also trained their employees in SP, and their suppliers received training in SP. Or the reverse that SMEs, who estimate they did not have increased sales and did not train their employees in SP, or their suppliers did not train their employees in SP.** The SPSS 20 spearman rho (sig. 2-tailed) correlations table with N=429 of variables D1 (employees trained in SP) and D3 (supplier trained in SP) 0,497\*\* and P4 (estimate they are profitable) 0,456\*\* indicate strong correlations at the 0,01 significance level. These correlations confirm the initial hypothesis that SMEs which had trained their employees in SP and whose



suppliers had done the same, they estimated they had achieved increased sales.

#### 4.7 Reliability Analysis of Scale: Cronbach-Alpha

We open our data file and the first thing we do is to make our variables compatible for analysis. Thus, we have to recode variables 13 and 39 into 13op and 39op due to the questions' opposite meaning. In order to verify the reliability of our questions model on our sample and our topic we used the Cronbach Alpha method.

In the reliability analysis process we exclude demographic questions and the optional question 45 (exclude questions 2, 5,6,7,42,45) and questions 13 and 39 that are rotated and the three switches size1,size2,size3 used to identify small, medium, large companies from our sample.

### Reliability

#### Scale: ALL VARIABLES

Reliability Statistics

Cronbach's Alpha	N of Items
,920	33

The SPSS analysis of our sample generates a Cronbach alpha of 0,92 which is considered very good according to theory (Streiner, 2003, "Starting at the Beginning: An Introduction to Coefficient Alpha and Internal Consistency" (*J. of Personality Assessment v. 80 no. 1 p. 99-103*)).

Now let's look at the possible organization of these groups of questions in order to derive factors.

UCLA explanation of Factor analysis as we have performed here (we quote):

"Factor analysis is a method of data reduction. It does this by seeking underlying unobservable (latent) variables that are reflected in the observed

variables (manifest variables). There are many different methods that can be used to conduct a factor analysis (such as principal axis factor, maximum likelihood, generalized least squares, unweighted least squares), There are also many different types of rotations that can be done after the initial extraction of factors, including orthogonal rotations, such as varimax and equimax, which impose the restriction that the factors cannot be correlated, and oblique rotations, such as promax, which allow the factors to be correlated with one another. You also need to determine the number of factors that you want to extract. Given the number of factor analytic techniques and options, it is not surprising that different analysts could reach very different results analyzing the same data set. However, all analysts are looking for simple structure. Simple structure is pattern of results such that each variable loads highly onto one and only one factor.

Factor analysis is a technique that requires a large sample size. Factor analysis is based on the correlation matrix of the variables involved, and correlations usually need a large sample size before they stabilize. Tabachnick and Fidell (2001, page 588) cite Comrey and Lee's (1992) advice regarding sample size: 50 cases is very poor, 100 is poor, 200 is fair, 300 is good, 500 is very good, and 1000 or more is excellent. As a rule of thumb, a bare minimum of 10 observations per variable is necessary to avoid computational difficulties.

For the example below, we are going to do a rather "plain vanilla" factor analysis. We will use iterated principal axis factor with three factors as our method of extraction, a varimax rotation, and for comparison, we will also show the promax oblique solution. The determination of the number of factors to extract should be guided by theory, but also informed by running the analysis extracting different numbers of factors and seeing which number of factors yields the most interpretable results.”

Source: Introduction to SAS. UCLA: Statistical Consulting Group.  
from <http://www.ats.ucla.edu/stat/sas/notes2/> (accessed November 22, 2014).

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### **Factor split scenario**

Before running the factor analysis, an estimation was made from our experience and expectations. The questions have been organized based on categories of assumed value to the consumer. These three categories are organized as described below.

#### Group 1: “Perceived Customer Sustainability Value”

Addressing the consumer desires, aspirations and beliefs for the environment and sustainability regardless with how this perception can be tied or not with future sales. The “current” and evolving definition of sustainability is influenced by the education of the consumer and their experience with the products. As the consumer’s experience increases, so their requirements become better defined and more realistic and affordable. The 8 candidate questions for this category are:

Subgroup – sustainability company image based on questions:

32 NGOs,

33 Stock Market

34 Customer Advocacy Groups

35 Independently Surveyed Consumers

Subgroup - Results of sustainability

31 increased sales due to SVP

37 consumer influenced by company SVP efforts

38 consumers willing to pay more for SVP “value added offering”

39 SVP confirmed it is not of limited Added value

(optional question 41 consumers that practices SVP do well = meaning have increased sales)

#### Group 2: “Environmental Policy and sustainability value creation”

Addressing how the environmental policy as a tool creates the framework to create value for the consumer. As a policy is deployed by a company, a strategy is developed and endorsed by decision makes, monitored and

improved upon to achieve success. Success is measurable as achieved by sales and loyalty by the consumers in the 3<sup>rd</sup> group. Group 2 has 11 questions.

Subgroup – sustainability planning – infrastructure set-up:

17 Env policy – strategy approved by decision makers/owners/company board

09 published Environment policy

27 training employees in SVP

28 training suppliers in SVP

11 Supplier contractual requirements

12 Supplier Audits

Subgroup – sustainability implementation measurement:

10 Environmental Metrics

13 Exposure to risk

14 brand image

15 less lawsuits

16 press favorable

Group 3: “TQM, Innovation/Best practices and higher Value creation “

Addressing how best practices create value for the consumer. Success is measurable as achieved by sales and loyalty by the consumers. Group 3 has 13 questions.

Subgroup – sustainability Research Theory and old best practices:

24 training Chief Procurement Officer

25 Training Staff

26 Training Suppliers

22 TQM program in place

Subgroup – sustainability Applied and current best practices:

20 Research performed

19 Innovations

29 labeling

30 packaging

40 bio/Max Havelar/organic preferred

Subgroup – CSR sustainability, Standards and future best practices:

23 company culture

18 competitors Ethical

21 cooperation with competitors for standards creation and cost reductions

42 making sustainability even easier to understand in the future

Now we are starting the factor analysis from SPSS

**Factor Analysis**

**Descriptive Statistics**

	Mean	Std. Deviation	Analysis N
a09	4,61	,732	532
a10	3,03	1,457	532
a11	4,22	1,032	532
a12	4,21	1,128	532
a14	4,62	,702	532
a15	4,51	,773	532
a16	4,45	,990	532
a17	4,68	,813	532
a18	4,41	1,042	532

a19	3,31	1,336	532
a20	1,98	1,330	532
a21	2,28	1,381	532
a22	2,77	1,673	532
a23	3,55	,981	532
a24	4,60	,790	532
a25	3,90	1,072	532
a26	3,57	1,145	532
a27	4,06	1,018	532
a28	4,03	1,113	532
a29	4,69	,792	532
a30	4,61	,879	532
a31	4,26	,947	532
a32	4,50	,808	532
a33	4,49	,940	532
a34	4,63	,696	532
a35	4,61	,895	532
a36	4,65	,942	532
a37	4,37	1,242	532
a38	4,81	,653	532
a40	4,78	,737	532
a41	4,66	,704	532
a13op	4,77	,652	532
a39op	4,82	,637	532

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,938
Approx. Chi-Square		8573,621
Bartlett's Test of Sphericity	df	528
	Sig.	,000

According to UCLA: “**Kaiser-Meyer-Olkin Measure of Sampling Adequacy** - This measure varies between 0 and 1, and values closer to 1 are better. A value of .6 is a suggested minimum”.

According to UCLA: “**Bartlett's Test of Sphericity** - This tests the null hypothesis that the correlation matrix is an identity matrix. An identity matrix is

matrix in which all of the diagonal elements are 1 and all off diagonal elements are 0. We want to reject this null hypothesis. Taken together, these tests provide a minimum standard which should be passed before a factor analysis (or a principal components analysis) should be conducted”.

UCLA: Statistical Consulting Group. (<http://www.ats.ucla.edu/stat/sas/notes2/> (accessed November 22, 2014)).

Rotated Component Matrix<sup>a</sup>

	Component					
	1	2	3	4	5	6
a17	,808					
a30	,805					
a24	,804					
a29	,763					
a35	,760					
a37	,727					
a16	,673					
a18	,670					
a33	,641					
a36	,585					
a28	,556					
a31	,553					
a15		,678				
a34		,627				
a14		,609				
a26		,598				
a27		,558				
a25		,525				
a23		,491				
a20			,836			
a21			,773			
a22			,710			
a10			,589			
a19			,566			
a11				,803		
a12				,704		
a09				,497		
a38					,740	
a32					,512	

a13op						,503	
a41						,468	
a39op							,833
a40							,587

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

On the above table we can observe the extract of the factor analysis after the Varimax rotation. This mode gives us the image of the group of 33 variables separated into 6 different categories, as well as the impact of its variable upon the factor, the factor loadings.

Statistical results for the entire survey sample

Six Factors Explained:

**Factor 1 – SVP strategic, Tactical and operational Procedures (customer focus/responsibilities)**

17- Annual Stockholder Meetings/Owners have supported your board's long term Environmental Strategy and Policy.

30 - Reduced or Recycled Packaging or use of more environmental friendly packaging material or shape are preferred by customers.



24 - As a procurement officer or senior management professional do you understand “sustainable value procurement” (SVP)?

29 - Packaging or labeling BIO or other local traditional or Fair Trade quality standard claims and green colors are preferred by customers.

35 - Independently Surveyed Customers share common environmental values.

37 - Customer's choice is influenced in purchasing decisions by your Environmental policy and SVP initiatives.

16 - The Press has regarded favorably your Environmental policy initiatives.

18 - Your competition endorses and practices Ethical Business Practices.

33 - Stock Market and Investors report favorably on our company's environmental initiatives.

36 - Legislation favors SVP conformity in Packaging and Product Labels.

28 - Advertising has taken advantage of some SVP message to enhance the brand image and sales with customers.

31 - Your SVP product initiatives have resulted in increased Sales.

#### **Factor 2 – Customers satisfaction and brand loyalty**

15 - Your Environmental Policy by its implementation has resulted in less Lawsuits.

34 - Consumer Advocacy Groups (CAG's) report favorably on our company's environmental initiatives.

14 - Your Environmental achievements have improved your brand(s) image and strengthened customer loyalty.

26 - Suppliers involved in the procurement process been trained in SVP?

27 - Marketing has taken advantage of SVP to enhance the brand image on the packaging.

25 - Employees involved in the procurement process been trained in SVP?

23 - Your company is a preferred employer for experienced professionals and graduates and has a sustainable family culture. Employees that deliver exceptional customer service and top quality products and services are rewarded.

**Factor 3 – SVP System Performance (Quality, Innovation, Satisfaction)**

20 - Your company teams with organizations in performing research to learn about consumers through market surveys and interviews and to develop future products.

21 - Your company procurement function cooperates with competitors in setting common standards of supplies requirements to achieve discounts.

22 - Your company has a Total Quality Management (TQM) Program or Quality culture in place, invests in Innovation Research, and has reduced costs and improved operations.

10 - Your company has tools/metrics which an auditor could use to measure/verify the implementation of the Environmental Policy

19 - Your company innovates and is a thought leader with Research and Development (R&D) which contributes to best practices and standards in the Market.

**Factor 4 – supplier compliance with environmental policy**

11 - Suppliers are contractually required to abide to your Environmental Policy.

12 - Suppliers compliance with your Environmental Policy is verified yearly and cooperation or verification measures are in place to guarantee conformity.

09 - Your company has published an Environmental Policy describing its mission.

**Factor 5 – SVP Consumer Perceived Value (Confidence, and perceived**

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value)

38 - Customers are willing to pay something extra for an environmental/social friendlier choice.

32 - Non Governmental Organizations (NGO's) report favorably on our company's environmental claims.

13op - Your Environmental Policy goals/claim have decreased your exposure to risk.

41 - Competitors that practice SVP are preferred by customers and do well for those SVP products.

**Factor 6 – Derived consumer value of SVP from Bio, Organic, etc certified labels**

39op - SVP does not offer limited Value Added to consumers as a company's purpose is not just profit at any cost and does make sense for some products and services.

40 - Special certified labels such as: Bio, Organic, Max Havelaar, Product of...(region), All Natural, Traditional, etc, are preferred by customers

After the explanation of the derived factors, we evaluate the results of the test we performed, according to our experience and literature. Cronbach's  $\alpha$  result for the whole sample 0,92 is excellent, which allows us to zoom in those 33 variables. Moreover, in the factor analysis above, while SPSS identifies particular groups, some items, based on experience cannot be logically combined and explained inside a factor as the program initially recomands. In order to reveal a more accurate and particular image of the companies involved, we split the questionnaire in two different parts, as it was issued to our respondents.

Thus we examine separately the first part with 15 variables based on the internal environment of the company and the second with 18 variables based on the external environment, and on customers in particular.

Following the same steps of analysis as above, we wanted to create smaller and easier to process scales.

## Reliability testing of the first part of variables

The first reliability test after the separation includes the first 15 variables from 09 to 23 (part 2 of the questionnaire).

Cronbach's Alpha	N of Items
,825	15

The Cronbach's Alpha of 0,825 gives us the green light to continue, since it implies that our scale is viable. The column "Cronbach's Alpha if Item Deleted" shows us the reliability of the scale if we exclude each variable (0,830). The variable a13op would give us higher Alpha if deleted, preparing us about how we will move in the next analysis.

## Factor Analysis of the first part of variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,833
Approx. Chi-Square		2610,192
Bartlett's Test of Sphericity	df	105
	Sig.	,000

	Component			
	1	2	3	4
a20	,847			
a21	,759			
a22	,736			
a10	,642			
a19	,610			
a23	,477			
a17		,826		
a18		,764		
a16		,734		

a09		,473		
a14			,725	
a15			,692	
a11				,824
a12				,725
a13op				,455

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

After examining the outputs, it is a fact that the question 13, even if reversed, is bothering us more than helping us. The reliability test could be better if we exclude it and also it is not highly related with the factor that it was categorized by the program. This probably derives from the opposite meaning of the question, which might confuse the responders. Trying to give a solution and produce better output, we decided to run another set of the same test with absence of the item 13op.

### Reliability test of the first half (if 13op is deleted)

Cronbach's Alpha	N of Items
,830	14

Running again the reliability test we get a better Cronbach Alpha than before, as we expected.

### Factor Analysis of the first part of variables (if 13op is deleted)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,835
Approx. Chi-Square		2523,640
Bartlett's Test of Sphericity	df	91
	Sig.	,000

The KMO and Bartlett's Test shows small improvement, yet significant by the absence of a13op.

**Rotated Component Matrix<sup>a</sup>**

	Component			
	1	2	3	4
a20	,846			
a21	,771			
a22	,717			
a10	,618			
a19	,583			
a17		,837		
a18		,781		
a16		,707		
a09		,510		
a15			,739	
a14			,735	
a23			,490	
a11				,832
a12				,763

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

The factor analysis is a method that could separate the whole questionnaire into smaller categories, which makes easier the analysis and the measurement of the variables, and also reduces the power of the correlation and the covariance of the variables upon the reliability tests.

On the first part of the questionnaire, there were 15 variables, based on the inner environment of the company, providing exclusive information about the structure, operation and culture. In the beginning we run a Cronbach's alpha reliability test in order to monitor the efficiency of our scale. Afterwards, a factor analysis with principal components method is following.

### **Factors explained**

#### 4. Research Methodology & Quantitative Statistical Analysis

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##### Factor 1a: Innovation and Measurement

a20	Your company teams with organizations in performing research to learn about consumers through market surveys and interviews and to develop future products.	,846
a21	Your company procurement function cooperates with competitors in setting common standards of supplies requirements to achieve discounts.	,771
a22	Your company has a Total Quality Management (TQM) Program or Quality culture in place, invests in Innovation Research, and has reduced costs and improved operations.	,717
a10	Your company has tools/metrics which an auditor could use to measure/verify the implementation of the Environmental Policy	,618
a19	Your company innovates and is a thought leader with Research and Development (R&D) which contributes to best practices and standards in the Market.	,583

##### Reliability Statistics

Cronbach's Alpha	N of Items
,812	5

##### Factor 1b: Company sustainable profile

a17	Annual Stockholder Meetings/Owners have supported your board's long term Environmental Strategy and Policy.	,837
a18	Your competition endorses and practices Ethical Business Practices	,781
a16	The Press has regarded favorably your Environmental policy initiatives.	,707
a09	Your company has published an Environmental Policy describing its mission	,510

##### Reliability Statistics

Cronbach's Alpha	N of Items
,755	4

##### Factor 1c: Company's positive sustainable image

a15	Your Environmental Policy by its implementation has resulted in less Lawsuits.	,739
a14	Your Environmental achievements have improved your brand(s) image and strengthened customer loyalty.	,735
a23	Your company is a preferred employer for experienced professionals and graduates and has a sustainable family culture. Employees that deliver exceptional customer service, and top quality products and services are rewarded.	,490

##### Reliability Statistics

Cronbach's Alpha	N of Items
,635	3

#### Factor 1d: Supplier sustainability management

a11	Suppliers are contractually required to abide to your Environmental Policy.	,832
a12	Suppliers' compliance with your Environmental Policy is verified yearly and cooperation or verification measures are in place to guarantee conformity.	,763

#### Reliability Statistics

Cronbach's Alpha	N of Items
,604	2

We continue our analysis with the second part of the variables set (section 3 of the questionnaire).

#### Reliability testing of the second part of variables

#### Reliability Statistics

Cronbach's Alpha	N of Items
,907	18

#### Factor Analysis of the second part of variables

#### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	,933
Approx. Chi-Square	4454,078
Bartlett's Test of Sphericity	df
	153
	Sig.
	,000

#### Rotated Component Matrix<sup>a</sup>

	Component		
	1	2	3
a27	,762		
a25	,753		
a26	,734		
a31	,709		



#### 4. Research Methodology & Quantitative Statistical Analysis

a28	,564		
a33	,540		
a30		,740	
a24		,693	
a37		,674	
a35		,669	
a29		,666	
a40		,653	
a36		,602	
a39op		,473	
a38			,677
a41			,637
a32			,597
a34			,580

Extraction Method: Principal Component

Analysis.

Rotation Method: Varimax with Kaiser

Normalization.

a. Rotation converged in 6 iterations.

**Component Transformation Matrix**

Component	1	2	3
1	,677	,657	,331
2	-,725	,520	,452
3	,125	-,546	,829

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

According to UCLA: "Because we used an orthogonal rotation, this should be a diagonal matrix, meaning that the same number should appear in all three places along the diagonal. In actuality the factors are uncorrelated; however, because factor scores are estimated and there may be slight correlations among the factor scores" (<http://www.ats.ucla.edu/stat/sas/notes2/> (accessed November 22, 2014)).

After examining the outputs, we observe the same challenge as before with the variable a39op this time. The reliability test could be even better (0,910 instead of 0,907) if we exclude it. Moreover, as monitoring on communalities table, a39op has by far the smaller explanation through any factor. This might again derives from the opposite meaning of the question. In order to test how

the scale behaves without that item, we continue with another set of the same tests, after eliminating the variable a39op.

**Reliability test of the first half (if 39op is deleted)**

**Reliability Statistics**

Cronbach's Alpha	N of Items
,910	17

Now our scale has the optimum alpha score.

**Factor Analysis of the second part of variables (if 39op is deleted)**

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	,935
Approx. Chi-Square	4369,729
Bartlett's Test of Sphericity	df
	136
	Sig.
	,000

KMO and Bartlett's Test is also better than the previous one.

**Rotated Component Matrix<sup>a</sup>**

	Component		
	1	2	3
a30	,794		
a24	,750		
a29	,733		
a35	,718		
a37	,683		
a40	,635		
a36	,593		
a33	,500		
a26		,770	
a25		,743	

#### 4. Research Methodology & Quantitative Statistical Analysis

a27		,743	
a31		,671	
a28		,522	
a38			,687
a41			,636
a32			,605
a34			,570

Extraction Method: Principal Component

Analysis.

Rotation Method: Varimax with Kaiser

Normalization.

a. Rotation converged in 6 iterations.

#### Factor 2a: Customer's driven Packaging Label (sustainability impact)

A30	Reduced or Recycled Packaging or use of more environmental friendly packaging material and shape are preferred by customers.	,794
A24	As a procurement officer or senior management professional do you understand "sustainable value procurement" (SVP).	,750
A29	Packaging or labeling BIO or other local traditional or Fair Trade quality standard claims and green colors are preferred by customers.	,733
A35	Independently Surveyed Customers share common environmental values.	,718
A37	Customer's choice is influenced in their purchasing decisions by your Environmental policy and SVP initiatives.	,683
A40	Special certified labels such as: Bio, Organic, Max Havelaar, Product of ...(region), All Natural, Traditional, etc, are preferred by customers	,635
A36	Legislation favors SVP conformity in Packaging and Product Labels.	,593
A33	Stock Market and Investors report favorably on our company's environmental initiatives.	,500

#### Reliability Statistics

Cronbach's Alpha	N of Items
,894	8

#### Factor 2b: Implementation of SVP strategy

A26	Suppliers involved in the procurement process been trained in SVP.	,770
A25	Employees involved in the procurement process been trained in SVP.	,743
A27	Marketing has taken advantage of SVP to enhance the brand image on the packaging.	,743
A31	Your SVP product initiatives have resulted in increased Sales.	,671
A28	Advertising has taken advantage of some SVP message to enhance the brand image and sales with customers.	,522

**Reliability Statistics**

Cronbach's Alpha	N of Items
,832	5

Factor 2c: SVP customer value

A38	Customers are willing to pay something extra for an environmental/social friendlier choice.	,687
A41	Competitors that practice SVP are preferred by customers and do well for those SVP products.	,636
A32	Non Governmental Organizations (NGO's) report favorably on our company's environmental claims.	,605
A34	Consumer Advocacy Groups (CAG's) report favorably on our company's environmental initiatives.	,570

**Reliability Statistics**

Cronbach's Alpha	N of Items
,617	4

The extended and more detailed version of our tests and statistics could be found on [Appendix I.24](#)

#### 4.8 Statistical Results for SMEs

From the total population of 8560 SME companies matching these criteria, a set of 2210 (25,8 %) SMEs are selected by computer-assisted random sampling for use in the two pre-surveys and the one large final survey.

Pre-Survey 1 was sent to 200 companies where 67 (33.5% response rate)

(Cronbach's Alpha 0.8619 indicating a high correlation and reliability) were useable, no rejects. The feedback had the purpose to improve the clarity and reliability of the questions and contributed to improving the survey.

Pre-Survey 2 was sent again to the same 200 companies, obtained 76 (38%) valid responses (Cronbach Alpha 0,890 indicating a high correlation and

reliability) (the same 67 and some additional which we exclude for the purpose of comparing and computing reliability and correlation for the same SMEs).

In order to adequately answer the Hypotheses from our preliminary survey, we devised 33 questions organized in six thematic areas – demographics, organization, decision making, training, sales, R&D and Innovation. As mentioned in the previous section, these 33 questions applied to Large companies and SMEs in Western Europe in the Food and Beverage industry. 18 of these original 33 questions addressed sustainable procurement. While running a Cronbach alpha test on these 18 questions and taking advantage in SPSS version 20 and taking advantage of the function "if item deleted" we obtained an optimum group of thirteen (13) variables. These 13 variables are the ones classified and are available in Appendix A: Guttman Scalogram for Sustainable Procurement in Western European SMEs.

The details relating to the country of origin of these surveyed SMEs can be found in Appendix B: Table of SMEs surveyed on SP by Country and Industry.

The details of the correlations between these variables as generated from our survey data by SPSS can be found in Appendix C: SPSS 20 Table describing the correlations between variables used in the survey of 429 Food and Beverage SMEs.

Pre-roll-out Improvements: The Appearance and Graphics of the Survey web questionnaire were made more appealing, more straightforward to read and required less time to complete (approximately ten minutes). Three months later after testing and incorporating the last improvements suggested by our advisors we rolled out the final Survey. The feedback helped us add German and French versions of the English Survey together with a Glossary and instructions and common answers to questions respondents might have.

Main Survey was improved and sent to a total of 2210 companies, 532 Surveys were received (23.16% of 2210).

#### **SME Findings:**

While looking at the results of the 13 variables of appendix A, with the procedure as described in section "[7.1 SMEs Model Description](#)" we realized

they matched with the Shewart Wheel also known in the literature as Deming's PDCA cycle of Total Quality Management. Thus, variables 1-4 correspond to the "Plan" phase, variables 5-8 correspond to the "Do" phase, variables 9 -10 correspond to the "Check/Study" phase and variables 11-13 correspond to the "Act" phase of the Deming Cycle. While summarizing the survey results, we observed that the data collected conformed to the accepted procedures of the [Guttman Scalogram](#). The data showed that companies that reached the 4<sup>th</sup> and last phase also had reached the 3<sup>rd</sup> and the 2<sup>nd</sup> and the 1<sup>st</sup>. while those who reached phase 3 had previously answered yes to phases 2 and 1. Companies that reached phase 2 had also previously reached phase 1 without advancing any further. Finally, companies that did not complete all of phase 1 did not advance to complete any of the following steps while some of these having completed phase 1 partially completed some requirements of phase 2. In performing this analysis, we had to resolve a small problem, mainly that the data had been collected using Lickert -5 scale questions while the Guttman methodology requires dichotomies yes -no answers. In order to not lose any precision in the sample and avoid Simpson's paradox, we run all on all 5 elements of the Lickert scale for that data a reliability testing with Cronbach-alpha and factor analysis and showed there is a high correlation between these variables of the model. Only after doing these with the rigorous and accepted regression methods did we subsequently decide to reduce the data to dichotomous but only for the purpose of applying the hierarchical analysis. This is an accepted method for using dichotomization "because the distribution of the count variable is extremely highly skewed, to the extent that there is a large number of observations at the extreme score on the distribution" per MacCallum [123]. So we made the decision to convert all our Lickert 5 data by converting the 3-5 answers into "yes" and the 1 -2 answers as "no." Thus

obtaining the final 13 variables of our Guttman –like Scalogram as seen in Appendix A and serving as a base for our model<sup>1</sup>.

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<sup>1</sup> With regards to prior research having used this method, Guttman [93, 162] is the second to have used this approach, after Goodenough [92] and well known French Academician and Researcher Matalon [44] who advocated using this technique for skewed distributions. In Greece professor of Mathematics John Panagiotopoulos [136] made a related publication in the University of Piraeus Journal ΣΠΟΥΔΑΙ, and several PhDs in the 1980s/1990s used this technique as in Varlas [54].

Robert C. MacCallum who is professor at Ohio State University and who acts as a reviewer for 16 and is editor of another 7 journals " On the practice of Dichotomization of Quantitative Variables" in Psychological Methods 2002, Vol 7, No. 1, 19-40 [123] - on page 29 the author states that "Journals are known for their high standards, especially when statistical and methodological considerations are present" on page 30 the author while surveying articles published from 1998-2000 found that approximately 20% of these containing empirical studies in Journal of Personality and Social Psychology, Journal of Consulting and Clinical Psychology, and Journal of Counseling Psychology ..to name a few in his field "showed relatively frequent use of dichotomization", on page 38 of that same article he states "A second possible setting in which dichotomization might be justified involves the occasional situation where the distribution of a count variable is extremely highly skewed, to the extent that there is a large number of observations at the most extreme score on the distribution" and a few lines down "Corresponding dichotomization of the measured variable would yield a dichotomous indicator ... which may be useful for subsequent analyses", on page 34 he makes reference to a debate of an article according to Waller & Meehl in 1998 by Gangstad and Snyder (1985) using dichotomization which was argued against by Miller and Thayer in 1989, but in a subsequent article by Gangestad and Snyder (1991) the debate was won by the side advocating use of dichotomy. Finally Yarnold, P.R. [174] warns that dichotomization prior to data analysis with methods such as ANOVA could introduce Simpson's paradox for ordered bivariate data. In our analysis this risk was avoided because we performed the split after regression analysis thus avoided the data loss and negative effects of Simpson's Paradox. THIS METHOD DOES NOT LOSE ITS VALUE AND VALIDITY OVER TIME as in Uhlaner, L. M. (2005), «The Use of the Guttman Scale in Development of a Family Orientation Index for Small-to-Medium-Sized Firms». *Family Business Review*, 18: 41–56. doi: 10.1111/j.1741-6248.2005.00029.x [162] ; (as in the special case circumstance comment of MacCALLUM's stated above article on page 38).

## **5. Synthesis of Quantitative and Qualitative Interview Data**

### **5.1. Introduction**

The research conducted in this chapter as part of our thesis also includes the examination of small and family owned businesses. This is an important point to mention given that the majority of past sustainability research at European and international levels were either limited to one or fewer than 5 countries or included more countries but limited the sampling primarily to large or even medium-sized companies. In this study we consciously chose to innovate and our sample includes half (50%) of the statistical sample (17% large, 33% medium, 50% short) coming from small & family owned businesses, given their statistical importance versus larger enterprises size (more than 90% of Western-European businesses per country concerned are SMEs according to Eurostat as previously mentioned in the literature review chapter) and hence their importance and contribution to the GDP of Europe.

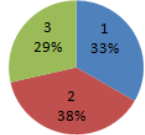
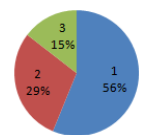
Questionnaires are an excellent tool to illustrate trends and offer proof of patterns amongst large samples, while qualitative interviews can reveal more in-depth information about participants' attitudes, thoughts, and actions (Kendall, 2008). Interviews can help validate previously collected data through surveys and hear opinions not otherwise captured through the survey. Hence, several authors have advocated that a more complete image can be gathered by researchers by combining the two methods for capturing trends and the in-depth information (as in mixed method studies investigating educational assessment , Brookhart & Durkin, 2003; Lai & Waltman, 2008) and in-line with the latest best practices in research (Harris L. & Brown G., (2010) we decided to combine techniques. The previous chapter represented the traditional Quantitative methodology as practiced in most Universities and this chapter offers the preview into the Qualitative elements of this research.



## 5.2 Surveyed Companies by Country and Category (Small/Family Owned, Medium, Large)

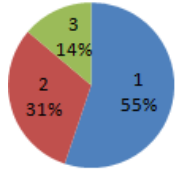
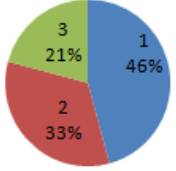
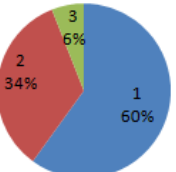
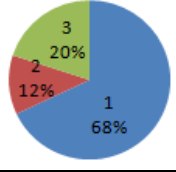
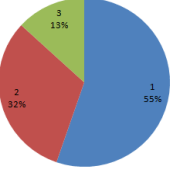
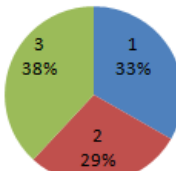
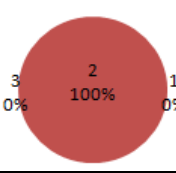
The thesis, given the large quantity and variety of collected data of answers, interviews and statistical information constitutes a comparative study between Western-European countries, but also between companies by size, offering a reliable picture (profile) of the prevailing situation in the region at the time of the data collection by country, and company size. This enables us to have a picture of the average company in the Western European region, with regards to its perception for sustainability, actions taken to achieve some experience and a response as to the sustainability standards widely used, all within the company's perception of their consumers value-added perspective.

The total estimated population of companies that comply with the standards of sustainability in the geography of Western Europe is estimated at 10,700 (ACCI database and sources from remaining Western-European chambers of commerce). We sent the questionnaire to 2600 companies (24.29%), completed responses from 641 (24.65 / 109 were rejected about 4, 19% of 2,600 or 17% of completed), completed with no errors and accepted 532 (20.46 in 2600 83% of total completed). 200 companies from those who gave valid responses, interviews were conducted (54% small accounted for ¼ and ¾ were medium sized) please see table 5.1 below.

	S&FO	M	L	Responses	% of Sample	Chart
Austria	7	8	6	21	0,04	
Belgium	33	10	4	47	0,09	
Denmark	27	14	7	48	0,09	

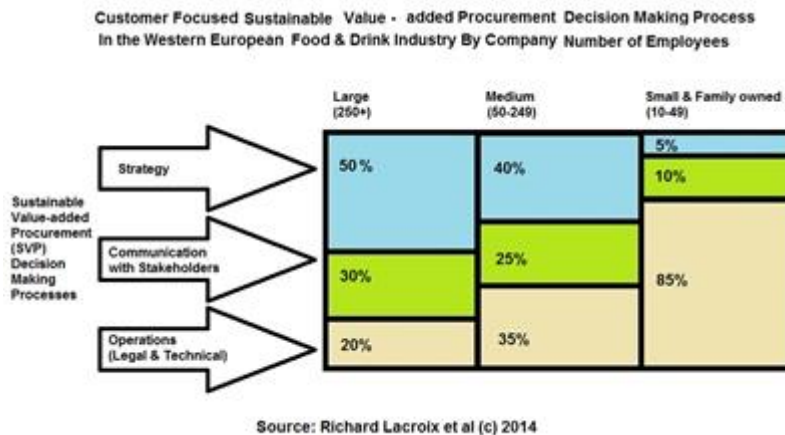
Value Added Sustainable Procurement Customer's Perspective as perceived by companies :  
 An Empirical Study of Western European Food and Beverage Companies.

Finland	19	2	6	27	0,05	<p>A pie chart for Finland showing three segments: a large blue segment representing 1 (70%), a green segment representing 2 (22%), and a small red segment representing 3 (8%).</p>
France	50	19	14	83	0,16	<p>A pie chart for France showing three segments: a blue segment representing 1 (60%), a red segment representing 2 (23%), and a green segment representing 3 (17%).</p>
Germany	6	8	19	33	0,06	<p>A pie chart for Germany showing three segments: a green segment representing 3 (58%), a red segment representing 2 (24%), and a blue segment representing 1 (18%).</p>
Greece	4	1	3	8	0,02	<p>A pie chart for Greece showing three segments: a blue segment representing 1 (50%), a green segment representing 3 (38%), and a red segment representing 2 (12%).</p>
Ireland	7	5	3	15	0,03	<p>A pie chart for Ireland showing three segments: a blue segment representing 1 (47%), a red segment representing 2 (33%), and a green segment representing 3 (20%).</p>
Italy	13	11	4	28	0,05	<p>A pie chart for Italy showing three segments: a blue segment representing 1 (47%), a red segment representing 2 (39%), and a green segment representing 3 (14%).</p>
Luxembourg	3	3	0	6	0,01	<p>A pie chart for Luxembourg showing three segments: a blue segment representing 1 (50%), a red segment representing 2 (50%), and a green segment representing 3 (0%).</p>
Netherlands	18	3	7	28	0,05	<p>A pie chart for Netherlands showing three segments: a blue segment representing 1 (64%), a green segment representing 3 (25%), and a red segment representing 2 (11%).</p>

Norway	16	9	4	29	0,05	
Portugal	11	8	5	24	0,05	
Spain	30	17	3	50	0,09	
Sweden	17	3	5	25	0,05	
Switzerland	21	12	5	38	0,07	
UK	7	6	8	21	0,04	
Other	0	1	0	1	0,00	
TOTALS	289	140	103	532	1	

**Table 5.1:** Surveyed Western European companies in the Food & Drink industry by company size and relative percentages in alphabetic order, as derived from our Research Survey results. **Source:** Lacroix et al © 2014

### 5.3. Corporate Environment and Decision Making Process



**Figure 5.2:** Customer Focused SVP Decision making Process in the Western European Food & Drink industry by company size, as derived from our research results. **Source:** Lacroix et al © 2014

SVP Decision Making by	Company Size		
Management Function	Large (250+)	Medium (50-249)	Family owned & Small (10-49)
General Manager, Owner, CEO of (268)	0	0	268
TQM, SCM, Logistics, Procurement of (163)	83	80	0
Sales & Marketing of (48)	18	30	0
Finance of (23)	2	21	0
Other (Accounting, Legal, Administrative, etc.) of (30)	0	9	21
<b>Total of (532)</b>	<b>103</b>	<b>140</b>	<b>289</b>

**Table 5.3:** Customer Focused SVP Decision making by Management Function in the Western European Food & Drink industry by company size, as derived from our Research Survey results. **Source:** Lacroix et al © 2014

#### **5.4. Skype/Conference Call – Follow-Up Process Findings**

Follow-up process was conducted between November 2013 and January 2014, Mr. Laurent LEMANT in France conducted 124 of the interviews while Richard LACROIX conducted 65.

Results from Follow-up skype and conference-call interviews on a representative sample of 200 of the 532 final survey responses, (8 companies did not accept the follow-up invitation, 3 cancelled even after rescheduling, and 189 were available and answered our skype/phone questions and provided us with feedback, trend information and suggestions about the future of their industry.).

One week before the communication the specific times/time zones of the conference call were agreed and confirmed and the list of questions were shared with a link set to participants email or through SMS to their mobile phone.

On the day of the interview we shared the link where the responses of the follow-up skype/phone conference call are published.

The follow-up interview process was conducted with the survey responder or when not available with a representative of the company authorized to respond in the place of the original responder. In 55% of the cases the original respondent was available. In 45% of the cases someone else or a group of people participated in the place of the original respondent. Only two of the 186 skype/conference calls had to be rescheduled which must be a record in the industry (one was rescheduled two times, and one three times, all others occurred as agreed). In all fairness the one that was rescheduled three times was due to persistent technical difficulties with the internet connection and skype on the receiving end of an Austrian company which were resolved on the third call.

Percentages of participating number of people on each skype/phone conference call, were as follows:

70% of (132) responses involved two people,

16% (29) one person,

11% (21) three people,

3% (7) four or more (maximum was 6 participants on one call).

Each skype/Conference Call were originally scheduled to last between 20-35 minutes but in practice lasted between 30-45 minutes, 7 of the 186 calls lasted 60-75 minutes.

Over 80% of the calls were conducted afternoons from 2-5PM local time, the remainder 20% of calls were conducted after 6PM (in some cases up to 7:30PM local time – 7 of the calls were conducted over the weekend to accommodate busy general managers schedules. ) 3 minutes were used at the beginning of the call for introductions (break the ice, ask about weather...) and 2 minutes were used to confirm agreed schedule/ the process of questions

**Q1) 5 minutes were used to summarize the Tri-state concept of IS (Current Situation), MUST (Best Practice in their field) and SHOULD (Perfection).**

We obtained an overall consensus of 97% and an acceptable 3% minor difference of viewpoints (Pareto acceptable rate) as to what is the SHOULD.

The conclusion:

**IS = the Minimum Requirements that Companies deliver as value to their customers** with their products or services. This includes/ can be impacted positively or negatively by the customer perception of the environmental track record of the company supplying to the consumer and fair trade and other reputation.

**The MUST = the best of Class or Best Practices in their specific area of the Food and drink industry** (and we identified that there are some differences if you deal with the COLD supply chain or Dry products as to the processes employed here). This tends to be influenced by publicity, social networks and NGO comments and campaigns.

**The SHOULD = Perfection**, where almost all agree that this is heavily influenced by R&D investments and involves INNOVATION as the main component. This can Bond the long term relationship of the consumer with specific brands based on POP and other labeling, here is the future Growth is expected to be found and will drive cost down for the customer.

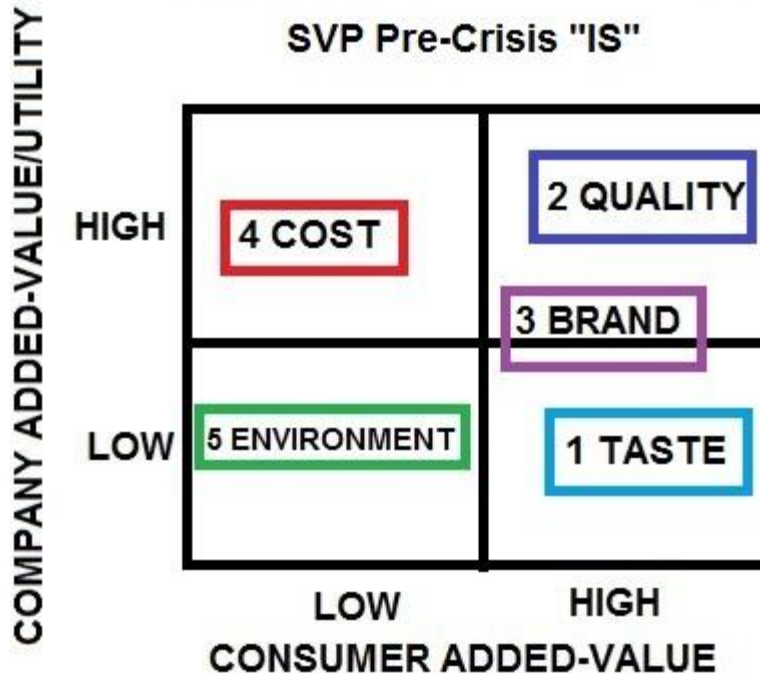
**Q2) 5 minutes for the second question on classifying - Taste, Quality, Cost, Environment, Brand.**

Based on prior feedback, we asked participants to rate (not from the company's point of view, but from their customers' point of view) in order of importance using a Lickert scale of 5 from most important 1 to least important 5 the following words: Taste, Quality, Cost, Environment, and Brand.

Here these 5 words (Taste, Quality, Cost, Environment, and Brand) were in turn placed on a 4 quadrants matrix with two Axis (Bottom up Y Axis = Company's High/Low importance in terms of Added Value/Utility and Left Right X Axis = their Customers Point of View Added-Value).

Participants for all 3 scenarios (Pre-Crisis / Crisis (today) / Post-Crisis) rated these and made forecasts for the future Post crisis period.

### Scenario 1: SVP Pre-crisis cumulative Results



**Diagram 5.1:** SVP pre-crisis diagram: the situation as it was in recent years prior to the Economic Crisis for companies that fulfilled the customer's minimum requirements. Source: Richard Lacroix et al © 2014.

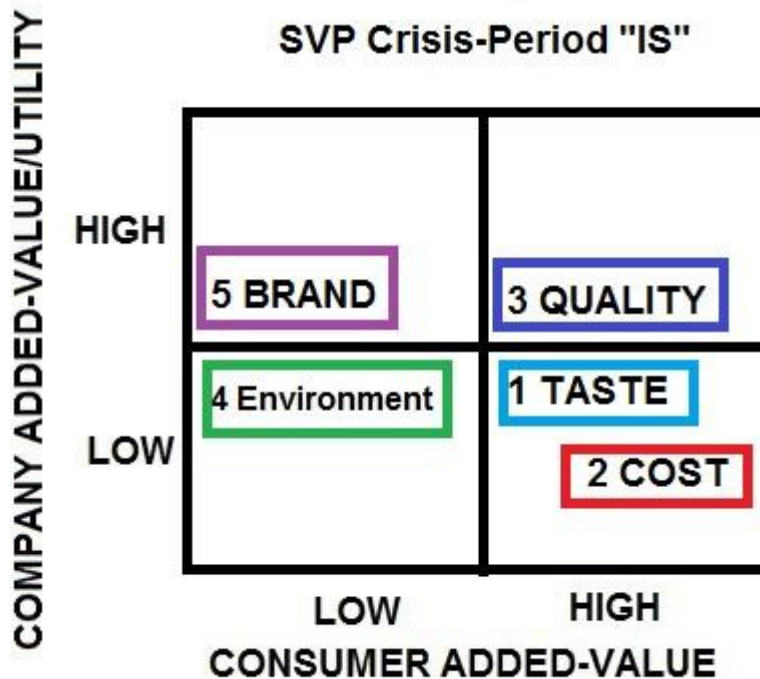
In Diagram 5.1, Taste is the first Added-Value priority requirement from the customer's perspective. Yet, although Taste is a high requirement for the customer, it rates Low from the company's perspective. Quality is the second Value-Added customer requirement and also ranks high from the company's perspective. Brand is somewhat important and is the third value-Added requirement from the customer's perspective while it is considered very important from the company's perspective. While cost is traditionally passed-on to the customer, because of the affluence it is not a high factor for the customer but it is important from the company's perspective.

Finally the environment for most customers and companies alike was not a high priority. Certainly some people wanted environmental friendly foods and



drinks but the majority of customers had not yet been “educated” to consider this a high priority.

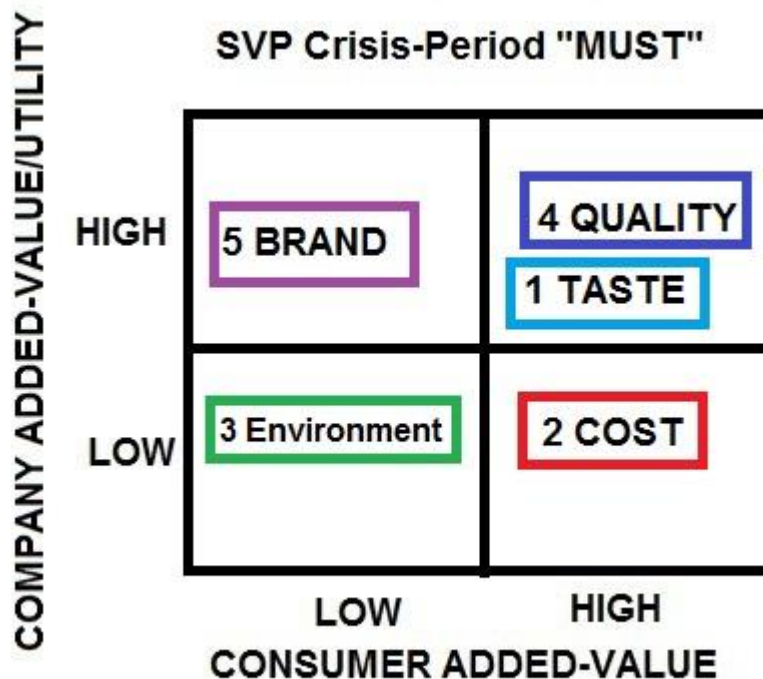
### Scenario 2: SVP Crisis (Today) cumulative Results



**Diagram 5.2:** SVP Crisis-Period (TODAY) “IS” diagram: the situation encountered by customers since the economic crisis began for companies meeting the customer’s minimum requirements. Source: Richard Lacroix et al © 2014.

In Diagram 5.2, Taste is the first Added-Value Criterion from the customer’s perspective, but not considered as important from the company’s point of view. Cost is very important and the second most important Added-Value Criterion to the customer but not perceived as such from the company’s perspective. Quality is the third Added-Value requirement for the customer and is equally very important to the company. The Environment is the fourth Added-Value area of lesser importance to the customer and the company alike mainly due to the budget constraints of customers having to make choices with limited budgets. Finally, while Brand is very important to companies it is of lesser

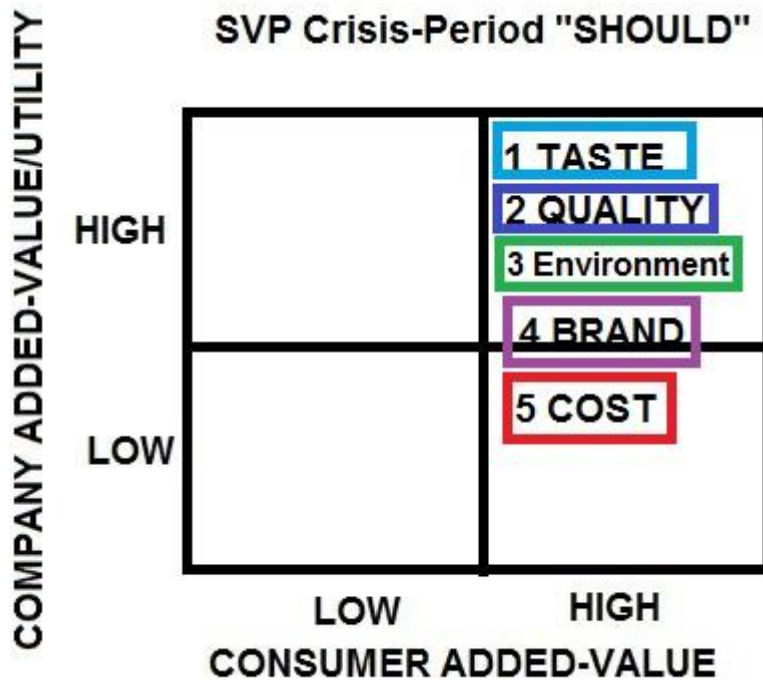
importance in terms of customer loyalty to the customer and thus comes last in the customer's priorities.



**Diagram 5.3:** SVP Crisis-Period (TODAY) "MUST" diagram: the Best Practices situation as observed since the economic crisis began for companies that exceeded the customer's minimum requirements. Source: Richard Lacroix et al © 2014.

In Diagram 5.3, Taste is considered the first Added-Value priority requirement for the Customer and has also become very important as expressed by best practices companies. Cost is the second Added-Value requirement and is very important to the customer but yet is not viewed as such by the company's perspective. The Environment is the third Added-Value requirement to the customer yet unfortunately the company considers it less of a priority as it is less profitable in comparison to less environmental friendlier choices. Quality is the fourth Added-Value requirement for the customer and remains equally very important to the company. Finally, while Brand is very important to

companies it is not worth paying a premium for and viewed as of lesser importance in terms of customer loyalty to the customer and thus comes last in their priorities.

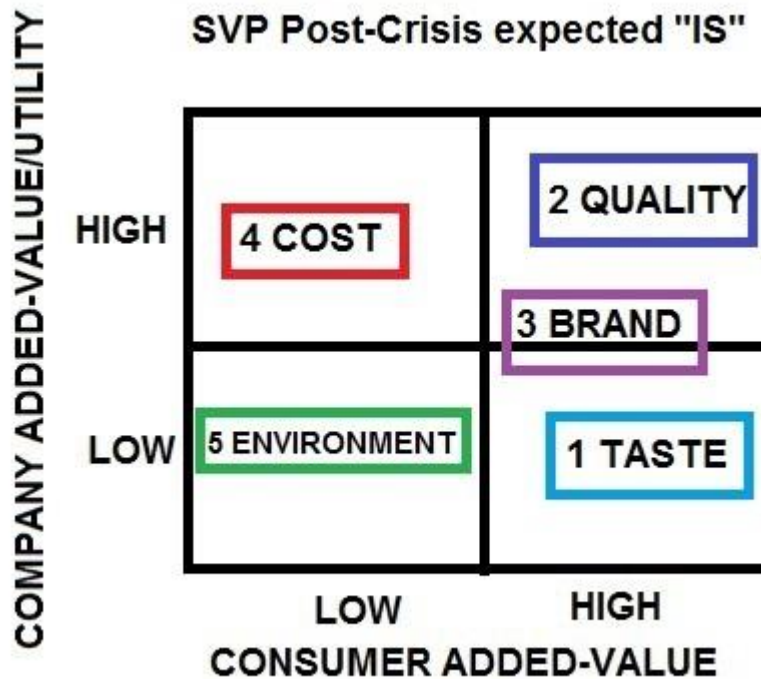


**Diagram 5.4:** SVP Crisis-Period (TODAY) "SHOULD" diagram: the Excellence Ideal situation since the crisis began, where Innovation surpasses best practices. Source: Richard Lacroix et al © 2014.

In Diagram 5.4, Taste, Quality, The Environment and Brand are All Very important Added-Value Criteria for the Customer and the Company Alike. This Unique / Ideal situation occurs when the company leads in sustainable procurement best Practices and continually seeks to exceed the customer's expectations through Innovation.

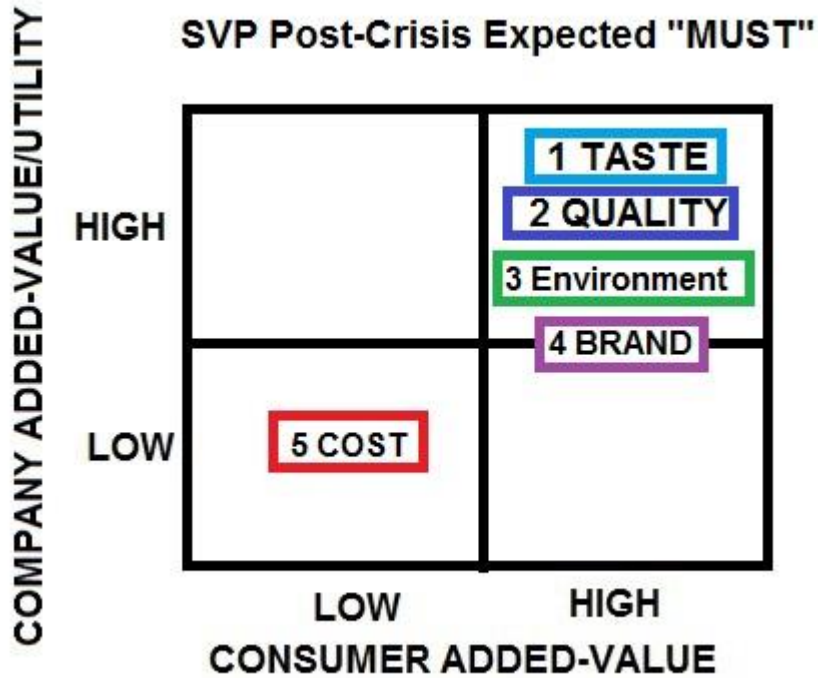
Cost is the last Added-Value Criterion for the customer because the company has managed to bring down cost and pass some of the savings back to the customers, but the cost criterion can still be brought down so as to become less important to the customer.

**Scenario 3: SVP Post-Crisis (Future Projected) cumulative Results**



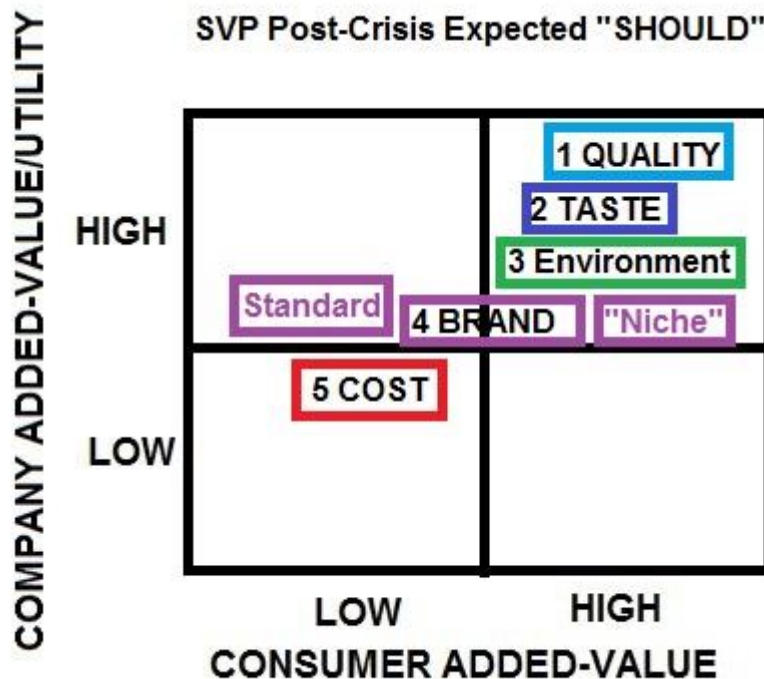
**Diagram 5.5:** SVP Post-Crisis expected “IS” – Projection of the “IS” conditions at the beginning of the recovery right after the Crisis. Source: Richard Lacroix et al © 2014.

Diagram 5.5, looks exactly the same as Diagram 1, this is no accident, in fact it is what participants described will occur after the recovery. The reason could be that the Added-Value Criteria of the customer could follow ups and downs like the  $F(x) = \sin(x)$  function over time.



**Diagram 5.6:** SVP Post-Crisis expected “MUST” – Projection of the “MUST” conditions at the beginning of the recovery right after the Crisis. Source: Richard Lacroix et al © 2014.

Diagram 5.6, looks exactly almost the same as Diagram 4 (for Criteria 1, through 4 Taste, Quality, Environment, Brand), but with one major difference, namely that criteria 5 Cost is now located in the Low/Low Quadrant. Participants expect that the quality in processes and changes to occur in supplier management will bring the cost of doing business down as many intermediaries will be eliminated thus making cost less important to customers and companies alike.



**Diagram 5.7:** SVP Post-Crisis expected “SHOULD” – Projection of the “SHOULD” conditions at the beginning of the recovery right after the Crisis. Source: Richard Lacroix et al © 2014.

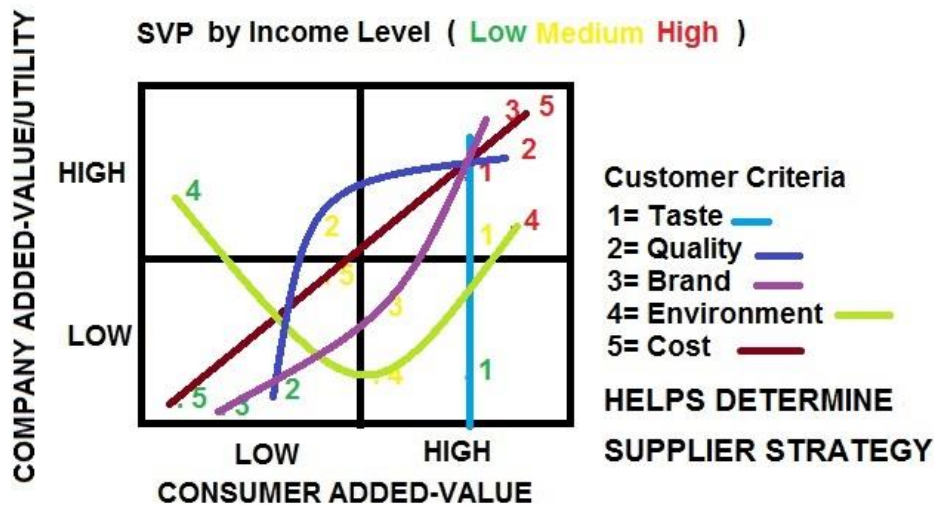
Diagram 5.7, looks exactly almost the same as Diagram 5.6 (for Criteria 1, through 3 and 5) Taste, Quality, Environment, Cost), but with one major difference, namely that criterion 4 Brand is across the low, medium, High Spectrum and is now equally spread across the two higher Quadrants (Low/High and High/High) as companies improve their offerings to capture all income levels.

**Conclusions:** The SVP Added-Value for the Consumer data captured by the Survey and the Follow-up Skype/Conference call suggests that companies that wish to maximize their “UTILITY” can increase their returns by:

1. associating the **Taste Criterion to the Quality Criterion** (for instance: our products taste good because our procurement supplies us with the best quality ingredients, or because our production processes are high quality which translates into safer and healthier products ...)
2. Eliminating Intermediaries in order to **drive cost down for the customer** (customer’s especially high income level like to know the producer farm information on the packaging labelling, and certifications in the supply chain)
3. Economies of Scale through innovation – is the major sustainable added-value criterion to bring cost down to the consumer while building greater confidence in the long term relationship being established between customer and company around the shared-values paradigm.

**Q3) 5 minutes for the third question on Identifying differences in the - Taste, Quality, Cost, Environment, Brand, based on the (High, Medium, Low affluence) income level of the targeted customer.**

We asked participants to position these same 5 words Added-Value (Taste, Quality, Cost, Environment, Brand) in the same 4 quadrants matrix used in the previous question so as to see how the curves remain the same or differ for customers based on their affluence income level profiles as represented in Diagram 5.8 below.



Source: Richard Lacroix et al (c) 2014

**Diagram 5.8: Customer & Company Value added SVP by Income level.**  
**Source: Richard LACROIX et al © 2014.**

The resulting graph is very interesting as it helps determine/suggest Supplier Strategy (e.g. ingredients requirements and constraints) by targeted customer income level. For instance for High income level, as we were told by some of the examples we received which indicate how the Brand (Image, Label, Packaging, Goodwill and Reputation) is addressed differently for expensive Wine as opposed to various Beers that address different income segments.

**Q4) 5 - 10 minutes to listen to participants suggestions, asking them a simple number – regarding if they have no, one, two , 3 or more quality certifications as seen in section 5.6 below – (HAACP is mandatory in Europe since January 2006, - additional standards are mostly voluntary – like ISO9000, IFS, ISO22000, etc. certifications) and thank participants for their time and contribution to this research and close the call.**

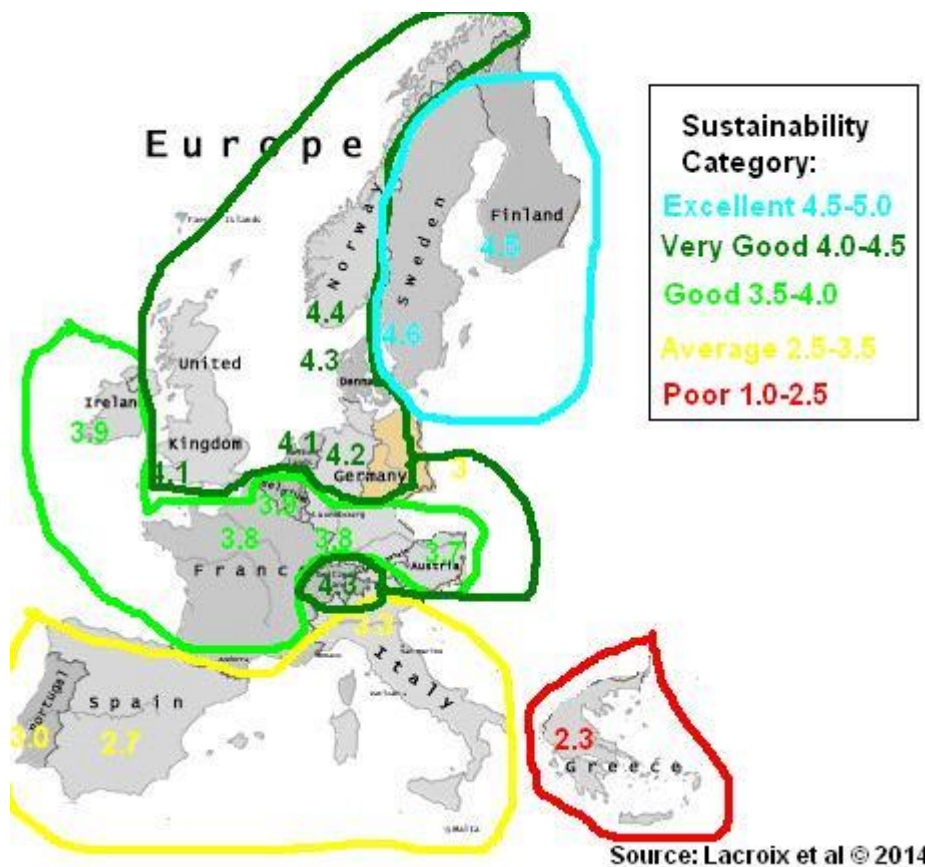


### 5.5. Companies Interviewed Sustainability Self-Evaluation by Country

Country	Lickert 1-5 Sustainability Grade	Sustainability Category
		Poor 1.0-2.5, Average 2.5-3.5, Good 3.5-4.0 Very Good 4.0-4.5, Excellent 4.5-5.0
Austria	3.7	Good
Belgium	3.9	Good
Denmark	4.3	Very Good
Finland	4.5	Very Good/ Excellent
France	3.8	Good
Germany	4.2	Very Good
Greece	2.3	Poor
Ireland	3.9	Good
Italy	3.3	Average
Luxembourg	3.8	Good
Netherlands	4.1	Very Good
Norway	4.4	Very Good
Portugal	3.0	Average

Spain	2.7	Average
Sweden	4.6	Excellent
Switzerland	4.3	Very Good
UK	4.1	Very Good
Other	3	Average

**Table 5.4:** Lickert 5 Level Indicator of Sustainability of Western European Companies self-evaluation ranking as derived from our Research from the surveyed Food & Beverage industry. **Source:** Lacroix et al © 2014



**Map 5.1:** Lickert 5 Level Indicator Map of Sustainability of Western European Countries as derived from our surveyed Food & Beverage industry companies.

## 5.6. Quality Management Certifications

Number of Certifications used	Large Company Certifications	Medium Company Certifications	Small or Family Owned Company Certifications	Total Companies Interviewed for Certifications
No Certification	0	4	13	17
1 = HACCP only	19	24	48	91
2= HACCP + ISO9000	34	15	9	58
3+= HACCP + IFS/ ISO22000 + (ISO9000)	14	6	3	23
Total Certifications	67	49	73	189

**Table 5.5:** Number of Certifications Reported by companies interviewed by Company Size. **Source:** Lacroix et al © 2014

The Companies we interviewed told us how many quality standard certifications they have in as seen in Table 5.5 above. While European Legislation requires all companies since January 1<sup>st</sup> 2006, regardless of size, to Implement HACCP (before 2006, this directive was optional in Europe), we still find 17 companies that are non-compliant no large company, but 4 Medium and 13 small and family owned (9% of the interview sample).

91 Companies reported 1 certification (HACCP) (48% of our interview sample): 19 Large, 24 medium and 48 small and family owned. 58 Companies reported two certifications (HACCP + another Usually ISO9000) (30% of the interview sample) 34 Large, 15 Medium, 9 Small or Family owned. 23 Companies reported 3 or more certifications (HACCP + IFS or IS22000 or ISO9000 or ISO14001 or Others) (13% of our interview sample) 14 Large, 6 Medium and 3 Small or Family Owned.

It is interesting to note that in the very regulated Food and Beverage Industry, while it is common to have one or two certifications, it is rare to have 3 or more due to the high cost of the certification process (roughly 50,000 Euros per certification over a 4 year time-span). This fact explains why the certifications (apart from the mandatory HACCP directive) are practiced mostly by Large and to a lesser extent by Medium size companies. This however did not dissuade some very few small and family owned businesses (15% of our interviewed sample ) from seeking 3 or more certifications (3 of the 189 companies). This while seeming intriguing was explained to us by two of the three companies that are “Niche Market Leaders” to use their terminology and that this competition (including with larger sized firms) and search for innovation and reliance on exports outside of Europe has brought them to seek excellence and pay the price to stay ahead of the competition and perceived market threats.

## 5.7. Conclusion

The interview process in combination with the previous survey work was very exciting and enabled us to cross check some of the assumptions and initial conclusions we had formulated from the survey process, Moreover, it broadens our understanding into how these food and beverage firms operate as advocated by Harris and Brown (Harris L. & Brown G., 2010). Further we confirmed some assumptions and learned from them from their sharing of their vision for the future of European Food and Beverage Companies.

In section 5.2 we indicated the breakdown of companies surveyed by size and by country, the sheer number of these companies makes the sample at worst interesting and at best indicative of new trends regarding the sustainable procurement initiatives of these mostly innovative companies.

Section 5.3 confirmed what was empirically known about the decision making differences between Large, Medium and Small and Family owned businesses. This section also provided numbers enabling a comparison between large very hierarchical and flat org-chart structured companies. These numbers helping to explain some of the differences in flexibility especially in small and family owned businesses. We were able to confirm not only the obvious, that SMEs have less formal processes and limited resources in comparison to Large or Mid-size companies. But also that SMEs rely heavily on the good and occasional bad decisions of the general manager. The General manager we found is often the owner and sole decider for strategic procurement decisions while day to day tactical decisions of lesser strategic importance and lesser monetary value are delegated to secretarial or administrative staff not trained or knowledgeable in sustainable procurement.

Section 5.4 was probably the richest in content, besides showing us several “variations” of the prioritized customer value-added concepts of taste, quality, brand, and environment and cost – as perceived by companies, it provided a projection and valuable insight as to how these companies this evaluation could evolve over time.

Section 5.5 opened our eyes about how the interviewed companies rated

themselves on a Likert 5 scale. It is interesting to note on the resulting map of Europe by country, that Greece is at the bottom and Sweden and Finland at the top, which is somewhat different from the “official” Eurostat view that Switzerland is on top of Europe. We think that this can be explained by the very peculiarities of the food and beverage industry which is subject to offer and demand pressures yet remains mostly competitive because traditions in consumption and taste are elements that go beyond marketing projections and are tied to the subjective taste and likes of consumers.

Section 5.6 Besides quantifying somehow the number of certificates that companies of the sample have on average, while results were predictable for large companies, provide a “freshness” because the people interviewed felt comfortable with the format of the process and “opened-up” and admitted such a high percentage of non-compliance with HACCP mostly amongst small and family owned businesses (large companies are often audited and would not get away with it). We promise we will not report them and we thank them for their candor, we hope all future research interviewees will be as candid and frank in their responses.

## 6. Financial Aspects of Sustainability

### 6.1 Introduction

This chapter presents our main findings and innovations from the study which relate to financial aspects of sustainability. Literature references and key concepts (such as the value chain) from other authors can be found in Appendix H.

There is plenty of evidence in academic literature that sustainable investment increases financial performance. This was confirmed by most of the larger and some of the mid-sized companies from the food and beverage industry that we surveyed which are practicing sustainable procurement, as they attested to us that they did well on the European Stock markets where their shares are being traded. This is consistent with prior research findings: (Plincke E. & Knorz A. , 2006), we quote from studies of mostly German and Swiss (and some US) funds, “Recent research studies conclude that, on average, a good environmental and social performance does not compromise the financial performance of Socially Responsible Investment (SRI) Stock funds. This may be the result of a combination of a positive performance contribution of the individual investments (more sustainable companies tend to perform better financially ) and a slightly negative contribution of the portfolio diversification restriction (based on the Capital Asset Pricing Model (CAPM) due to the reduced number of companies fit for investment in SRI funds). However, the different statistical studies may still underestimate the positive long term effect of a good environmental and social performance on a company’s financial performance, as the number of companies and the length of the time intervals analyzed may still be too limited to account adequately for the ‘latent’ character of environmental and social risks. ... according to the results of the studies, the more actively managed funds tended to outperform the passively managed funds and SRI indices”. [*MIT Sloan Management Review International Study (2013)*] Which comprised 2600 companies from which roughly 24% were European companies had some interesting findings (According to an internet wire Feb 5 2013 issue):

“Nearly half of respondents said their companies had changed their business

model as a result of sustainability opportunities.

According to David Kiron, executive editor at MIT SMR and a coauthor of the report "Sustainability-Driven Innovators see the opportunity differently than do companies that haven't gleaned sustainability's financial rewards ... "They don't dwell on it as a cost issue. They focus on how their efforts can increase market share, boost energy efficiency, and build competitive advantage."

We learn that these Sustainability-Driven Innovators, also bring a strong execution focus to their efforts, as they place customers at the center and work closely with many stakeholders, in order to drive sustainability objectives through skillful organizational change. The study found that the extent to which a company incorporates sustainability concerns into its business model often correlates with its increase in profit. Some examples:

50 percent of survey respondents who had changed three or four business model elements said they profited from their sustainability activities, compared with only 37 percent of those who had changed only one element of their business model.

When innovations to both target segments and value-chain processes were among the three or four business-model changes, the percentage of respondents who said sustainability added profits climbed from 50 percent to nearly 60 percent.

More than 60 percent of respondents at companies that had changed their business model and had sustainability as a permanent fixture on their management agenda said they have added profit from sustainability.

Companies that profit from sustainability are almost 200 percent more likely to develop sustainability business cases. The business case is often integral to the company's overall strategy.

To quote the BCG partner and co-author Knut Haanæs "The research suggests that business-model innovation, top-management support,

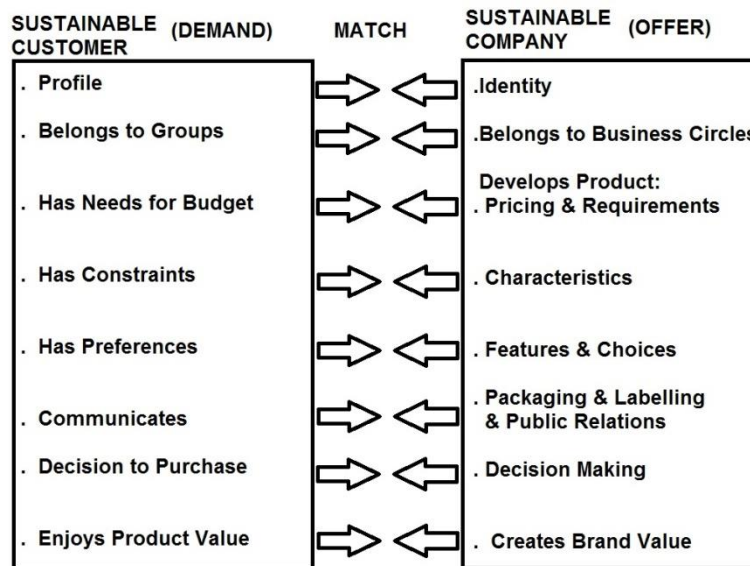


collaboration with customers, and having a business case are all critical to creating economic value from sustainability activities and decisions, ... Executives need to view sustainability as both a business necessity and an opportunity. Even moderate changes to company business models can reap significant financial rewards (Internet Wire February 5 2013 Issue "Study Shows Increased profitsfor companies that embrace sustainability").

In a section of the report called "Hitting the Sustainability Bull's-Eye," the report recommends amongst other things: Be prepared to change business models, Measure and track sustainability goals and performance, Understand how customers think about sustainability and what they are willing to pay for in connection with sustainable products or services, and Collaborate with individuals, customers, businesses, and groups beyond the boundaries of the organization. Thus confirming the importance of putting customers in the middle of companies' decision making relating to sustainability and sustainable procurement. With that background in mind this chapter will look at how value of sustainable procurement can be formulated and measured and recommended innovations in terms of its financial calculation.

## **6.2 Sustainability Offer and Customer Demand Matching**

While Journal literature is rich in content, we could not find a single reference diagram in journal literature attempting to match how the effects of a sustainability implementation from a company's perspective create a sustainable food and beverage product offer which matches somehow with the requirements of an environmentally and socially conscious customer having a restricted purchasing budget, consequently we created our own in Figure 6.1 below



(c) LACROIX et al 2015

**Figure 6.1: Customer Sustainability Purchasing Decision Making** (in the Food and beverage industry) based on value added compatibility match with company product and sustainability initiatives. **Source:** © Lacroix et al. 2015.

Figure 6.1 summarizes the correspondence between the company offer and the customer demand based on a series of matches on the one hand between customer profile, requirements and constraints and wishes and their social media interaction with the firm, and on the other hand the correspondence with the company identity (history, tradition, mission statement, culture & HR management style, reputation & innovation history), product pricing requirement characteristics, product features, packaging and labeling and actions of the Public Relations (PR) department of the company on these social forums and discussions with customers.

**From this demand experience, the customer fulfills his/her nutritional or thirst needs, gets to taste the product, gets satisfaction from the consuming act and retains a hopefully good experience contributing to the well-being of the individual.**

**From this offer experience, the company which with its offer fulfilled the customer demand for such product, besides from the obvious payment**

**transaction, can hope to gain from this sustainability practice through the strengthening of the brand and:**

**Margin Improvement (Scale)**, including human /intellectual capital, more efficient operations, cost savings, risk management, pricing strategy.

**Revenue Growth (Income)**, including Market share and Niche/New markets opportunities.

**Financing**, besides the price of shares on the stock market, greater access to credit to finance investments and sustainability initiatives.

### **6.3 Consumer Purchasing Decision Making Drivers.**

Educated and well informed consumers are becoming more difficult to control and influence given the many choices that are available for them on the market. In our study, we asked several of the surveyed and interviewed companies their opinion and cross checked companies understanding with the Hartman group. The results of this effort are presented below.

Western European companies indicated that the “Brand name” is the first thing their customers remember after using a product for a while. Their customers on the other hand tend to look at the price first regardless of the brand to fall within their budget. When customers see a new product, so long as the price is right, the main factors that will influence them are 1) packaging and labelling and 2) advertising and promotions. In our interactions with the Hartmann Group we were reminded that customers have constraints that can influence negatively their predisposition to purchase based on health or religious or psychological constraints which customers are consciously imposing on themselves.

Examples of constraints include Health/Diet restrictions based on the consumer’s health situation or allergies to specific ingredients, fat or sugar content, or product containing GMOs, or fasting for religious customers and preference for instance of Kocher or Hallal or vegetarian or non-meat/non-dairy based products. A time factor exists that affects seasonal purchases, for instance hot chocolate in the winter and iced-tea in the summer. The concept

of Quality from the company's perspective becomes quality for the consumer when there is a service or perceived value received from its use, for instance a health benefit.

While Large and Medium size companies have more R&D potential than small and family owner companies, several have shown they can be competitive in niche markets. One such example is a family business in France that sells small "bio" goat cheese snacks called "cabekous" in a very attractive wooden box on top of a wine leaf and decorated with a walnut. These product is in high demand and the company only fulfills an estimated 70% of the demand of that particular local niche market.

A positive influence is almost always achieved when mentioning ease of use, and convenience. Most customers do not regard the warranties (e.g. the ability to get a refund if the product is not to your liking) as something really influencing their purchasing decision. The best known secret in the food and beverage industry is in the packaging and labelling with health claims. Several new products are targeting children's healthy diet versus obesity and pregnant women. The growth of availability of Bio products can attest to this new market (but price is still the main factor for the decision). Various claims about "traditional" or "grand-mother's recipe" or "genuine" product of origin certainly give the customer a justification to pay extra and feel good about it. Taste is seen by customers as having free choice and not necessarily related to health benefits, usually brands that advertise a product with "great taste" or "new taste" use this wording to unbalance the sugar and fat contents of these products. Packaging and Labelling seems to have a lasting influence on consumers, meaning that even if a product is liked by consumers as is, the company needs to revise, renew the packaging and labeling every few years to keep the customers interested and excited about the brand; often generating a successful image of themselves which makes them feel good for their purchasing choice for instance of Max Havelaar Fair Trade Coffee. In line with our findings and worthy to be mentioned is the recent research report

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by Smithers Para on sustainable packaging (2014), which claims that Consumer demand, government legislation and technology advances will propel sustainable packaging to a \$244 billion market by 2018. The particular report details market sizes, projections and five-year sustainable packaging trends to 2018, by focusing on key drivers, trends and technologies shaping the sustainable packaging industry. It breaks down sales by type, end-use market and geographic region, and provides comprehensive coverage of the global market and supply chain. It asserts that sustainability programs are increasingly being seen as a source of innovation that can help in differentiating a company by appealing to the consciences of consumers, the report says. These programs also serve as a platform for new product and market development. The most common sustainable packaging trends identified include increased practices and use of:

1. Downsizing/light weighting of packaging
2. Recycling and waste recovery
3. Recycled content
4. Renewably sourced materials
5. Improvements in packaging and logistics efficiency

In the recycled material packaging segment, paper packaging is the largest market, followed by metal, glass and plastic. While the demand for recycled plastics remains strong, the material faces several challenges, including lack of infrastructure for collection and sorting, international market competition for existing recovered materials and compliance with requirements related to food and drug content. The demand for sustainable practices is driving the market for greener packaging, which is boosted by a growing affluent and health-conscious middle-class population.

The report concludes that the issue of sustainable packaging will continue to grow in importance over the next decade and is predicted to become the number one challenge facing companies, beating cost and other issues by 2023. Innovation in packaging has a wide reach, particular in the food and beverage industry. European beer maker Carlsberg recently teamed up with a group of global suppliers to develop the next generation of packaging products

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that are optimized for recycling and reuse, otherwise known as “upcycling.” The companies will use the Cradle to Cradle Design Framework®, created by Professor Michael Braungart and EPEA Internationale Umweltforschung GmbH, to develop a Cradle-to-Cradle® roadmap and assessment of their products. Also last year, UK paper manufacturer James Cropper announced it has developed an innovative recycling process that incorporates cocoa husk waste from chocolate production into unbleached cellulose fiber to produce a food-grade paper. The company says turning the otherwise wasted skins of many of the 3.5 million metric tons of cocoa beans produced each year into paper could be a significant breakthrough for the food and packaging industries.

#### **6.4 Conclusion**

In section 6.1 we presented literature justifications pointing to sustainability being profitable at least at the stock market level for companies, and that companies implementing sustainability tend to get easier access to capital.

In section 6.2 We presented our proposed model matching company offer and customer demand.

In Section 6.3 we presented some notes as to the priorities of consumers and the company and on the growing importance in the food and beverage industry of Packaging and Labelling innovations for the coming years.

Our conclusion for this chapter is that while the concepts of Profitability and Effectiveness and Efficiency and Innovation are essential elements of a sustainable company culture, Satisfaction both for the consumer and company employees has to do primarily with the quality of life they envision from their respective perspectives. Hence The Sustainable Company culture takes all of the above elements into consideration. **Value for the customer** is still a complex science, because it is based often on intangible elements such as taste. In our attempt to explain this concept let us suggest that it can be

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simplified as being the sum of three factors:

*Value to the Customer = The quality of life ideal of the customer + the needs requirements within budget +/- Constraints + Product Features & Choices – Time Factor.* (R. Lacroix et al. 2015 ©)

Naturally while we try to make the customer demand be matched with the company offer, we must not forget that the goals of both sides may not always match perfectly. From the company's perspective, it wants increased market share, added value, profits, brand recognition and good reputation and customer loyalty. From the customer perspective, he/she wants a low purchase price, a great taste, high quality convenient and easy to use products that use intelligent packaging and labeling. A company offering a solution he/she can feel good about without social or environmental regrets and being a long term partner that listens to his/her demands for safer, healthier and more environmental and social products is the challenging and desired outcome.

Fashion has a lesser importance in the food and beverage industry as compared to other industries (with the exception of the luxury food and drink market segment) but of course further research is needed directly with consumers to validate these preliminary assessments of the companies we surveyed and interviewed as part of this study.

Related Information on this chapter can be found in the Appendix H:

In [Appendix H.2](#) We show how Michael Porter's Value chain can be adapted for sustainability and how customer demand purchasing decision corresponds to a match with the company's product offer and a list of Life Cycle Sustainability Indicators for the Food system from a study from Heller and Keoleian (2000).

In [Appendix H.3](#) we Present Accounting Aspects of Sustainability, starting with the DuPont ratios Pyramid which can be used to dissect a company's financial statements and to assess its financial condition by merging the income statement and the balance sheet into two summary measures of profitability, namely the Return on Assets (ROA) and Return on Equity (ROE). The

conceptual model of financial analysis on sustainability from Chousa J.P and Castro N. R, (2006) can be found there. This model indicates the relationships between the corporate objectives, Valuation Components,

Value drivers and Management decisions down to Environmental Value Drivers. The Financial Model of Sustainability according to Chousa J.P and Castro N. R, (2006), can also be found there. The derived ratios from DuPont down to ROA and ROE can be observed in terms of accounting ratios together with an explanation of some indicative ratios.



## **7. Discussion, Conclusions & Limitations**

### **7.1 Discussion**

Summarizing what we discussed in the previous sections, on the adoption of the practice of sustainable procurement by companies operating in Western Europe, we found based on descriptive statistics, that this knowledge is widely applied across the range of operational activities and used more or less by the vast majority of the surveyed companies, with a tendency for further applications in the future. Indeed, the results of the implementation of sustainable procurement face great success, offering significant benefits to businesses. As expected, the majority of decisions on sustainable procurement-driven are cost-motivated, but for a significant number of these companies the implementation of these strategies are used to gain a competitive advantage and establish a long-term loyalty relationship with consumers. With regards to large companies being leaders in the field of sustainable procurement we did not find something revolutionary or going against any existing published research. We can only confirm existing trends regards to them having easier access to investment capital and hence to have a richer budget for Research and Development (R&D) than small and medium size companies. With regards to SMEs we have some new and exciting findings as will be described in the proposed model below. For SMEs, we present the main innovation from our empirical survey from these subsample (of the 532) 429 Western European, Food and Beverage SMEs surveyed in 2012 and 2013 for Sustainable Procurement. We also address possible uses and applications of that Model for SMEs located in Europe and other regions.

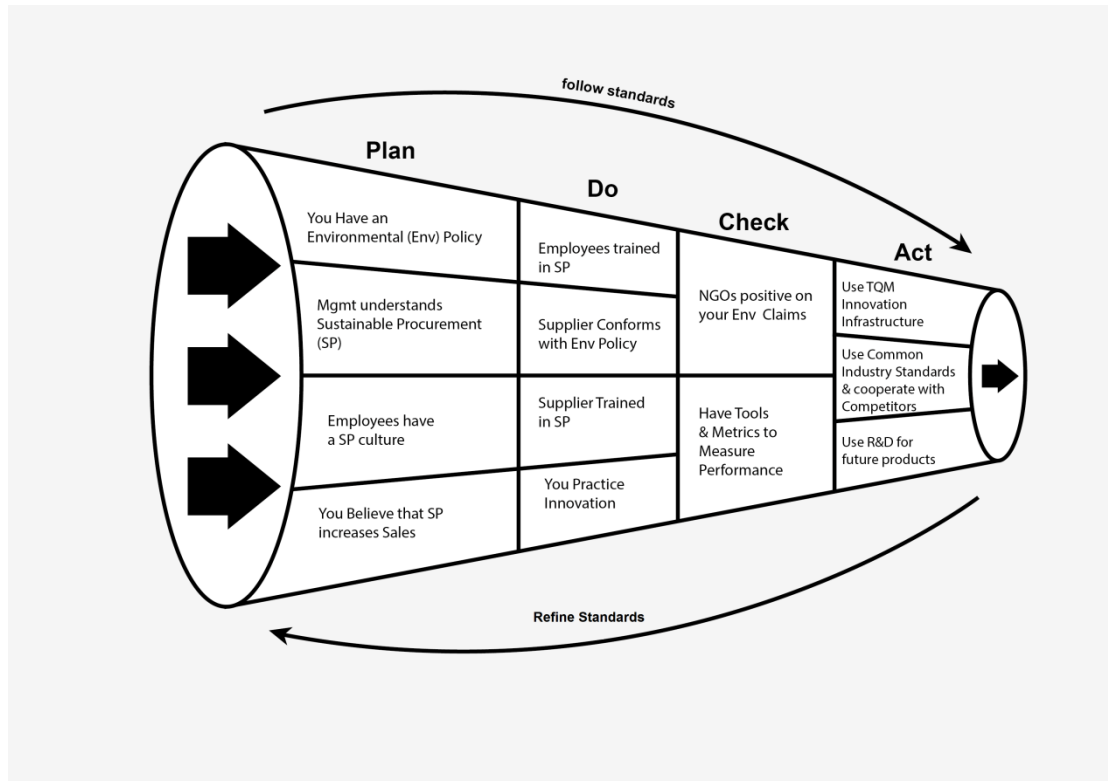
#### **SMEs Model Description**

Trying to summarize and create a model based on our variables searched, we decided to select only the SMEs sample (companies with less than 250 employees). Revising the questions of the questionnaire we selected only those which deal with sustainable procurement, reducing our variables to 18. Evaluating our new dimension, we performed a Cronbach-A test of reliability, using the option of test called "if item is deleted". This option gave us the knowledge on how could we construct a scale with optimum Cronbach-A, by

deleting in each test repetition, the variable which discovered by the program to lower the result of the test. Thus, we ended up with 13 variables of the initial team that gave us the optimum Alpha of 0.814, (initial 0.697).

The 18 of 33 original questions of our survey were reduced to the table of 13 final variables which constitute our Model as seen in Appendix A. The procedure for arriving at this classification encompassed the following steps:

- 1) Converting the 13 Lickert-5 responses data into dichotomous "bivariate" y/n answers (1-2 answers converted to "No" and 3-5 answers converted to "yes") in order to simplify the trend of answers.
- 2) Observing in the resulting data set that variable v1 ("Have environmental policy") has the most "yes" answers of all variables (420 of 429 SMEs).
- 3) Checking inside this 420 data set to find for the next variable with the most "yes" answers, variable v2 ("SME understands sustainable procurement") with 409 answers.
- 4) Recursively repeating the procedure as seen in steps 2 and three above for the remaining 11 of the 13 variables we obtain the final ordered list as presented in the table of Appendix A.
- 5) Please note that while analyzing the ordered list of 13 variables of that Scalogram from step 4 above, our team noticed that these appear to match the Deming "Plan, Do, Check, Act" (PDCA) Model (also known as the Shewart Cycle).
- 6) Wanting to organize these variables into four (4) factors without altering the order, we arranged them into these final four phases as seen in Appendix A. The Guttman Scalogram Model we obtain is consistent with that methodology (see [footnote 1](#) in chapter 4.8) as shown in Figure 7.1.1.



**Figure 7.1.1:** SMEs Sustainable Procurement Guttman Scalogram Model

The Model shown in Figure 7.1.1 is shaped like a funnel, with a large entrance to the left and a narrow exit to the right because many SMEs enter the process to implement sustainable procurement on the left and fewer in number have reached the highest levels of excellence. As SMEs travel through that funnel they start on the left towards the other end of the funnel on the right, where they evolve through four phases of maturity labeled Plan, Do, Check, Act and corresponding to the four phases of the well known Deming Cycle. For the more advanced of these SMEs, the PDCA process is repeated several times (continuous improvement) to reach the highest levels of excellence desired by the SMEs management. The top elliptic arrow is going from left to right over the funnel labeled «follow standards" applies to SMEs, that are new to sustainable procurement and which follow the proven path of leading SMEs having developed these best practices. The other elliptic arrow going from right to left at the bottom of the funnel is for the best of SMEs that have already reached excellence and who refine the standards for other SMEs to follow. By answering cumulatively yes to each question in each phase, an SME

completes that phase and progresses right onto the next phase, and so forth until completing all four phases. Consistent with the Guttman Scalogram methodology, an SME, passing through some phase in the funnel has already cumulated yes answers on all previous steps encountered earlier in the funnel. Stated differently, an SME exiting the funnel on the right has answered yes in all four PDCA phases of the Deming cycle. An SME located in the A phase has already answered yes to all previous questions of the PDC phases. An SME in the C phase has answered yes to all questions in the PD phases. An SME in the D phase has answered yes to all questions in the P phase. Let us be clear that not all SMEs complete any given phase of maturity through that funnel. SMEs that remain stagnant at any given phase have failed to take appropriate steps enabling them to advance through that funnel.

Without a plan and management support (commitment and endorsement) of strategic decisions, nothing gets achieved in an SME. Thus, the first Stage of Maturity is **Deming's Plan Phase**, comprised of four questions answered in order from top to bottom:

P1 = Do you have an Environmental Policy?

P2 = Does your Management Understand Sustainable Procurement?

P3 = Do you have a Sustainable Procurement Culture for your Employees?

P4 = Do you Believe that Sustainable Procurement Increases Sales?

While Planning is essential, it is insufficient without the necessary follow-up of management to ensure their orders were carried through (implemented) by employees and business partners of the SME, and in the proper manner for the plan to have a chance to succeed.

## 7. Discussion, Conclusions & Limitations

Thus, the second stage of maturity is **Deming's Do Phase**, comprised of four questions answered in order from top to bottom:

D1 = Have you trained your Employees in Sustainable Procurement?

D2 = Are your suppliers conforming to your Environmental policy?

D3 = Have your Suppliers been trained in Sustainable Procurement?

D4 = Are you more innovative in SP than others in your industry?

Good managers are anticipative. Hence, they do not leave many things to chance. SME management may want to get the timely feedback when something went wrong and make informed decisions to resolve problems short term and to prevent them from reoccurring long term. It is not good enough to have internal feedback when something leaks to the press; external feedback by neutral sources like Nongovernment Organizations (NGOs) are of great value to see short term how customers and the general public perceive the SME. Having tools and metrics in SP is a reliable source of information to measure progress and make informed decisions. The lack of tools and metrics is considered the major weakness of most SMEs.

Thus, the third stage of maturity is **Deming's Check Phase**, comprised of two questions answered in order from top to bottom:

C1 = Would NGOs rate you positively on your environment policy claims?

C2 = Do you have tools and metrics to measure SP performance?

Because employees tend to repeat mistakes, management may resolve to endorse and facilitate the creation of a continuous improvement culture in the SME. Employees are required to Act and make all necessary changes to existing processes and corrections to the existing operational plan if the SME is to reach the peaks of excellence. While implementing standards represents a significant cost to any SME it does guarantee that specific best practices steps are carried on, thus making the quality of the outcome more predictable as opposed to not adopting standards. Further, R&D does represent a cost for SMEs but also promises innovation and permits to rethink from time to time and to refocus the SME on more profitable markets.

Thus, the fourth- and final stage of maturity is **Deming's Act Phase**, comprised of three questions answered in order from top to bottom:

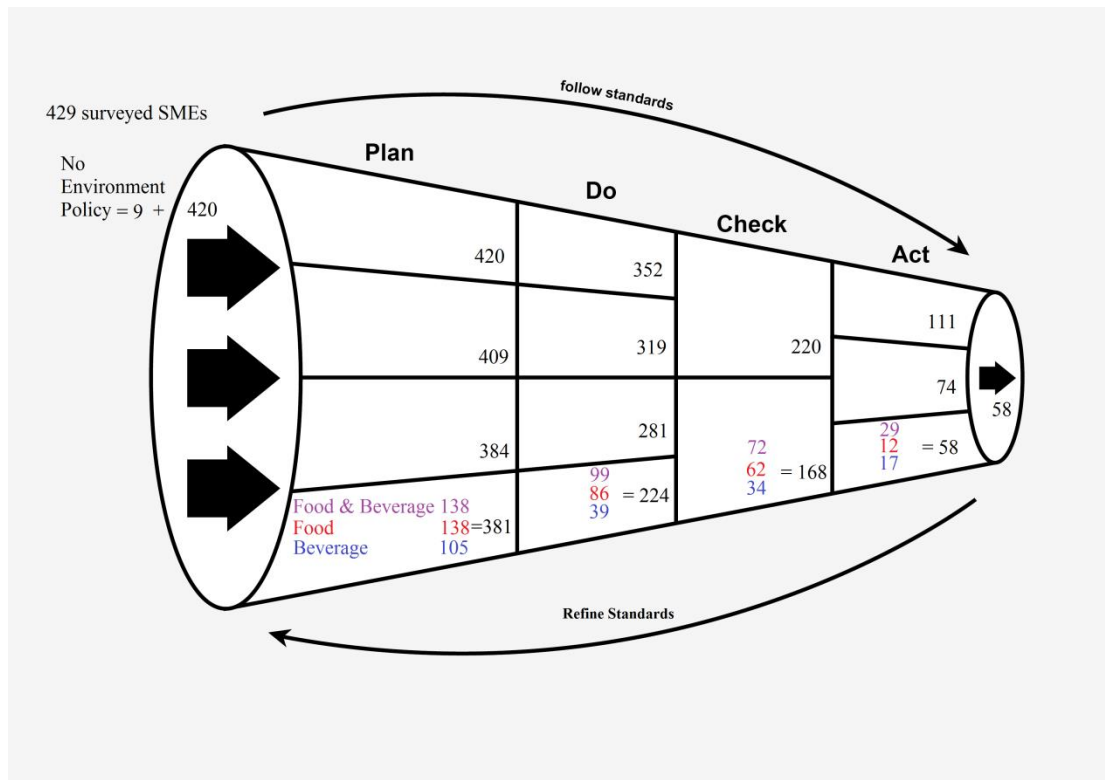
A1 = Do you use a TQM innovation infrastructure for SP improvement?

A2 = Do you use common industry standards and occasionally cooperate with competitors for SP?

A3 = Do you use R&D to improve future products?

#### Preliminary Answers to Consider the Validity of the Model

Some words of warning before reading the observed data. While we do not claim to have exhausted all possible criteria to describe sustainable procurement implementations in SMEs, we do not exclude the possibility that future studies may choose to focus on other aspects of this new research area. While this model is not the final word in this area of academia we consider it accurate until our colleagues identify a better solution. The accolades for this pioneering attempt belong to these 429 Western European Food and Beverage SMEs, which in the 2012-2013 timeframe, kindly and without pre-conceived barriers, offered us their candid understanding of what they practice, as shown in Figure 7.1.2 below.



**Figure 7.1.2:** Survey Results in SP Guttman Scalogram Model for SMEs.

As you can observe in Figure 7.1.2, of the 420 SMEs that enter the SP process, 381 completed the Plan phase, 224 the Do phase, 168 the Check phase and 59 the Act phase. We provided the breakdown in each phase to illustrate how many of these belonged to the food and beverage, or food or beverage industries. See Appendix B for the breakdown of SMEs by country.

#### Possible Uses of the Model

The most-likely uses that we identified for the model are the following:

- 1) Be used in the market by Food and Beverage SMEs to Self-evaluate, and identify their current Sustainable Procurement maturity level on that scale. A company that wants to progress must first understand where it is and perform a gap analysis with regards to its objectives so as to devise the correct plan of action. This model is also useful to SMEs that are new to sustainable procurement in developing the plan of the activities and infrastructure they require in order to benefit from sustainable procurement.
- 2) Be used by SME to Compare their maturity level with best in class higher rated on the scale leaders from Switzerland and Northern Europe and

optionally use the information as a differentiator in their competitive advantage strategy for Niche and other Markets, or to gather capital from investors.

3) Enable SME management to improve their operational performance by gradually encompassing the not currently implemented processes and measurements of that model (particularly the D and A phases) and taking corrective action in accordance with Deming's principles of continuous improvement.

4) Be used for training purposes: while several SMEs lead the pack in sustainable procurement, there are still many which do not know how to capitalize on Sustainable Procurement innovation efforts and others who don't know how to integrate Sustainable Procurement into their business operations.

5) While the Model exists for use by SMEs in the Food and Beverage industry, we see no reason this Model could not apply to other Geographic locations or be adapted to check sustainable procurement maturity of SMEs in other industries. The empirical study results suggest a need for SMEs entrepreneurs and their firms to upgrade their training and to increase their reliability on tools and metrics in order to enhance their innovation and Sustainable Procurement capabilities.



## 7.2 Conclusion

As seen in chapter 3 of our initial Hypotheses were confirmed:

H1: The companies-leaders in the field of sustainable procurement invest in specialized training of their staff on issues of sustainable development.

H2: The companies-leaders in the field of sustainable procurement are leaders in the field of TQM.

H3: The companies who are leaders in the field of sustainable procurement are those characterized by innovations.

And one was not:

H4: The investment in sustainable packaging and labeling offers no added value to consumers

Hence investment in sustainable packaging and labeling offers added value to consumers.

As far as SMEs are concerned, our research had this to say:

**How Mature are Western European SMEs in sustainable procurement implementations?** While the majority of SMEs especially the smaller ones are known to not be Mature, amongst those which have an Environmental Policy (estimate 10% of the General population of SMEs) that we chose to sample, 13% of these are very mature (58 of the 429 sampled SMEs in our model). While the percentage is estimated closer to 5% in the general population of SMEs, 13% is still low in the specialized segment. We expect this percentage to increase significantly (almost double) over the next 10 years as there is a growing number of SME owners who believe in the importance of preserving the environment, and for that reason alone, decide to implement sustainable procurement because it conforms to their beliefs. The majority however of SME owners use Sustainable Procurement as a means to conform to the International and European Legal frameworks independently of the strength of the owner's beliefs (Zhu Q. & Sarkis J. 2007). . The most frequent reasons for their investing in sustainable procurement are: 1) to achieve profits, 2) to improve their reputation with customers (as a Branding and Ethics

differentiator compared to the competition), 3) for R&D purposes in order to develop niche products for exports markets. The proposed model matching the Deming wheel is surely interesting and deserves further research exploration. Practically, SMEs wanting to evaluate their SP maturity with this model will also be able to compare how they fare with other SMEs. Preliminary indicators are encouraging, but it is too early to draw conclusions on the model as we have no evidence of its use except for a few companies that expressed their intent to experiment with this model. We believe the subject of sustainable procurement (and our focus on SMEs) is current and worthy of further academic research as indicated by a recent special issue by the *Journal of Purchasing and Supply Management*, Volume 19, Issue 4, Pages 215-276 (December 2013), and of interest to practitioners.

### **7.3 Limitations and Recommendations for Future Research**

There are several limitations to our empirical study and to our resulting model presented here; we sincerely tried to balance good research practices with the goals and pressures to complete a reproducible survey according to the highest academic standards.

First in learning the prerequisites in the development of the survey: Because we intentionally wanted to survey companies, which are pioneers in sustainable procurement and had ready access to decision makers, we contacted them to obtain a picture of the challenges involved.

We followed up these early unstructured conversations with two round table sessions, one in Paris in September 2011 and the other in Zurich in November 2011, probing them on the state of SP advances in Europe. It is possible that other more theoretical approaches could yield a different perspective, hence different assumptions and thus a different outcome or applicability of their findings. Possibly, because there are cultural differences across Western Europe, although we made no use of that information had the preliminary meetings been in London, Rome or Stockholm the feedback could have been

## 7. Discussion, Conclusions & Limitations

different, but we feel the trends would remain similar at a Western European level.

Second in selecting the data source: We consciously used the European Chambers of commerce database of member companies as a starting contact data source (over 86% of companies are registered there). Next we cross checked available information from that source with the larger Compass database (which has over 95 % of all companies referenced and considered most reliable). Then, we randomly selected candidate companies to be surveyed being listed in both databases. Eventually, the companies retained are considered more environmental conscious than the rest. The other method was to use a more random and statistically larger compass database list as a starting point without the intentional environmental criteria bias. We did not choose that approach, while there would have been more companies to choose from, we believe that much fewer of these listed would have responded and because most do not have an environmental policy. Moreover we would have had a problem getting more than 5 or 10% of surveys at best having something to tell us from that general population about sustainable procurement.

Third, in designing the questionnaire: we were greatly influenced by practitioners from the first round table session which was held in Paris on September 20th, 2011, and the follow -up discussions held with them throughout the two test-runs (pre-phases) prior to the final run of the survey. Practitioners tend to know what is missing from their implementation – hence we recorded their original wishes: "we would love to help answer your questions as to how we are implementing sustainable procurement" also, since the data is ours, and we helped you get the answers "whatever you discover, if possible, needs to have some applicability to be useful to us" and the last statement from Zurich " Maybe you can develop some SP model, which anyone could use", and "that will allow us to assess where we are and how we compare to other SMEs." In retrospect, besides the fact that the answers collected were suitable for creating a model that by some coincidence matches the wishes of these SMEs, had these requests not been made, the questions

could have been different and the model would not exist. Also, while there may have been better questions available to ask to obtain answers we have no regrets to have followed our instincts in trusting practitioners in getting their contribution in the design of our questions.

Fourth, in selecting the region of the data sample: Because of our being located in Western Europe, we decided to survey only companies that are in the same geography as the data is readily available and from sources considered reliable by the research community. We did not explore Eastern Europe because time did not permit. The Hartmann group was kind enough to grant us access and give us a written permission to reuse some of their questions and analysis from a US survey of 2012 on sustainability and to test these questions with EU companies. We never managed to undertake a comparative analysis of the EU and the US markets but keep this in mind for a joint publication.

Fifth, as to the validity of answers based on demographics: In recording the procurement experts' answers: we gave more strategic weight to the vision of well-known Large company and larger SMEs managers having the overview and decision making for Sustainable Procurement than to the narrower perspective of the "procurement function practitioners" which in many SMEs were not procurement professionals. The narrow yet accurate procurement professional's perspective alone hides the larger perspective and aspects of TQM and a growing SME SP culture which are inseparable from company operations, brand image and profitability.

Sixth, on the company centric perspective of the answers: We asked companies about themselves and about their suppliers and their customers. At no time have we cross checked these answers directly with their suppliers or their customers, therefore the study has a voluntary bias centered around the company's vision of itself which may be quite different from the reality we might have obtained from asking the suppliers this question or asking customers to provide answers for the company. The 360 degrees approach of interviewing

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and surveying all sources is the most perfect, but could have worked if the company provided us with a list of suppliers and a list of customers to contact, but then one may have questioned if those answering were only —selected friends of the company with a bias to say good things while those not invited may have said bad things? We may never know the answer, and recognize this as a limitation to be resolved in future surveys on similar topics.

Finally, another factor that may limit the generalization of the results of the investigation is that there was no evidence as to whether the undertakings were in development or recession, or if the companies were new or old.

Future research should examine the criteria and the impact of sustainable procurement to companies that are characterized by recession or development and other sectors, such as services or the public sector. Also, the survey could be repeated in the same companies surveyed to confirm the long term positive or negative effects of sustainable procurement.

Finally, we propose relevant investigations be carried out in other countries with similar characteristics (eg Eastern Europe), in order to benchmark current practices.

### **7.4 Contributions to Theory**

In this conclusion chapter section we describe how the research results connect with current bibliography and theory. (Section 1.5 connecting and conclusion elements with current literature/bibliography and theory)

This research used the method of Grounding Theory Methodology as advocated by Thornberg [Thornberg 2014] and as described in introductory section 1.5 and at the beginning of the Methodology chapter 4. This research contributes to the theory of sustainable procurement strategy with practical implications for practitioners desiring to implement the proposed Model.

Specifically a source of external invalidity has been discovered which relates to the generalizability of experimental findings to the “real world”. Even if the results of the experiment are considered an accurate gauge of what occurred during that experiment, it really doesn’t tell us anything about the impact on life of these SP implementations. The generalization of SP environmental claims

findings is shown to be jeopardized when third parties (NGOs, partners, competitors, etc.) interact between the testing situation and the experimental stimulus.

Besides the Funnel Model for SMEs and the European Map of SP implementations the research created a unique view of how SP practitioners observe the field, as broken down into two categories:

- 1) The “Ex-Post Facto” Analysis (After the fact research and data capture of Customer Added-Value versus Company Added-Value/Utility)
- 2) The “A-Priori” Forecast based on the Interviews Field Experiment

As summarized in the “Is”, “Must” and “Should” diagrams of chapter 6. Hence the study also identified that creative strategies need to be developed for companies’ action plans based on these ex-post and a-priori forecast projections to succeed being positioned in the High/High Value Added Quadrant and that research through case studies needs to validate these findings in future research. Overall our research matches conclusions of other experts in the field [Wolf J. 2014 & (Zhaohui W. et al 2011)].

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## Appendix A: Guttman Scalogram for SP in SMEs.

(0.812 Cronbach Alpha for these 13 variables)

Variables	Guttman Phase in line with Deming's PDCA Wheel.	Item	SD	D	U	A	SA
			1 N	2 O	3 Y	4 E	5 S
1	Plan	Do you have an Environmental Policy?					
2	Plan	Does your Management Understand Sustainable Procurement?					
3	Plan	Do you have a Sustainable Procurement Culture for your Employees?					
4	Plan	Do you Believe that Sustainable Procurement Increases Sales?					
5	Do	Have you trained your Employees in Sustainable Procurement?					
6	Do	Are your suppliers conforming to your Environmental policy?					
7	Do	Have your Suppliers been trained in Sustainable Procurement?					
8	Do	Are you more innovative in SP than others in your industry?					
9	Check	Would NGOs rate you positively on your environment policy claims?					
10	Check	Do you have tools and metrics to measure SP performance?					
11	Act	Do you use a TQM innovation infrastructure for SP improvement?					
12	Act	Do you use common industry standards and occasionally cooperate with competitors for SP?					
13	Act	Do you use R&D to improve future products?					

Lickert ordered Key: SD=Strongly Disagree, D=Disagree, U=Undecided, A=Agree, SA=Strongly Agree, Scale converted to Dichotomous, "No" (1-2) and "Yes" (3-5) for Guttman Scalogram.



### Appendix B: Table of SMEs Surveyed on SP by Country and Industry.

Alphabetic list of SMEs' Country of origin	Total from all categories of country SMEs who responded to SP survey	Percent of all 429 SMEs who responded	Total of Food & Beverage SMEs	Total of Food Only SMEs	Total of Beverage Only SMEs
Austria	15	3,5	4	8	3
Belgium	43	10,0	11	10	22
Denmark	41	9,6	21	13	7
Finland	21	4,9	11	0	10
France	69	16,1	26	1	42
Germany	15	3,5	8	1	6
Greece	5	1,2	3	2	0
Ireland	12	2,8	3	9	0
Italy	24	5,6	10	1	13
Luxembourg	6	1,4	1	4	1
Netherlands	21	4,9	5	13	3
Norway	25	5,8	9	13	3
Portugal	19	4,4	8	5	6
Spain	47	11,0	21	15	11
Sweden	20	4,7	1	14	5
Switzerland	33	7,7	9	18	6
UK	13	3,0	6	1	6
<b>Totals</b>	N=429	100%	157	128	144

Of the 429 SMEs, 289 are either Micro (<10 employees) & Small SMEs (<50 employees), and 140 are Medium SMEs (<250 employees).

**Appendix C: Table of Variables Correlations for 429 F&B SMEs.**

Spearman's rho correlations - with N=429															
High Corr.	Low Corr.	No Corr.	Do you have an Environmental Policy ?	Does your Management Understand SP ?	Do you have a SP Culture for your Employees ?	Do you Believe that SP Increases Sales ?	Have you trained your Employees in SP ?	Are your suppliers conforming to your Environmental policy ?	Have your Suppliers been trained in SP ?	Are you more innovative in SP than others in your industry ?	Would NGOs rate you positively on your environment policy claims ?	Do you have tools and metrics to measure SP performance ?	Do you use a TQM innovation infrastructure for SP improvement?	Do you use common industry standards and occasionally cooperate with competitors for SP ?	Do you use R&D to improve future products ?
			V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13
V1	Do you have an Environmental Policy ?	Correlation	1,000	,311**	,189**	,251**	,264**	,293**	,163*	,100*	,332**	,182**	,048	,150**	,118*
		Sig. (2-tailed)		,000	,000	,000	,000	,000	,001	,039	,000	,000	,321	,002	,015
V2	Does your Management Understand SP ?	Correlation		1,000	,262**	,279**	,220**	,250**	,130*	,204*	,261**	,127**	,022	,266**	,250**
		Sig. (2-tailed)			,000	,000	,000	,000	,007	,000	,000	,009	,643	,000	,000
V3	Do you have a SP Culture for your Employees ?	Correlation			1,000	,339**	,401**	,167**	,397*	,398*	,207**	,489**	,296**	,197**	,260**
		Sig. (2-tailed)				,000	,000	,001	,000	,000	,000	,000	,000	,000	,000
V4	Do you Believe that SP Increases Sales ?	Correlation				1,000	,456**	,291**	,372*	,295*	,444**	,297**	,208**	,108*	,223**
		Sig. (2-tailed)					,000	,000	,000	,000	,000	,000	,000	,025	,000
V5	Have you trained your Employees in SP ?	Correlation					1,000	,229**	,497*	,403*	,260**	,389**	,244**	,148**	,265**
		Sig. (2-tailed)						,000	,000	,000	,000	,000	,000	,002	,000
V6	Are your suppliers conforming to your Environment	Correlation						1,000	,192*	,154*	,291**	,298**	,198**	,093	,132**
		Sig. (2-tailed)							,000	,001	,000	,000	,000	,055	,006

V7	Have your Suppliers been trained in SP ?	Correlation							1,000	,252*	,259**	,308**	,139**	,129**	,200**
		Sig. (2-tailed)								,000	,000	,000	,004	,007	,000
V8	Are you more innovative in SP than others in your industry	Correlation								1,000	,137**	,369**	,375**	,203**	,352**
		Sig. (2-tailed)									,004	,000	,000	,000	,000
V9	Would NGOs rate you positively on your environment	Correlation									1,000	,130**	,016	,066	,083
		Sig. (2-tailed)										,007	,749	,172	,086
V10	Do you have tools and metrics to measure SP performance	Correlation										1,000	,482**	,303**	,323**
		Sig. (2-tailed)											,000	,000	,000
V11	Do you use a TQM innovation infrastructure for SP	Correlation											1,000	,222**	,412**
		Sig. (2-tailed)												,000	,000
V12	Do you use common industry standards and	Correlation												1,000	,545**
		Sig. (2-tailed)													,000
V13	Do you use R&D to improve future products ?	Correlation													1,000
		Sig. (2-tailed)													

## **Appendix D: Summary of Original Publications**

### **D1: Publications During PhD Research Period 2010-2015**

- 1) **Sustainable Logistics: Challenges and Opportunities of Greening the Procurement Process** (with Professor Lambros Laios and Assistant Professor Socrates Moschuris) , 1<sup>st</sup> INTERNATIONAL CONFERENCE ON SUPPLY CHAINS, 1-2 October 2010, Katerini Greece.

**Abstract:** This paper presents some of the challenges and opportunities faced by many organizations worldwide in trying to embark in the purchasing of products and services that are less harmful to local and global environments. Many of these private and public businesses are working to improve the environmental performance of their operations and products and green procurement has been a logical extension of this work. The paper presents how green procurement can be used as a means towards improving their products and operations from the environmental perspective to reduce risk, total cost of ownership and improve supply chain performance. Examples of green initiatives from Greece are presented together with references to success stories from the private sector. Reference is made to the total life cycle cost, and the non-cost criteria in decision making, trends in green procurement and opportunities for further research, all leading to the never ending question of whether Green Procurement is the right decision or not at this point in time for particular private and public sector businesses.

- 2) **City of London 2007-2010 Green Public e-Procurement Project-Results & Perspectives** (with Professor Lambros Laios and Assistant Professor Socrates Moschuris) , 1<sup>st</sup> INTERNATIONAL CONFERENCE ON SUPPLY CHAINS, 1-2 October 2010, Katerini Greece.

**Abstract:** After years lagging behind Scandinavian and other European Cities, in 2007, the city of London took the courageous initiative to transform itself from a follower to a leader and advocate of Green Public Procurement. In this paper, now that enough data is available, we present how the 2007-2010 Green Public e-procurement project was structured; the goals, accountabilities, results of the procurement portfolio-analysis, the significance of business transformation with e-procurement, the local performance Indicators which were used and the initial spend results of the project.

Looking forward, reference is made to planned actions since 2009, regarding the future implementation of European Green Procurement directives and best practices from the supply-chain domain. Today, Green Procurement is the central core of the new centrally managed public e-procurement strategy of the city of London which promises to yield significant cost savings and improved efficiencies in the 2010-2013 timeframe.

**3) Green Procurement Best Practices on Influencing Suppliers to Act Sustainably: Monitoring Versus Collaboration** (with Professor Lambros Laios and Assistant Professor Socrates Moschuris) 2<sup>nd</sup> INTERNATIONAL CONFERENCE ON SUPPLY CHAINS, 5-6 October 2012, Katerini Greece.

**Abstract:** While seeking new sources of supplies, leading companies have been able to “squeeze” savings and have become much more exposed to risk. This risk commits their procurement departments to be more efficiently aligned with their suppliers in the process of influencing their suppliers to act sustainably. What is the “best practice”? There is no unanimity: one side argues it is achieved by means including monitoring, audits, enforcing compliance and other means. The other argues that control does not work well in these features of buyer-supplier relationships and require initiatives with collaboration, communication, trust, etc. The academic literature has seen several good articles on the broader subject; in particular to one we feel best describing the issues of both sides of the debate - Boyd, D.E. Spekman, R.E. Kamauff J.W. and Werhane P. (2007), corporate social responsibility in global supply chains: A procedural justice perspective, *Long Range Planning*, 40, 341-356. Preliminary results from case studies and interviews and merits are presented with a discussion where the most significant points are summarized. This exploration we believe assists the procurement practitioner to confirm or change their choices for a solution that is adapted to their particular business needs and circumstances.

**4) Sustainable Procurement from the Customer’s Perspective – Challenges and Opportunities** (2012), Harokopeio University Academic Volume of the Master’s Program “Sustainable Development” pp91-101, volume under the supervision of Professor Helen Theodoropoulou, and Harokopeio University Review committee of Professor George Xontrogiannis, Associate Professor Mitoula Roidou, and Assistant Professor Konstantinos Ampeliotis. ISBN: 978-969-86818-4-2

**Abstract:** The global economic, social and political backdrop is changing in 2011 and leading companies with sustainable procurement transform their suppliers into a key competitive advantage where cost, quality, production with less material, energy,

water, waste and pollution, delivery, recycling are constantly optimized. The Challenge of NGO's, advocacy groups, better informed customers realizing their purchasing power, and is a new Opportunity for companies as of 2012 to focus on their Customer's motivations, shared values and to engage them to express their needs and aspirations for a better environmental and social future that does not compromise individual values for the limited benefits of globalization.

**5) City of London 2007-2010 Green Public e-Procurement Project-Results & Perspectives,** (with Professor Lambros Laios and Assistant Professor Socrates Moschuris) OPERATIONS AND SUPPLY CHAIN MANAGEMENT, Vol. 4, No. 2/3, May/September 2011, pp. 123-134, ISSN 1979-3561|EISSN 1979-3871. (From our Katerini 2010 conference paper - extended - invited as best paper for publication in the Journal)

**Abstract:** After years lagging behind Scandinavian and other European Cities, in 2007, the city of London took the courageous initiative to transform itself from a follower to a leader and advocate of Green Public Procurement. In this paper, now that enough data is available, we present how the 2007-2010 Green Public e-procurement project was structured; the goals, accountabilities, results of the procurement portfolio-analysis, the significance of business transformation with e-procurement, the local performance Indicators which were used and the initial spend results of the project. Looking forward, reference is made to planned actions since 2009, regarding the future implementation of European Green Procurement directives and best practices from the supply-chain domain. Today, Green Procurement is the central core of the new centrally managed public e-procurement strategy of the city of London which promises to yield significant cost savings and improved efficiencies in the 2010-2013 timeframe.

Keywords: city of London, green procurement project, e-procurement, portfolio analysis, performance Indicators.

**6) A model to measure SMEs sustainable procurement implementations from a study of western European food and beverage companies.** (with Professor Lambros Laios and Associate Professor Socrates Moschuris) (2015)

Accepted, 24/3/2015 under positive suggestion from reviewers, for publication to the Journal of Regional Socio-Economic Issues (JRSEI) Volume 5, Issue 3, (September 2015) (impact factor 1,37) without any modifications.

**Abstract:** Purpose: This study investigates the nature and type of daily sustainable procurement implementations of small- and medium-sized enterprises (SMEs) located in Western Europe including Switzerland to identify the state of their maturity. Design/methodology/approach: The Empirical Study of Food and Beverage companies operating in 2012 and 2013 in Western Europe including Switzerland collected the data through the use of a quantitative web survey and qualitative interviews of respondents. The companies targeted for the survey came from the European Chambers of Commerce 2012 self-ranking database of their members (where members self-evaluated their companies as "Sustainable" for matching criteria such as "Having an Environmental Policy," "Reducing Energy and Water Consumption" and

"Performing Recycling"), were the search was further restricted to companies belonging to the Food and Beverage industry operating in Western Europe and Switzerland having a total employee count of less than 250 and yearly revenue up to 50 Million Euros. (SME as defined by the EU commission). We had a response rate of 19,41% with 429 SMEs questionnaires received kept for further analysis. Findings: 1) SMEs also practice sustainable procurement like large companies. 2) SMEs that have sustainable procurement tend to have tools and metrics to measure SP results and estimate they are profitable. 3) The best of these SMEs apply Total Quality Management (TQM) principles in their operations and invest in training of their sales and procurement staff. 4) A model of 13 questions reflects on the state of sustainable procurement in European Food and Beverage SMEs. The applicability of the resulting model inspired from the Guttman Scalogram should prove helpful for SMEs.

- 7) Sustainable Procurement Adding Value to Consumers in Times of Economic Crisis**, (2015), (with Professor Lambros Laios and Associate Professor Socrates Moschuris) Published in Bentham Science Editor's eBook entitled: "Markets, Business and Sustainability", Editor(s): Ilias P. Vlachos and George Malindretos - DOI: 10.2174/97816810802531150101 - eISBN: 978-1-68108-025-3 - ISBN: 978-1-68108-026-0 pages 145-150).

**Abstract:** Sustainable Procurement has been an excellent tool for companies to provide solutions to consumers where cost, quality, production with less material, energy, water, waste and pollution, delivery, recycling are constantly optimized. The economic crisis has made some consumers more demanding and some of those accustomed to sustainability are unable to afford solutions they once afforded. After discussing the characteristics of the changing Consumer, Sustainable procurement strategy factors, and consumption and sustainability (Sanne 2002), while making reference to numerous existing studies and literature reviews, we propose a new four level model for sustainable procurement that captures a wider spectrum of Consumers to include low and medium income Consumers.

- 8) Is Sustainable Procurement Profitable? Competing views and Market opportunities**, (with Professor Lambros Laios and Associate Professor Socrates Moschuris), 1<sup>st</sup> International Conference on Agrifood SCM and Green Logistics, 27-30 May 2015, Porto Carras Greece – submitted abstract – awaiting reviewer approval to submit final article by April 2015.

**Abstract:** Increased customer demands for companies to implement sustainable procurement have pressured companies and their suppliers to be accountable on their social, ethical, labor and environmental practices while minimizing pollution and preserving the environment for future generations, yet not all implementations have been profitable. A review of literature shows competing views as to the value of that investment: a) some authors fail to make the business case ([1] Sharma, (2000), b) others claim there is profitability ([2] Dyllick, T. and Hockerts, K. (2002), [3] Christopher Laszlo, (2008), [4] Charles O. Holliday, Stephan Schmidheiny, Philip Watts (2002), c) others go into great lengths while examining the relationship between financial performance (FP) and environmental (EP) or social performance (SP) to argue that while the benefits of sustainable / green procurement vary from company to company most theoretical and empirical research have been inconclusive ([5] Salzmann O., Ionescu-somers A., Steger U., (2005), We examine these views together

with the various circumstances and timing that would create the right conditions for food and beverage companies to reduce costs and waste, increase sales, and be in a position to competitively leverage most current and future market opportunities.

Keywords: Sustainability, procurement, Added Value, Risk Mitigation



## **D2: Publications Prior to PhD (2004 to 2009)**

- 1) Information Technology and Regional Sustainable Development in Greece,** (with Ass. Prof. Chr. Ladias, *WSEAS International Conference on Energy, Environment, Ecosystems and Sustainable Development*, Vouliagmeni, Athens, Greece, July 11-13 2006 (paper 535-196, 7 pages on Proceedings CD).

**Abstract:** The article discusses Information Technology (IT) and its impact on Regional Development in Greece. Information Technology together with making people's lives easier and better with short term benefits in many areas from Academics, Science, Culture, Tourism and Travel, Banking and the Economy has in other areas of life brought about new sets of issues and problems no one had anticipated. After some years of confrontation of the benefits and issues brought about by IT to regional development, we look at the issues of decentralization and technological change as well as the issues of mans' relationship with the machine as far as his individuality and the power associated with using information Technology. We conclude with a new approach suggesting a new model focusing on the exploitation of the strengths of Information technology being enlisted at the service of the Greek Economy thus enabling sustainable socio-economic improvements to several regions of Greece in the Decentralized European Union of Tomorrow.

- 2) Habitat and Ecology in Modern France,** (with Prof. E. Stamatiou), *WSEAS International Conference on Energy, Environment, Ecosystems and Sustainable Development*, Vouliagmeni, Athens, Greece, July 11-13 2006 (paper 535-218, 6 pages on Proceedings CD).

**Abstract:** The ecological habitat is respectful of man and nature. It fits in the logic of sustainable development of the planet with several objectives: the wellbeing of the users, the safeguarding of the environment, a sparing use of the raw materials, the control of waste and the reduction of emissions gas causing the greenhouse effect. This citizens' initiative emphasizes the richness of the cultural inheritance, and the social and economic richness of the local community. In this paper we present the elements of the philosophy of the Habitat and Ecology which are central to the French Ecological Architectural Movement which has in recent years become the major trend in modern French Regional and Town Planning.

- 3) Architecture, Green Design & Sustainability – Concepts and Practices,** (with Prof. E. Stamatiou), *IASME / WSEAS International.Conference* Agios Nikolaos, Crete Island, Greece, July 24-26, 2007, *WSEAS TRANSACTIONS on Energy, Environment, Ecosystems And Sustainable Development (EEESD'07)*, paper 562-079 (8 pages on Proceedings CD).

**Abstract:** This paper discusses the concept of “Sustainable Architecture” and of “Green Design”. It makes a special reference to heating, ventilating and cooling systems efficiency, to sustainable building materials and recycling and to waste management. Reference is made to improved energy efficient building designs with examples of the passive solar building design with the three approaches of direct, indirect and isolated solar gains and to active solar building design. A comparison of solar technologies is attempted with a discussion of the passive house concepts and practices and how that technology compares with the Active solar technology, with reference to details from Ireland’s Glengarriff Active Solar House project.

- 4) Concepts & Practices of French Space Technology for Sustainable Development,** (with Prof. E. Stamatiou), *IASME / WSEAS International.Conference*, Agios Nikolaos, Crete Island, Greece, July 24-26, 2007, *WSEAS TRANSACTIONS on Energy, Environment, Ecosystems And Sustainable Development (EEESD'07)*, (10 pages on Proceedings CD).

**Abstract:** In this paper we examine the concepts and Practices of French Space Technology for “Sustainable Development” from the perspective of Satellite Remote Sensing as an innovative means to achieve Sustainable Development. The 6 key themes of France’s Sustainable Development Policy are presented and the fundamental role of the French Space Agency CNES in support of the mission of the French Ministry of the Ecology and of Sustainable Development. The latest EMAS and ISO 14001 certification efforts are not omitted, nor the Innovative Energy Technology used at the CNES Toulouse Space Center. We illustrate the strategy with examples from precision agriculture to rising sea level tracking millimeter variations to environmental degradation, natural hazards and in support of the Kyoto protocol on climate change. Capabilities of modern satellites SPOT-5, Formosat-2, Kompsat-2 and HELIOS-1B for monitoring the earth by the French Space Agency CNES and its subsidiary SPOT Image are also presented.

- 5) **Green Procurement and Entrepreneurship**, Χαροκόπειο Πανεπιστήμιο, επιστημονική ημερίδα “Επιχειρείν-καινοτομείν” 15 Μαΐου 2008, 23 pages, (Πρακτικά σε CD), Αθήνα.

**Abstract:** This paper presents the effort that many organizations worldwide are making to purchase products and services that are less harmful to local and global environments. Many of these private firms are working to improve the environmental performance of their operations and products and green procurement has been a logical extension of this work. The paper presents how green procurement is used by them as a means towards improving their products and operations from environmental perspective to reduce risk, total cost of ownership and improve supply chain performance. Examples of green initiatives from Greece are presented together with references to sustainable development theory and concepts. The traditional supply positioning model is explained towards a proposed adaptation of that model to support the three dimensions of sustainable development (Environment, Economic, and Social) for Green Procurement. Results from this research are presented and entitled as “Green Supply Positioning Decision Matrix” where percentages are used to qualify procured goods and services for these three dimensions within the traditional supply chain model, but with one major difference: that the Spend dimension refers no longer to just initial acquisition cost, but to the total life cycle cost. Green Entrepreneurship profiles from recent publications are then presented together with a green entrepreneur typology and Influencers on the Green Entrepreneur from the Manchester Metropolitan University Business School. All leading towards a discussion of trends in green procurement and opportunities for further research.

### D3: Books by the same Author

The Link: <https://www.skroutz.gr/books/a.84408.Lacroix-Richard-Nicolas.html>

gives access to the following:

- 1) **Green Procurement** (2010) in Greek, sole author



- 2) **Food and the Consumer** (2009) in Greek, co-author



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## Appendix E: Abbreviations/Glossary

The majority of Glossary definitions in this appendix are reproduced here thanks to the kind contributions of the sustainability consortium ([www.sustainabilityconsortium.org/food-beverage-agriculture/](http://www.sustainabilityconsortium.org/food-beverage-agriculture/)) :

**Biodiversity Metrics Development:** Review of existing biodiversity and land-use metrics and evaluation of potential for use in Standards for Measurement and Reporting (SMRS) and as Sustainability Performance Drivers (SPD). Identify gaps or research needs in metrics, driver, and indicator development. Pursue avenues to fill those gaps via collaborations with researchers, NGO experts and corporate/retail leaders. (e.g. leaders in the US: Coca-Cola, General Mills, Inc., Kellogg's, Mars, Inc., McDonald's, Miller Coors, Monsanto Company, PepsiCo, Inc., Unilever, etc. Source: <http://www.sustainabilityconsortium.org/food-beverage-agriculture/>)

**Consumer:** A Consumer is an individual member of the general public, who is purchasing or using goods, property, or services for private purposes.[1] Footnotes: 1. International Organization for Standardization. (2006c). ISO 14025: Environmental labels and declarations - Type III environmental declarations - Principles and procedures. ISO: Switzerland.

**Ecoinvent:** Ecoinvent is a database developed by the Swiss Centre for Life Cycle Inventories. The database accommodates approximately 4,000 databases for products, services, and processes often used in LCA case studies. [1] Footnotes, 1. Frischknecht, R. & Jungbluth, N. (2007). Overview and methodology. Swiss Centre for Life Cycle Inventories, 77p.

**Ecolabel:** An ecolabel is a voluntary approach to environmental certification of products meeting specific criteria or standards. Ecolabels can be classified in single attribute or multi-attribute standards. According to the International Organization for Standardization[1] three main types of environmental labels exist, including product category based on life cycle, informative self-declaration claims, and third-party accredited labels based on quantified environmental data of a product. Footnotes: 1. International Organization for Standardization. (2006c). ISO 14025: Environmental labels and declarations -

Type III environmental declarations - Principles and procedures. ISO: Switzerland.

**Ecosystem Quality:** Ecosystem quality includes measurable attributes from an ecosystem performance including biodiversity, ecosystem functions, and ecological resources.[1] : Footnotes 1. Koellner, T. (2002). Land use in product life cycles and its consequences for ecosystem quality. International Journal of Life Cycle Assessment, 7(2), 130.

**Environmental Aspect:** An environmental aspect is an element of an organization's activities, products or services that can interact with the environment [1]. Footnotes: 1. International Organization for Standardization. (2006). ISO 14040: Environmental management - Life cycle assessment - Principles and framework. ISO: Switzerland.

**Environmental Impact:** An environmental impact is any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects. [1] Footnotes: 1. International Organization for Standardization. (2004). ISO 14001: Environmental Management systems - Requirements with guidance for use. ISO: Switzerland.

**Environmental Label or Environmental Declaration:** An environmental label or declaration is a claim that indicates the environmental aspects of a product or service. An environmental label or declaration may take the form of a statement, symbol or graphic on a product or package label, in product literature, in technical bulletins, in advertising or in publicity, amongst other things. [1] Footnotes: 1. International Organization for Standardization, (2000). ISO 14020: Environmental labels and declarations - General principles. ISO: Switzerland.

**Fair Trade:** Crops produced according to principles in which poor farmers in developing countries receive fair prices for their products, workers enjoy safe working conditions and fair wages, communities receive development assistance and investment in social programs and crops are grown with sustainable farming methods and without the use of pesticides or genetically modified organisms. Products labeled as "Fair Trade Certified" are verified and audited by an independent certifier. Fair Trade Certification is currently

available in the United States for coffee, tea and herbs, cocoa and chocolate, fresh fruit, sugar, rice and vanilla. Source: [http://www.oprah.com/article/world/environment/informed\\_glossary\\_az/2](http://www.oprah.com/article/world/environment/informed_glossary_az/2) [accessed 16 December 2009]

**FBA:** Acronym for Food, Beverage, and Agriculture Sector, Source: <http://www.sustainabilityconsortium.org/glossary/> [accessed 29 December 2012] - **Food, Beverage, and Agriculture Sustainability Measurement and Reporting Standard (FBA SMRS):** Standardized method to evaluate and report product life cycle information for food, beverage, and agriculture products. Prototype product families include: Breakfast Cereal, Flavored Yogurt, Fruit Juice.

**Green Washing:** Green washing is a form of corporate misrepresentation where a company will present a green public image and publicize green initiatives that are false or misleading. A company might release misleading claims or even true green initiatives while privately engaging in environmentally damaging practices. Companies are trying to take advantage of the growing public concern and awareness for environmental issues by promoting an environmentally responsible image. Green washing can help companies win over investors (especially those interested in socially responsible investing), create competitive advantage in the marketplace, and convince critics that the company is well-intentioned. There is a profit-driven motive to green washing as well— green products are among the fastest growing segments in the market and present a huge potential for growth. The increase in green advertising claims has become a cause for concern at the Federal Trade Commission, who planned to begin re-evaluation of existing green marketing guidelines in 2008. Source: <http://www.ecomii.com/ecopedia/greenwashing> [accessed 16 December 2009]

**ISO 14000:** Commonly referred to as "ISO 14000", there are actually two relevant standards: - ISO 14001: Environmental management systems -- Requirements with guidance for use[1] - ISO 14004: Environmental management systems -- General guidelines on principles, systems and support techniques[2]. ISO 14001 provides the baseline requirements to

which an Environmental Management System (EMS) can be audited to, while ISO 14004 provides more detailed guidelines and suggestions concerning implementation. Footnotes: 1. International Organization for Standardization. (2004). ISO 14001: Environmental Management systems - Requirements with guidance for use. ISO: Switzerland. 2. International Organization for Standardization. (2004). ISO 14001: Environmental Management systems - Requirements with guidance for use. ISO: Switzerland.

**ISO 14020:** ISO 14020 - Environmental labels and declarations - General principles,[1] has the following purpose: "This International Standard establishes guiding principles for the development and use of environmental labels and declarations. It is intended that other applicable standards in the ISO 14020 series be used in conjunction with this International Standard." Thus 14020 serves as a foundation, to be used in conjunction with either: - ISO 14024 for Type I environmental product declarations (EPD), - ISO 14021 for Type II EPDs, or - ISO 14025 for Type III EPDs. Footnotes 1. International Organization for Standardization, (2000). ISO 14020: Environmental labels and declarations - General principles. ISO: Switzerland.

**ISO 14021:** ISO 14021 – Environmental labels and declarations – Self-declared environmental claims (Type II environmental labeling)[1] has the following purpose: "This International Standard specifies requirements for self-declared environmental claims, including statements, symbols and graphics, regarding products. It further describes selected terms commonly used in environmental claims and gives qualifications for their use. This International Standard also describes a general evaluation and verification methodology for self-declared environmental claims and specific evaluation and verification methods for the selected claims in this standard." Footnotes: 1. International Organization for Standardization (ISO). (1999). ISO 14021: Environmental labels and declarations – Self-declared environmental claims (Type II environmental labeling). ISO: Switzerland.

**ISO 14024:** ISO 14024 - Environmental labels and declarations - Type I environmental labeling - Principles and procedures [1] has the following purpose: "This International Standard establishes the principles and



procedures for developing Type I environmental labeling programs, including the selection of product categories, product environmental criteria and product function characteristics; and for assessing and demonstrating compliance. This International Standard also establishes the certification procedures for awarding the label." Footnotes: 1. International Organization for Standardization. (1999). ISO 14024: Environmental labels and declarations – Type I environmental labeling Principles and procedures. ISO: Switzerland.

**ISO 14025:** ISO 14025 – Environmental labels and declarations – Type III environmental declarations – Principles and procedures[1] has the following purpose: "This International Standard establishes the principles and specifies the procedures for developing Type III environmental declaration programs and Type III environmental declarations. It specifically establishes the use of the ISO14040 series of standards in the development of Type III environmental declaration programs and Type III environmental declarations." Footnotes: 1. International Organization for Standardization. (2006). ISO 14025: Environmental labels and declarations – Type III environmental declarations – Principles and procedures. ISO: Switzerland.

**ISO 14040:** ISO 14040 – Environmental management – Life cycle assessment – Principles and framework [1] has the following purpose: "This International Standard describes the principles and framework for life cycle assessment (LCA)." Footnotes 1. International Organization for Standardization. (2006). ISO 14040: Environmental management – Life cycle assessment – Principles and framework. ISO: Switzerland.

**ISO 14044:** ISO 14044 – Environmental management – Life cycle assessment – Requirements and guidelines.[1] ISO 14044 covers the same elements as ISO 14040. Whereas 14040 provides principles and a framework, ISO 14044 specifies requirements and guidelines. Footnotes 1. International Organization for Standardization. (2006). ISO 14044: Environmental management – Life cycle assessment – Requirements and guidelines. ISO: Switzerland.

**Life Cycle:** Life cycle is consecutive and interlinked stages of a product system, from raw material acquisition or generation from – spacing-natural

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resources to final disposal [1]. Footnotes 1. International Organization for Standardization. (2006). ISO 14040: Environmental management – Life cycle assessment – Principles and framework. ISO: Switzerland.

**Life Cycle Assessment (LCA):** A life cycle assessment (LCA, also known as life cycle analysis, ecobalance, and cradle-to-grave analysis) is the investigation and evaluation of the environmental impacts of a given product or service caused or necessitated by its existence [1]. Footnotes: 1. Graedel, T.E. & Allenby, B.R. (2003). Industrial Ecology. Pearson Education, Inc.: Upper Saddle River, New Jersey.

**Localvore:** The term localvore describes someone who adheres to a local diet. A localvore only eats food grown within a specific nearby area, buying fresh, usually organic produce directly from farmers and small markets. Localvores often enjoy relationships with local farmers, whose presence is essential to the ecological diversity and sustainability of the region, and their avoidance of large-scale farms and transportation costs reduces the carbon impact of their eating. Source: <http://www.ecomii.com/ecopedia/localvore> [accessed 16 December 2009]

**Natural Resource Depletion:** Natural resource depletion is the measurable impacts of natural resources extracted from ecosystems in the form of materials for production activities. These impacts can be associated with current biodiversity, ecosystem functions, and ecological resources.[1] Footnotes 1. Vincent, J.R., Panayoyou, T., & Hartwick, J.M. (1997). Resource depletion and sustainability in small open economies. Journal of Environmental Economics and Management, 33(1), 274-286.

**NGO - Non-Governmental Organization:** An NGO is an independent, voluntary association of people acting together on a continuous basis, for some common purpose, other than achieving government office, profit generation, or illegal activities.[1] Footnotes 1. Willetts, P. (2002). What is a non-governmental organization? Output from the Research Project on Civil Society, 12p. London.

**Organic:** USDA Certified Organic foods and farms cannot use most synthetic or petroleum derived pesticides and fertilizers, any irradiation, or sewage

sludge. No genetic engineering is allowed. Organic farmers use crop rotation, tilling and natural fertilizers, such as compost. A USDA-accredited certifier verifies that a farmer or producer meets the standards of the USDA National Organic Program. Source: <http://www.ecomii.com/ecopedia/organic> [accessed 16 December 2009]

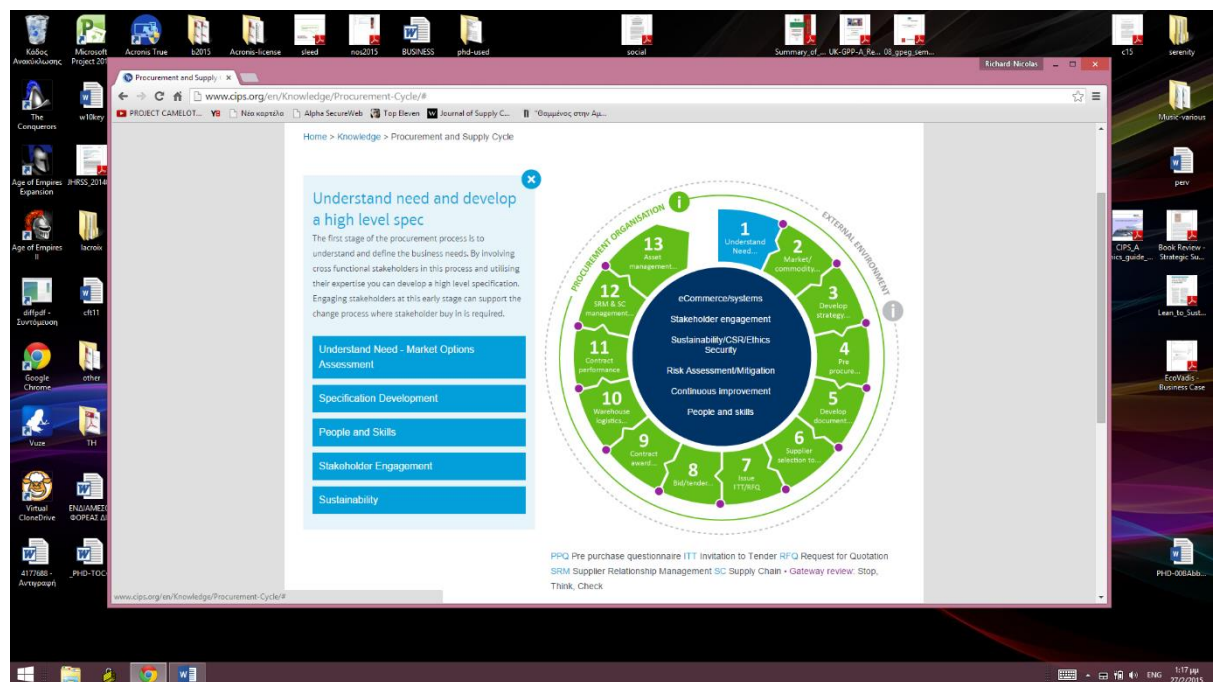
**Performance Driver (also referred to as SPD - Sustainability Performance Driver):** A performance driver is an accepted product or product supply chain attribute that has verifiable influence on a given aspect result greater than the noise of uncertainty. Ideally, Performance Drivers are used to reduce the magnitude of a product's hotspot. Due to the complex nature of supply chains and immaturity of measurement methods, some Performance Drivers must begin as Performance Indicators. Once Performance Indicators have statistically verifiable results on total impact, they can be considered Performance Drivers. Performance Drivers also enable product differentiation in a quantitative Footprint (e.g. Energy Footprint). The Baseline Model is adjusted using Performance Drivers to achieve a unique Product Footprint. Example Performance Drivers include the following: Cold Formulated Laundry Detergent, Computer Example: More than one disc drive (adds to manufacturing energy), Shelf stable milk (adjusts energy in distribution and retail baseline)

**Performance Indicator (also referred to as SPI - Sustainability Performance Indicator):** A performance indicator is a qualitative or quantitative piece of information about results or outcomes associated with the organization or product that is comparable and can demonstrate change over time. At the product level, performance indicators are used to demonstrate direction progress towards improved product performance but cannot easily be linked to quantifiable impacts. Due to the complex nature of product supply chains, Performance Indicators are used to show directional progress and relative performance towards organization goals. As supply chain reporting, traceability and measurement methods become more robust and accurate some Performance Indicators may evolve into Performance Drivers. Example Performance Indicators include the following: Total annual direct energy

consumption by primary energy source (Source: GRI), Company has an energy management plan and has verifiable energy reduction goals, Company funds and actively supports research and education programs that teach low-impact practices to raw material suppliers, Product contains only FSC certified wood products. It is important to note that there are several options for Performance Indicators, including a single value, an upper limit, a lower limit, a range of values, and a percentage of a specific quantity or value. Indicators can be compared to the same indicator but cannot be compared to different indicators. Multiple indicators can only be combined using a weighting algorithm.

**Primary Packaging:** First-level product packaging, such as a bottle, can, jar, tube, box, etc., contains the item being sold. It first envelops the product and is in direct contact with the contents. This usually is the smallest unit of distribution and is the last packaging material to be disposed of by the consumer.

**Procurement and Supply Cycle:** The Procurement cycle is the cyclical process of key steps when procuring goods or services, from identification of a need and conducting market analysis through to the process of selecting the supplier, managing their performance and reviewing lessons learnt.



Source: <http://www.cips.org/en/Knowledge/Procurement-Cycle/>

**PPQ** Pre purchase questionnaire **ITT** Invitation to Tender **RFQ** Request for Quotation **SRM** Supplier Relationship Management **SC** Supply Chain • Gateway review: Stop, Think, Check

**Recycling:** Collecting and reprocessing a resource so it can be used again. An example is collecting aluminum cans, melting them down, and using the aluminum to make new cans or other aluminum products. U.S. Environmental Protection Agency (December 1997) Terms of Environment: Glossary, Abbreviations and Acronyms. Source: <http://www.epa.gov/OCEPaterms/> [accessed 16 December 2009]

**Reforestation:** Planting of forests on lands that have previously contained forests but that have been converted to some other use. U.S. Environmental Protection Agency (December 1997) Terms of Environment: Glossary, Abbreviations and Acronyms. Source: <http://www.epa.gov/OCEPaterms/> [accessed 16 December 2009]

**Stakeholder:** Stakeholders are defined broadly as those groups or individuals, (a) that can reasonably be expected to be significantly affected by the organization's activities, products, and/or services, or (b) whose actions can reasonably be expected to affect the ability of the organization to successfully implement its strategies and achieve its objectives. [1]: Footnotes 1. Global Reporting Initiative. (2011). Sustainability Reporting Guidelines. The Netherlands.

**Stakeholder Concerns:** Stakeholder concerns are dossier hotspots that are based on expert opinion, popular press or stakeholder opinions. Since these dossier hotspots are not supported by strong enough evidence to be category sustainability profile (CSP) hotspots, they are included on CSPs as stakeholder concerns. See CSP construction procedure for details.

**Sustainability:** Sustainability is the overarching concept of meeting the needs of the present without compromising the ability of future generations to meet their needs.[1] [2] Footnotes 1. World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press: Oxford, GB. 2. European Commission. (2011). Life Cycle Thinking and Assessment

Glossary. Institute for the Environment and Sustainability.

**Sustainable:** Meeting the needs of the present without diminishing the ability of future generations to meet their needs. Sustainability also means that human practices do not result in the permanent damage, alteration or depletion of the environment, ecosystems, species or natural resources. Source:[http://www.oprah.com/article/world/environment/informed\\_glossary\\_az/4](http://www.oprah.com/article/world/environment/informed_glossary_az/4) [accessed 16 December 2009]

**Sustainable Value (Added) Procurement (SVP):** Is the process of Adding Value for the Final Food & Beverage Customer (Consumer) by procuring Environmental & Socially sustainable products and services - as opposed to historically traditional non sustainable procurement practices which contribute to the destruction of the environment and/or support non Ethical sourcing business practices.

**Sustainable Products:** Sustainable products are consumer goods designed, manufactured, and sourced under process guidelines, based on the efficient use of natural resources, the minimization of all kinds of waste, and the reduction of negative impact in surrounding communities along their life cycle.

## Appendix F: Questionnaire

NON-PROFIT RESEARCH SURVEY of Western European Companies in the Food & Beverage Industry, conducted by the University of Piraeus, Greece. (Survey version 5.0 - October 7th 2012 - May 10 2013)

SENT TO: Procurement Management or Management Responsible for the Procurement Function.

COUNTRIES: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK, Other.

DEFINITION: Sustainable Value (Added) Procurement (SVP): Is the process of Adding Value for the Final Food & Beverage Customer (Consumer) by procuring Environmental & Socially sustainable products and services - as opposed to historically traditional non sustainable procurement practices which contribute to the destruction of the environment and/or support non Ethical sourcing business practices.

THIS SURVEY LOCATION:

<https://docs.google.com/spreadsheet/embeddedform?formkey=dGxhelh6c1NlYWFzalJ1RVEtdm93cnc6MA>

QUESTIONS / COMMENTS: Richard LACROIX - Email: rlacroix@unipi.gr  
Tel: +30-210-9858278 Mobile: +30-6937258071

TRANSLATION OF SURVEY:

<http://i45.tinypic.com/166khoh.jpg>

Deutsche Übersetzung des Forschungsvermessungstextes und Bezweifelt - Internetverbindung

[https://docs.google.com/file/d/0B6C2pPcND\\_HOUDIFVzN0dTZYbE0/edit](https://docs.google.com/file/d/0B6C2pPcND_HOUDIFVzN0dTZYbE0/edit)

FRENCH TRANSLATION OF SURVEY:

<http://i45.tinypic.com/2i749d1.jpg>

Traduction française du Texte de l' Enquête de Recherche et Questions - Lien Internet

[https://docs.google.com/file/d/0B6C2pPcND\\_HOVkpUb2RrNlpVSVE/edit](https://docs.google.com/file/d/0B6C2pPcND_HOVkpUb2RrNlpVSVE/edit)





## **Appendix G: Related Quality Standards**

This appendix will discuss some of the underlying standards which relate to our domain of research and which will be discussed briefly here so as to provide some background as to the requirements for companies operating in Western Europe with regards to HACCP and Food and beverage best practices used by some of the best in class of the sampled companies which participated in our research. There are four introductory sections to this chapter, namely:

G.1 European Food Safety

G.2 HACCP, ISO standards (9000, 22000, 14001 & EMAS )

G.3 Risk Management

### **G.1 European Food Safety**

This segment of paragraphs on European Food Safety are taken from an article on food safety from [www.eufic.org](http://www.eufic.org).

“The European Union (EU) and the World Health Organisation (WHO) both consider Food Safety to be a “shared responsibility from Farm to Fork”.

From a company perspective, the quality and safety of food depends on the efforts of everyone involved in the complex chain of agriculture production, processing, transport, food production, preservation and consumption.

From a consumer’s perspective, we must realize that Western European lifestyles are vastly different from those of the past 40 years. The fast pace of modern lifestyles and the increase in single-person households, one-parent families and working women have lead to changes in the food preparation and consumption habits. A positive outcome of this has been rapid advances in food technology, processing and packaging techniques to help ensure the safety and wholesomeness of the food supply as more convenient food. In spite of these advances, contamination of the food supply by either naturally occurring or accidentally introduced contaminants or malpractice does occur » (see : <http://www.eufic.org/article/en/food-safety-quality/safe-food-handling/expid/basics-food-safety/>).

Thus, for companies to maintain the quality and safety of food throughout the food chain requires both operating procedures to ensure the wholesomeness of food and monitoring procedures to ensure operations are carried-out as intended. The next 4 sections G1.1 – through G1.4 are This section is made available thanks to the kind contribution of [www.stepsystems.co.uk](http://www.stepsystems.co.uk) :

#### G.1.1 EU Legal Framework and Regulations

The EU food safety policy encompasses the whole of the animal and human food chain. It provides extensive legislation and outlines the responsibility of producers and suppliers in helping to ensure a safe quality of the food supply. The EU regulations are amongst the most stringent in the world.

In order to make the area of food regulation more transparent and scientific, there was an overhaul of the EU food safety framework since the late 1990s. In 1997, a new scientific advisory system for the EU was established. Eight new Scientific Committees were appointed in addition to a Scientific Steering Committee. The European Food Safety Authority (EFSA) was established in 2002. The EFSA is an independent body that works in close cooperation with various scientific agencies and institutions in EU member states providing independent scientific advice on all matters with a direct or indirect impact on food safety. It covers all stages of food production and supply, from primary production right through to the supply of food to consumers. The EFSA also carries out assessments of risks to the food chain and scientific assessment on any matter that may have a direct or indirect effect on the safety of the food supply, including matters relating to animal health, animal welfare and plant health.

#### G.1.2 Agriculture and Transport

The quality of raw materials is crucial to ensure the safety and quality of the final product. Therefore, a systematic approach is needed from farm to fork in order to avoid contamination of foodstuffs and to identify potential hazards.

From the farm/trade, agriculture produce is transported to food processing industry. This step of the food chain is covered by legislation on quality standards:

- The European Union's legislation on the preservation of hygiene and safety of food applies to transport and storage.
- The norms of the International Standards Organisation (ISO) contain a chapter on the storage and delivery of food products.
- The Codex Alimentarius established in 1962 by the World Health Organisation (WHO) and the Food and Agriculture Organisation (FAO) includes the issues of transport and storage in the overall recommendations for the preservation of food.

### G.1.3 Food Manufacturing

According to the EU and consumers alike, **it is the food processing industry responsibility to meet consumer expectations that their products are safe, and meet all legal requirements.**

**Food processors rely on modern quality management systems to ensure the quality and safety of the products they produce.** The three key systems in use are:

- Good Manufacturing Practices (GMP). These entail the processing conditions and procedures that have been proven to deliver consistent quality and safety based on long experience.
- Hazard Analysis Critical Control Points (HACCP). While traditional safety assurance programmes focused on identifying problems in the finished product, HACCP, a recent proactive technique, focuses on identifying potential problems and controlling them during the design and the production process itself.
- Quality Assurance Standards. Adherence to standards established by the International Standards Organisation (ISO 9000) and the European Standard (EN 29000) ensures that food processing, catering and other food-related industries conform to prescribed and well-documented procedures. The effectiveness of these programmes is regularly assessed by independent experts.

**These same quality management systems used by food processors also involve working with the suppliers (individual farmers and raw material wholesalers), transporters, product wholesalers and retailers to ensure**

### **quality assurance procedures at each level.**

From the manufacturer to the consumer: Protecting Food through packaging

After the product is processed, food packaging ensures that food reaches the consumer in peak condition. Packaging preserves the integrity, safety and quality of food products in transport, wholesale warehouses, and retail stores and in the home. It helps maximise the shelf life of the product while carrying important information on the label. Besides, bar codes on packaging containing the date and the location of manufacture enables processors, transporters and retailers to keep track of products for both inventory control and identification of potential hazards.

#### G.1.4 The Consumer's Role in Safety Practices

**The consumer is the final element of the food chain.** Food that has been perfectly safe at the point of purchase needs to be handled carefully to avoid contamination at home. To ensure that eating remains an enjoyable experience and is not spoiled by the risks of falling ill or the fear, a number of measures can be taken.

#### **Purchase and transport**

- Always check the "Use-By" date or "Best before" date marking on packaged foods.
- Do not purchase products marked as "Keep refrigerated", "Keep chilled" or "Keep frozen" that have not been stored under adequate refrigeration.
- Take food that needs refrigeration home quickly and place it in the refrigerator or freezer promptly. Check the condition of frozen products. If thawed, do not refreeze.
- Make sure the packaging on foods is not damaged. Avoid dented and bloated cans, torn or warped packaging and damaged safety seals.

#### **Storage**

- Avoid contact between raw and cooked foods. This reduces the risk of

cross contamination (bacteria passing from one food to another). Store raw meats, poultry and fish near the bottom of the refrigerator and cooked foods on higher shelves. Do not put hot food in the refrigerator, as it will cause the temperature to rise. Store foods wrapped or in covered containers in the refrigerator. Discard foods that have gone mouldy or look, taste or smell bad.

- Store canned foods in a clean, cool dry place.

### **Food Preparation**

- Always wash your hands in hot, soapy water before and after handling food. Cover any cuts or sores with waterproof plasters.
- Keep all kitchen surfaces clean by washing with hot soapy water and disinfectant to prevent cross-contamination.
- Wash utensils and boards used in the preparation of foods. A knife used to cut raw foods may have bacteria on it, which can be transferred to other foods. Use separate cutting boards and utensils for raw and cooked foods.
- Wash raw fruit and vegetables thoroughly before eating and further preparation.
- Thaw frozen food in the refrigerator and cook it immediately it has thawed.
- Do not leave raw food that is likely to become contaminated or cooked food at room temperature longer than necessary, and never for more than two hours.
- Cool cooked foods as quickly as possible (preferably in large shallow pans) then refrigerate. This slows down the growth of bacteria, which occurs best at temperatures between 10 and 60 degrees Celsius (the "danger zone"). Reheat cooked foods thoroughly to kill any bacteria, which may have developed during storage.
- Play it safe. If you are not sure about a food's safety, throw it out rather than risk foodborne illness.

Always follow manufacturers recommended instructions.

### G.1.5 Food Contamination

This section G.1.5 was made available from the internet sources: [www.ecobuy.org.au](http://www.ecobuy.org.au) & [www.grubbsurvey.com](http://www.grubbsurvey.com) .

The potential for food to become contaminated with chemical substances or microorganisms starts from the time it is harvested and continues right through until the time it is eaten. In general, the risks to food safety fall into two broad categories:

- **Microbiological contamination** (eg: bacteria, fungi, viruses or parasites). This category results in most cases in acute symptoms.
- **Chemical contamination**, comprising of environmental chemicals, veterinary drug residues, heavy metals or other residues unintentionally or accidentally introduced into the food supply during farming, processing, shipping or packing.

Whether a contaminant will pose a health hazard or not depends on many factors including the absorption and toxicity of the substance, the level of the contaminant present in the food, the amount of contaminated food that is consumed and the duration of exposure. Besides, individuals differ in their sensitivity to contaminants and other factors in the diet can have an impact on the contaminant's toxic consequences. A further complicating factor concerning chemical contaminants is that many of the studies on the toxicity of contaminants must, by necessity, be extrapolated from animal studies and whether or not the substances exert the same effects in humans is not always known with absolute certainty.

#### G.1.5.1 Microbiological Contamination

The most reported causes of foodborne illnesses are of microbiological origin. Microbes are ubiquitous and can enter the food chain at any point from the agriculture produce to the consumer's kitchen. Quality assurance systems are designed to minimize the risk of microbiological contamination. However, as most of our food is not sterile, if handled improperly contamination may occur.

## G.1.5.1.1 Microorganisms and Foodborne Illness

The table G.1 below lists the microorganisms most commonly associated with foodborne illness and examples of foods that are typical vehicles for those illnesses.

CAUSE	FOODS MOST OFTEN ASSOCIATED WITH THE PROBLEM
<b>BACTERIA</b>	
Bacillus cereus	<b>Reheated</b> cooked rice, cooked meats, starchy puddings, vegetables and fish. <b>Improper handling</b> after cooking is a common feature of foods causing B. cereus associated foodborne illness.
Clostridium perfringens	<b>Reheated</b> foods including buffet dishes, cooked meat and poultry, beans, gravy, stews and soups.
Clostridium botulinum	<b>Improperly canned</b> (home preserved) foods such as vegetables, fish, meat and poultry.
Escherichia coli (E.coli)	Salads and raw vegetables, <b>undercooked</b> meat, cheese, unpasteurised milk.
Campylobacter jejuni	<b>Raw</b> milk, poultry
Listeria monocytogenes	<b>Unpasteurised</b> milk and milk products such as soft cheeses, raw meat, poultry, seafood, vegetables, paté, smoked meat and fish, coleslaw.
Salmonella	<b>Undercooked</b> poultry, meat, shellfish, salads, eggs

	and dairy products.
Staphylococcus aureus	Ham, poultry, eggs, ice-cream, cheese, salads, custard and cream-filled pastries and gravies, are the most common sources. <b>Improper handling</b> of food or poor hygiene could help S.aureus spread into food.
Vibrio parahaemolyticus and other marine Vibrio	<b>Raw and undercooked</b> fish and shellfish.
<b>PARASITES</b>	
Trichinella spiralis	<b>Undercooked</b> pork or game.
Toxoplasma gondii	<b>Undercooked</b> meat and poultry and raw milk.
<b>VIRUSES</b>	
Hepatitis A virus	Shellfish, <b>raw</b> fruits and vegetables can be the uncommon cause of hepatitis A. Hepatitis A can be spread by contaminated food handlers inadvertently transferring the virus to the food they handle.

**Table G.1 : Microorganisms most commonly associated with foodborne illness. Source:** Richard LACROIX (2014).

### **A) Mycotoxins**

Mycotoxins are toxins produced by certain fungi or moulds that grow on foods such as peanuts, tree nuts, corn, cereals, soybeans, animal feeds, dried fruits and spices. The toxins may be produced as crops grow or develop later during



poor storage or handling. Mycotoxins can also enter the food chain via meat or other animal products such as eggs, milk and cheese as the result of livestock eating contaminated feed.

The actual effects they have on health depend on the amount and type of the mycotoxins ingested. For instance continuous intake of aflatoxin is thought to be associated with liver cancer in people affected by Hepatitis B. Other mycotoxins have been linked to kidney and liver damage. **Careful surveillance procedures and proper storage conditions of foods are important in helping to prevent the development of mycotoxins.** In terms of protecting the consumer, National and International Organisations are constantly evaluating the risk that mycotoxins pose to humans.

#### G.1.5.2 Chemical Contamination

There are four common causes of chemical contamination – namely

- A) Pesticides
- B) Antibiotics and growth promoters (hormones)
- C) Industrial pollution (Dioxins & Heavy Metals)
- D) Bovine spongiform encephalopathy (BSE)

#### ***Pesticides***

An important priority for farmers is to ensure that their products - whether vegetable or animal in origin - are produced in a safe manner. To comply with this, they are assisted by a wide variety of farm advisory services, providing advice on the correct use of fertilisers, pesticides and other products in crop and animal husbandry.

Chemicals such as pesticides or products used in animal health are subject to strict regulations. They undergo rigid testing procedures before they are accepted for registration by European or national authorities. This testing must prove that the product, at the intended level of use:

Has real value and will work as intended will have no negative side effects in humans, either during use on the farm or from residues that may remain in

food will have no negative environmental effects More than 800 pesticides are currently approved for use in Europe. The procedure for establishing if a new product merits registration is complex. It requires many toxicity and efficacy studies before initial field tests can be carried out. It also includes tests on the degradation of the product and its derivatives in the plant and in the environment. A product should benefit the plant or animal it is intended to help with no negative effect on other species, and should not leave any harmful residues in the plant or animal or in the soil or water. To know more about pesticides.

### ***Antibiotics and growth promoters (hormones)***

The use of antibiotics and growth hormones in livestock has been a controversial matter for many years. The use of antibiotics in livestock farming is essential to help prevent the widespread and devastating effects of diseases in herds. In some cases, antibiotics have been added to feed to promote growth. It has been shown that low residues of the drugs may build up in the fatty tissue, kidneys and liver of animals however these are not thought to pose any risk to human health.

The use of antibiotics in livestock has been suspected as one of the causes of the emergence of antibiotic-resistant species of bacteria, although the most common cause is poor drug management in the treatment of human health. This in turn results in human illnesses that cannot be treated by traditional antibiotics. In March 2002, the EU proposed that the use of antibiotics as growth-promoting agents should be phased out by 2006.

Hormones have been fed to cattle to boost their growth rate and to increase milk production in cows. The EU banned the use of growth hormones in livestock in 1988, however, the practice still continues in the US, Canada and in Australia. The topic remains controversial especially in terms of international trade of hormone-treated beef. The UK is one of our surveyed countries which imports food products, mainly meats from New-Zealand, Australia and Canada which are resold as "European" to unsuspecting EU customers in Belgium and

elsewhere.

### ***Industrial pollution (Dioxins & Heavy Metals)***

#### **Dioxins**

Dioxins are by-products of the manufacture of certain industrial chemicals and incineration or burning. Dioxins are environmental contaminants that persist in the environment for many years and can find their way onto and into foods. In fish, polluted water is the main cause of dioxin contamination while animals are mostly exposed to dioxins through the air. Dioxins settle on plants and feed, which are then eaten by animals. Dioxin concentrates in the fatty tissues of livestock and fish. More than 90% of human exposure occurs mainly through foodstuffs. Those of animal origin normally account for approximate 80% of the overall exposure.

Despite punctual incidents (e.g. Belgium, 1999), available data shows that the background exposure to dioxin of the European population has decreased over the last 10 years. The current EU policy on dioxins aims at further reducing the contamination levels of dioxins in the environment, feed and foodstuffs in order to ensure a higher level of public health protection. Based on the knowledge that carcinogenic effects of dioxins do not occur at levels below a certain threshold, the overall goal is to reduce dioxin levels in products and hence human exposure by about 25% by 2006.

#### **Heavy metals**

Other industrial pollutants include heavy metals such as mercury, lead and cadmium. Fish are especially vulnerable to environmental pollutants because waters can become contaminated from industrial discharges or accidental spillage. Recent reports of levels of mercury in large predatory fish such as swordfish have caused some European authorities to issue warnings that these fish should not be eaten by pregnant or lactating women or children due to the possibility of high levels of mercury. Occasional intake by other consumers is not likely to pose a problem however intake should be limited to once a week. The fishing industry has responded by harvesting smaller sized

deep-sea fish, which are unlikely to have a build-up of heavy metals. The EU has standards for mercury and other heavy metal contaminants in foods and the levels are routinely monitored.

### ***Bovine spongiform encephalopathy (BSE)***

Bovine Spongiform Encephalopathy (BSE), commonly known as "mad cow disease", is a fatal brain disease that affects cattle. The disease is named after the characteristic sponge-like changes to the brain that it causes. There are different theories regarding the cause of BSE as well as the agent of the disease. According to one theory, the agent consists of "transmissible prions". "Prion" is actually a generic term for various proteins found mostly in the brain, but also in many other tissues, of humans and animals. Transmissible prions are abnormal prions that are capable of interacting with the normal prions in the tissues of animals to induce their conversion to transmissible prions, mostly in the brain and central nervous system. A number of other factors are thought to be involved in the development of BSE and research in this area is continuing.

The route of transmission of BSE is still not proven. However, it is thought that cattle may have become infected with BSE when fed bone meal or animal feed produced from the BSE-infected carcasses of dead or slaughtered animals. Other possible routes and causes of transmission have still not been ruled out.

Although no causal link has been formally established between ingestion of BSE-infected material and vCJD, only those who have eaten BSE-infected "specified risk material" (SRM) are thought to be at risk from vCJD. SRM refers to the parts of cattle that are most likely to be infected with the BSE agent and include the central nervous system including the brain, the spinal cord, the eye and part of the large intestine. The BSE agent has not been detected in muscle meat (beef) or milk and WHO and EU experts regard bovine milk and muscle meat to be safe.

Strict regulations to govern animal feeding, testing, slaughter, the age of cattle slaughtered for human consumption and removal of SRM are in place. The incidence of BSE in cattle in the UK, although still of concern, has fallen

significantly over recent years and BSE cases in mainland Europe remain low. The risk of contracting v-CJD from food is now believed to be very low. To know more about BSE.

#### G.1.6 Conclusions

Food safety is only ensured by the shared responsibility of everybody involved with food from the professional to the consumer. All along the food chain, various procedures and control mechanisms are implemented to assure that the food which reaches the consumer's table is fit for consumption, that the risks of contamination are minimised, so that the population as a whole is healthier from the benefits of safe quality food. However, zero risk within food does not exist and we have to be also aware that the best legislation and control systems cannot fully protect us against those with criminal intentions.

While food safety is covered by the EU recommendations the subject of food Quality is assumed – yet – the lack of quality can be the cause food poisoning and contamination. Let us discuss briefly some circumstances in order to link this section with the next (2.2 ISO standards) which addresses the most common of these standards (9000, 22000) and environmental management systems (14001 & EMAS).

**Food quality is the quality characteristics of food that is acceptable to consumers.** This includes external factors as appearance (size, shape, color, gloss, and consistency), texture, and flavor; factors such as federal grade standards (e.g. of eggs) and internal (chemical, physical, microbial).[[http://en.wikipedia.org/wiki/Food\\_quality](http://en.wikipedia.org/wiki/Food_quality)]

Food quality is an important food manufacturing requirement, because food consumers are susceptible to any form of contamination that may occur during the manufacturing process. Many consumers also rely on manufacturing and processing standards, particularly to know what ingredients are present, due to dietary, nutritional requirements (kosher,halal, vegetarian), or medical conditions (e.g., diabetes, or allergies).

Besides ingredient quality, there are also sanitation requirements. It is important to ensure that the food processing environment is as clean as

possible in order to produce the safest possible food for the consumer. A recent example of poor sanitation recently outside of Europe has been the 2006 North American E. coli outbreak involving spinach, an outbreak that is still under investigation in 2015 after new information has come to light regarding the involvement of Cambodian nationals.

Food quality also deals with product traceability, (e.g., of ingredient, and packaging suppliers), should a recall of the product be required. It also deals with labeling issues to ensure there is correct ingredient and nutritional information.

There are many existing international quality institutes testing food products in order to indicate to all consumers which are higher quality products. Founded in 1961 in Brussels, The international quality institute Monde Selection is the oldest one [1] in evaluating food quality. [2] During the degustation, the products must meet the following selection criteria, required by the Institute: sensory analysis, bacteriological and chemical analysis, the nutrition and health claims, and the utilization notice. In short, the judgments are based on the following areas: taste, health, convenience, labelling, packaging, environmental friendliness and innovation.[3] As many consumers rely on manufacturing and processing standards, the Institute Monde Selection takes into account the European Food Law.[3]

## **G.2 HACCP, ISO Standards (9000, 22000, 14001) & EMAS**

“In many products and services, quality standards are set by Health & Safety legislation and enforced by Trading Standards officers. This is especially important in areas such as catering, food, health and for any product that might pose risks to users if the quality was poor. Other relevant legislation would include food labelling and weights and measures, which aim to ensure that the product is as described, contains the correct quantity, and to include correct information about ingredients. Some examination specifications may require a more detailed understanding of relevant legislation, as part of the study of external influences on business ([www.tutor.net](http://www.tutor.net))

Because food safety does not address the risks associated with a “lack of quality” some companies implement ISO quality standards such as ISO 9000

and ISO 22000 to go beyond HACCP limitations & some of the leading best practitioners also implement the international environmental management system known as ISO 14001 or choose the European equivalent known as “EMAS”. Before we go down to the specifics let us mention a few words about the ISO organization. “ISO (International Organization for Standardization) is the world's largest developer and publisher of International Standards. ISO is a network of the national standards institutes of 163 countries, one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system. ISO is a non-governmental organization that forms a bridge between the public and private sectors. On the one hand, many of its member institutes are part of the governmental structure of their countries, or are mandated by their government. On the other hand, other members have their roots uniquely in the private sector, having been set up by national partnerships of industry associations. Therefore, ISO enables a consensus to be reached on solutions that meet both the requirements of business and the broader needs of society” ([www.kascert.com](http://www.kascert.com)). According to another internet source: “ISO Standards cover a wide variety of items ranging from Food and Beverage to medical equipment to shipbuilding. ISO Standards cover: Mechanical, Machinery, Chemistry, Coatings, Construction, Metals, Aerospace, Fuels, Energy, Transportation, Information, Image Technology, Quality, Measurements, Safety, Environment, Medical, and Consumer Goods” ([www.engineers.ihs.com](http://www.engineers.ihs.com)) .

#### G.2.1 HACCP, ISO 9000 & ISO 22000

##### **HACCP**



**Figure G1: HACCP Logo** Source : [<http://www.whatishaccp.com/what-is-haccp>]

This section is taken from the internet source whatishaccp: “HACCP stands for – Hazard Analysis Critical Control Point In short, HACCP system which includes a series of procedures to control the process and sensitive points in the food chain, with the ultimate goal of consumer foods used in the state and in a way that is safe for his health. HACCP – the system from the seventies of the twentieth century became recognized as an international standard for safe food production. Also, the World Health Organization (WHO) has adopted it as the most effective means for controlling foodborne diseases. Application HACCP system is one of the basic requirements for the export of our products and conquering the European market ([www.whatishaccp.com](http://www.whatishaccp.com)) .

### The seven HACCP principles

1. The implementation of hazard analysis / risk, identify hazards / risks that may arise in the process of food production.
2. Determination of critical control points (CCP). For each identified risk must exist at least one appropriate and critical control point whose existence enables high-quality identification of possible risks.
3. Determination of critical limits, maximal and / or minimum value, by which the biological, chemical and physical hazards are controlled in order of prevention. If so, critical limits are adjusted to the requirements of regulations or law.



4. Determination of procedures / processes for monitoring the CCP, with which to ensure that the CCP remains in critical limits. Monitoring of critical limits, is the answers to the questions: what, how, how often and by whom.

5. Determination of corrective measures if monitoring shows that the CCP is not within critical limits. Corrective measures to ensure that the cause of the problem is identified and eliminated.

6. Establishing procedures / processes for verification and certification procedures and the HACCP system is effective and works well. The authorized persons employed in manufacturing, HACCP team and the inspection of the facility should be also included in the verification activities.

7. The establishment and effective management of records and documents, and documenting evidence that the HACCP system is working well.

#### Which industries are required to apply HACCP ?

HACCP is applicable at all stages of production of one item.

All who come into contact with the product at any stage of his treatment, processing or distribution must apply the principles of HACCP.

Industries which are required to apply HACCP are:

- Production, processing and packaging
- Storage, transport and distribution
- Preparation and distribution of food – for hospitals, hotels, restaurants, airlines and other companies
- Shop – retail and catering
- Food & Beverage Industry.

#### What are the advantages of HACCP?

HACCP is a very effective since it prevents the occurrence of incidents at the cost of unnecessary waste. Also, the HACCP system protects the manufacturer from potential negative publicity. Eventually consumer claims, justified and unjustified, can be easily disproved by applying the effective program for food security, fully documented in the form of a well-maintained HACCP records. HACCP certification process is similar for all other certification schemes.

### HACCP Certification Process

This process is divided into five steps:

1. Preparation of HACCP
2. Making the study and development of HACCP-system
3. The implementation of HACCP-system
4. Certification of HACCP – system of the international certification body
5. Maintaining and monitoring the HACCP system

### **ISO 9000**

This section is taken from the [www.en.wikipedia.org](http://www.en.wikipedia.org): The ISO 9000 family of quality management systems standards is designed to help organizations ensure that they meet the needs of customers and other stakeholders while meeting statutory and regulatory requirements related to a product.[1] ISO 9000 deals with the fundamentals of quality management systems,[2] including the eight management principles upon which the family of standards is based.[2][3] ISO 9001 deals with the requirements that organizations wishing to meet the standard must fulfill.[4] Third-party certification bodies provide independent confirmation that organizations meet the requirements of ISO 9001. Over one million organizations worldwide [5] are independently certified, making ISO 9001 one of the most widely used management tools in the world today. Despite widespread use, the ISO certification process has been criticized [6] [7] as being wasteful and not being useful for all organizations. [8][9].

### **Evolution of ISO 9000 Standards**

The ISO 9000 standard is continually being revised by standing technical committees and advisory groups, who receive feedback from those professionals who are implementing the standard.

### 1987 version

ISO 9000:1987 had the same structure as the UK Standard BS 5750, with three "models" for quality management systems, the selection of which was based on the scope of activities of the organization:

- ISO 9001:1987 Model for quality assurance in design, development, production, installation, and servicing was for companies and organizations whose activities included the creation of new products.
- ISO 9002:1987 Model for quality assurance in production, installation, and servicing had basically the same material as ISO 9001 but without covering the creation of new products.
- ISO 9003:1987 Model for quality assurance in final inspection and test covered only the final inspection of finished product, with no concern for how the product was produced.

ISO 9000:1987 was also influenced by existing U.S. and other Defense Standards ("MIL SPECS"), and so was well-suited to manufacturing. The emphasis tended to be placed on conformance with procedures rather than the overall process of management, which was likely the actual intent.

### 1994 version

ISO 9000:1994 emphasized quality assurance via preventive actions, instead of just checking final product, and continued to require evidence of compliance with documented procedures. As with the first edition, the down-side was that companies tended to implement its requirements by creating shelf-loads of procedure manuals, and becoming burdened with an ISO bureaucracy. In some companies, adapting and improving processes could actually be impeded by the quality system.

### 2000 version

ISO 9001:2000 replaced all three former standards of 1994 issue, ISO 9001, ISO 9002 and ISO 9003. Design and development procedures were required

only if a company does in fact engage in the creation of new products. The 2000 version sought to make a radical change in thinking by actually placing the concept of process management front and center ("Process management" was the monitoring and optimisation of a company's tasks and activities, instead of just inspection of the final product). The 2000 version also demanded involvement by upper executives in order to integrate quality into the business system and avoid delegation of quality functions to junior administrators. Another goal was to improve effectiveness via process performance metrics: numerical measurement of the effectiveness of tasks and activities. Expectations of continual process improvement and tracking customer satisfaction were made explicit.

ISO 9000 Requirements include:

- Approve documents before distribution;
- Provide correct version of documents at points of use;
- Use your records to prove that requirements have been met; and
- Develop a procedure to control your records.

### 2008 version

ISO 9001:2008 in essence re-narrates ISO 9001:2000. The 2008 version only introduced clarifications to the existing requirements of ISO 9001:2000 and some changes intended to improve consistency with ISO 14001:2004. There were no new requirements. For example, in ISO 9001:2008, a quality management system being upgraded just needs to be checked to see if it is following the clarifications introduced in the amended version.

ISO 9001 is supplemented directly by two other standards of the family:

- ISO 9000:2005 "Quality management systems. Fundamentals and vocabulary"
- ISO 9004:2009 "Managing for the sustained success of an organization. A quality management approach"

Other standards, like ISO 19011 and the ISO 10000 series, may also be used for specific parts of the quality system.

#### Forthcoming 2015 version

Since 2012, the current standard has been under revision. A next version is expected to be published in December 2015 and will replace the current version, if the ISO members vote favourably in March 2015. [29]

With the revision the scope of the standard will not change. An essential change, however, will affect the structure. The new ISO 9001:2015 will follow the so-called high-level structure. This, and the uniform use of core texts and terms, will enable an identical structure for all management systems.

On the basis of ISO/DIS 9001 published in May 2014, the process-oriented approach is maintained within the standard and includes topics such as risk management, change management and knowledge management. [http://en.wikipedia.org/wiki/ISO\_9000]

#### **ISO 22000**

This section is available thanks to the contribution of the internet source [www.cmcq.com.cn](http://www.cmcq.com.cn) :

This International Standard specifies requirements for a food safety management system where an organization in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption. It is applicable to all organizations, regardless of size, which are involved in any aspect of the food chain and want to implement systems that consistently provide safe products. The means of meeting any requirements of this International Standard can be accomplished through the use of internal and/or external resources.

This International Standard specifies requirements to allow an organization to :

a) Plan, implement, operate, maintain and update a food safety management system aimed at providing products that, according to their intended use, are

safe for the consumer,

- b) Demonstrate compliance with applicable statutory and regulatory food safety requirements,
- c) Evaluate and assess customer requirements and demonstrate conformity with those mutually agreed customer requirements that relate to food safety, in order to enhance customer satisfaction,
- d) Communicate effectively food safety issues to their suppliers, customers and relevant interested parties in the food chain,
- e) Ensure that the organization conforms to its stated food safety policy,
- f) Demonstrate such conformity to relevant interested parties, and
- g) Seek certification or registration of its food safety management system by an external organization, or make a self-assessment or self-declaration of conformity to this International Standard.

All requirements of this International Standard are generic and are intended to be applicable to all organizations in the food chain regardless of size and complexity. This includes organizations directly or indirectly involved in one or more steps of the food chain. Organizations that are directly involved include, but are not limited to, feed producers, harvesters, farmers, producers of ingredients, food manufacturers, retailers, food services, catering services, organizations providing cleaning and sanitation services, transportation, storage and distribution services. Other organizations that are indirectly involved include, but are not limited to, suppliers of equipment, cleaning and sanitizing agents, packaging material, and other food contact materials.

This International Standard allows an organization, such as a small and/or less developed organization (e.g. a small farm, a small packer-distributor, a small retail or food service outlet), to implement an externally developed combination of control measures.

NOTE Guidance on the application of this International Standard is given in ISO/TS 22004.

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## G.2.2 ISO 14001



**Figure G.2** The ISO 14001 logo

SOURCE: ISO 14001, <https://.../Image/environment/ISO14001.jpg>

The ISO 14001 [Figure G.2] was first published in 1996 and specifies the actual requirements for an environmental management system. It applies to many environmental cases are under control and under the influence of the Agency. Often reported as the main standard series ISO 14000. Not only the best known, but the only standard ISO 14000 can be certified by an external certification authority. Thus not only from the specific environmental performance criteria. This standard is applicable to any organization that wishes:

- Integration, maintain and improve an environmental management system.
- Ensure compliance with the stated environmental policy (commitment to be fulfilled).
- Declaration of Conformity.
- Ensure compliance with environmental laws and regulations.
- Search certification of environmental management system by an external, independent body.
- Self-compliance with this standard.

## G.2.3 EMAS

**Eco-Management and Audit Scheme/EMAS** [Figure G.3] is a management tool for companies and other organizations, whose mission is to evaluate, report and improve their environmental performance. The figure was available for participation by companies in 1995 (Council Regulation (EEC) No

1836/93 of 29 June 1993) and was initially limited to the industrial sector companies . Since 2001 EMAS is open to all economic sectors, including public and by private services (Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001). In addition, EMAS was strengthened by the incorporation of EN / ISO 14001 on environmental management system required by the same (EMAS), the adoption of an attractive logo and including and indirect effects, such as those related to financial services or administrative and planning decisions.



**Figure G.3** The EMAS logo - SOURCE:

<http://en.life-promise.org/var/plain/storage/images/media/images/emas>

Participation is voluntary and extends to public and private sector in the EU and the EEA (European Economic Area / EEA) -Iceland, Liechtenstein and Norway [Infocentre 2006, pp.12-13]. Figure increasingly using increasing number of Member States.

To be registered under EMAS an operator must comply with the following:

The implementation of environmental control in all environmental aspects of its activities, products and services of the organization, their methods of evaluation, the institutional framework and the statutes, and the existing environmental management practices and procedures.

In view of the results of the audit, establish an environmental management system, aimed at the implementation of environmental policy as defined by Senior Management. The management system requires the position responsibilities, objectives, means, operational procedures, training needs, monitoring and communication systems, etc.



Completion of environmental control to evaluate mainly the applied management system and compliance with the policy and programs of the organization as well as compliance with environmental regulatory requirements.

Statement of grant of environmental performance, which records the results against its environmental objectives and future steps to continuously improving environmental performance of the organization.

The environmental audit, EMS, the audit procedure and the environmental statement must be approved by an accredited EMAS verification system and a valid certificate must be sent to the competent body for EMAS registration and made public before an organization uses the logo.

## Conclusion

Exploring the institutional framework, policies and EU initiatives is of particular importance as they become a part of or complement or improve the respective national member countries, while acting as key guidelines and benchmarks for the integration of the implementation of green procurement in the practices and procedures of organizations. Analysis of important decisions, the need for clarification and interpretation in order to perfect the seamless implementation, and the reference to the most recent guidelines for the integration of environmental parameters in public procurement, explaining the main features and provisions in the use of environmental requirements in relation to the goods, services and construction sectors. (Limits, transparency, production processes, eco-labeling, environmental management systems, RFP bidders' exceptions in the tender process, selection criteria, etc.).

The institution of eco-labeling acts as a guarantee of eco-friendly- of " green " particularities and is used in products and services with established representative signals (The flower - symbol of the EU eco-label, the Blue Angel, the Nordic Swan etc.) who find application within the EU and internationally. Finally, the reference to environmental management systems aimed at analyzing the contents of Figure Eco-Management and Audit (EMAS)

and ISO 14001 as instruments and quality assurance tools and compliance with environmentally friendly legislation in companies and other organizations.

### G.3 Risk Management

This section is available thanks to the contribution of the internet source

[www.elearning.sbta.com.au](http://www.elearning.sbta.com.au) :

ISO 31000 is a family of standards relating to risk management codified by the International Organization for Standardization. The purpose of ISO 31000:2009 is to provide principles and generic guidelines on risk management. ISO 31000 seeks to provide a universally recognised paradigm for practitioners and companies employing risk management processes to replace the myriad of existing standards, methodologies and paradigms that differed between industries, subject matters and regions. Currently, the ISO 31000 family includes:

- ISO 31000:2009 - Principles and Guidelines on Implementation [1]
- ISO/IEC 31010:2009 - Risk Management - Risk Assessment Techniques
- ISO Guide 73:2009 - Risk Management - Vocabulary

ISO also designed its ISO 21500 Guidance on Project Management standard to align with ISO 31000:2009. [2]

Risk management according to wikipedia is the identification, assessment, and prioritization of risks (defined in ISO 31000 as the effect of uncertainty on objectives) followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events [1] or to maximize the realization of opportunities [[http://en.wikipedia.org/wiki/Risk\\_management](http://en.wikipedia.org/wiki/Risk_management)].

Risks can come from uncertainty in financial markets, threats from project failures (at any phase in design, development, production, or sustainment life-cycles), legal liabilities, credit risk, accidents, natural causes and disasters as well as deliberate attack from an adversary, or events of uncertain or unpredictable root-cause. Several risk management standards have been developed including the Project Management Institute, the National Institute of

Standards and Technology, actuarial societies, and ISO standards.[2][3]  
Methods, definitions and goals vary widely according to whether the risk management method is in the context of project management, security, engineering, industrial processes, financial portfolios, actuarial assessments, or public health and safety.

The strategies to manage threats (uncertainties with negative consequences) typically include transferring the threat to another party, avoiding the threat, reducing the negative effect or probability of the threat, or even accepting some or all of the potential or actual consequences of a particular threat, and the opposites for opportunities (uncertain future states with benefits). Certain aspects of many of the risk management standards have come under criticism for having no measurable improvement on risk, whether the confidence in estimates and decisions seem to increase.[1] For example, it has been shown that one in six IT projects experience cost overruns of 200% on average, and schedule overruns of 70%.[4]

### **Risk Management Vocabulary ISO Guide 73**

A widely used vocabulary for risk management is defined by ISO Guide 73, "Risk management. Vocabulary." [2]

In ideal risk management, a prioritization process is followed whereby the risks with the greatest loss (or impact) and the greatest probability of occurring are handled first, and risks with lower probability of occurrence and lower loss are handled in descending order. In practice the process of assessing overall risk can be difficult, and balancing resources used to mitigate between risks with a high probability of occurrence but lower loss versus a risk with high loss but lower probability of occurrence can often be mishandled.

Intangible risk management identifies a new type of a risk that has a 100% probability of occurring but is ignored by the organization due to a lack of identification ability. For example, when deficient knowledge is applied to a situation, a knowledge risk materializes. Relationship risk appears when ineffective collaboration occurs. Process-engagement risk may be an issue when ineffective operational procedures are applied. These risks directly reduce the productivity of knowledge workers, decrease cost-effectiveness,

profitability, service, quality, reputation, brand value, and earnings quality. Intangible risk management allows risk management to create immediate value from the identification and reduction of risks that reduce productivity.

Risk management also faces difficulties in allocating resources. This is the idea of opportunity cost. Resources spent on risk management could have been spent on more profitable activities. Again, ideal risk management minimizes spending (or manpower or other resources) and also minimizes the negative effects of risks.

### **Risk Management Method**

For the most part, these methods consist of the following elements, performed, more or less, in the following order :

- identify, characterize threats
- assess the vulnerability of critical assets to specific threats
- determine the risk (i.e. the expected likelihood and consequences of specific types of attacks on specific assets)
- identify ways to reduce those risks
- prioritize risk reduction measures based on a strategy

### **Principles of Risk Management**

The International Organization for Standardization (ISO) identifies the following principles of risk management:[5] - Risk management should:

- create value – resources expended to mitigate risk should be less than the consequence of inaction, or (as in value engineering), the gain should exceed the pain
- be an integral part of organizational processes
- be part of decision making process
- explicitly address uncertainty and assumptions
- be systematic and structured process
- be based on the best available information

- be tailorable
- take human factors into account
- be transparent and inclusive
- be dynamic, iterative and responsive to change
- be capable of continual improvement and enhancement
- be continually or periodically re-assessed

### Risk Management Process

According to the standard ISO 31000 "Risk management – Principles and guidelines on implementation,"[3] the process of risk management consists of several steps as follows: This involves:

identification of risk in a selected domain of interest

planning the remainder of the process

mapping out the following:

the social scope of risk management

the identity and objectives of stakeholders

the basis upon which risks will be evaluated, constraints.

defining a framework for the activity and an agenda for identification

developing an analysis of risks involved in the process

mitigation or solution of risks using available technological, human and organizational resources.

### Risk Management Identification in detail

After establishing the context, the next step in the process of managing risk is to identify potential risks. Risks are about events that, when triggered, cause problems or benefits. Hence, risk identification can start with the source of our problems and those of our competitors (benefit), or with the problem itself.

- Source analysis- Risk sources may be internal or external to the system that is the target of risk management (use mitigation instead of management

since by its own definition risk deals with factors of decision-making that cannot be managed).

Examples of risk sources are: stakeholders of a project, employees of a company or the weather over an airport.

- Problem analysis - Risks are related to identified threats. For example: the threat of losing money, the threat of abuse of confidential information or the threat of human errors, accidents and casualties. The threats may exist with various entities, most important with shareholders, customers and legislative bodies such as the government.

When either source or problem is known, the events that a source may trigger or the events that can lead to a problem can be investigated. For example: stakeholders withdrawing during a project may endanger funding of the project; confidential information may be stolen by employees even within a closed network; lightning striking an aircraft during takeoff may make all people on board immediate casualties.

The chosen method of identifying risks may depend on culture, industry practice and compliance. The identification methods are formed by templates or the development of templates for identifying source, problem or event. Common risk identification methods are:

- Objectives-based risk identification - Organizations and project teams have objectives. Any event that may endanger achieving an objective partly or completely is identified as risk.
- Scenario-based risk identification - In scenario analysis different scenarios are created. The scenarios may be the alternative ways to achieve an objective, or an analysis of the interaction of forces in, for example, a market or battle. Any event that triggers an undesired scenario alternative is identified as risk – see Futures Studies for methodology used by Futurists.
- Taxonomy-based risk identification - The taxonomy in taxonomy-based risk identification is a breakdown of possible risk sources. Based on the taxonomy and knowledge of best practices, a questionnaire is compiled. The answers to the questions reveal risks. [6]

- Common-risk checking - In several industries, lists with known risks are available. Each risk in the list can be checked for application to a particular situation. [7]
- Risk charting [8] - This method combines the above approaches by listing resources at risk, threats to those resources, modifying factors which may increase or decrease the risk and consequences it is wished to avoid. Creating a matrix under these headings enables a variety of approaches. One can begin with resources and consider the threats they are exposed to and the consequences of each. Alternatively one can start with the threats and examine which resources they would affect, or one can begin with the consequences and determine which combination of threats and resources would be involved to bring them about.

#### Risk Assessment

Once risks have been identified, they must then be assessed as to their potential severity of impact (generally a negative impact, such as damage or loss) and to the probability of occurrence. These quantities can be either simple to measure, in the case of the value of a lost building, or impossible to know for sure in the case of the probability of an unlikely event occurring. Therefore, in the assessment process it is critical to make the best educated decisions in order to properly prioritize the implementation of the risk management plan.

Even a short-term positive improvement can have long-term negative impacts. Take the "turnpike" example. A highway is widened to allow more traffic. More traffic capacity leads to greater development in the areas surrounding the improved traffic capacity. Over time, traffic thereby increases to fill available capacity. Turnpikes thereby need to be expanded in a seemingly endless cycles. There are many other engineering examples where expanded capacity (to do any function) is soon filled by increased demand. Since expansion comes at a cost, the resulting growth could become unsustainable without forecasting and management.

The fundamental difficulty in risk assessment is determining the rate of occurrence since statistical information is not available on all kinds of past



incidents. Furthermore, evaluating the severity of the consequences (impact) is often quite difficult for intangible assets. Asset valuation is another question that needs to be addressed. Thus, best educated opinions and available statistics are the primary sources of information. Nevertheless, risk assessment should produce such information for the management of the organization that the primary risks are easy to understand and that the risk management decisions may be prioritized. Thus, there have been several theories and attempts to quantify risks. Numerous different risk formulae exist, but perhaps the most widely accepted formula for risk quantification is:

Rate (or probability) of occurrence multiplied by the impact of the event equals risk magnitude

#### Composite Risk Index

The above formula can also be re-written in terms of a Composite Risk Index, as follows:

Composite Risk Index = Impact of Risk event x Probability of Occurrence

#### Risk Options

Risk mitigation measures are usually formulated according to one or more of the following major risk options, which are:

1. Design a new business process with adequate built-in risk control and containment measures from the start.
2. Periodically re-assess risks that are accepted in ongoing processes as a normal feature of business operations and modify mitigation measures.
3. Transfer risks to an external agency (e.g. an insurance company)
4. Avoid risks altogether (e.g. by closing down a particular high-risk business area)

Later research has shown that the financial benefits of risk management are less dependent on the formula used but are more dependent on the frequency and how risk assessment is performed.

In business it is imperative to be able to present the findings of risk

assessments in financial, market, or schedule terms. Robert Courtney Jr. (IBM, 1970) proposed a formula for presenting risks in financial terms. The Courtney formula was accepted as the official risk analysis method for the US governmental agencies. The formula proposes calculation of ALE (annualised loss expectancy) and compares the expected loss value to the security control implementation costs (cost-benefit analysis).

#### Potential Risk Treatments

Once risks have been identified and assessed, all techniques to manage the risk fall into one or more of these four major categories:[9]

- Avoidance (eliminate, withdraw from or not become involved)
- Reduction (optimize – mitigate)
- Sharing (transfer – outsource or insure)
- Retention (accept and budget)

Ideal use of these strategies may not be possible. Some of them may involve trade-offs that are not acceptable to the organization or person making the risk management decisions. Another source, from the US Department of Defense (see link), Defense Acquisition University, calls these categories ACAT, for Avoid, Control, Accept, or Transfer. This use of the ACAT acronym is reminiscent of another ACAT (for Acquisition Category) used in US Defense industry procurements, in which Risk Management figures prominently in decision making and planning.

#### Risk Avoidance

This includes not performing an activity that could carry risk. An example would be not buying a property or business in order to not take on the legal liability that comes with it. Another would be not flying in order not to take the risk that the airplane were to be hijacked. Avoidance may seem the answer to all risks, but avoiding risks also means losing out on the potential gain that accepting (retaining) the risk may have allowed. Not entering a business to avoid the risk of loss also avoids the possibility of earning profits. Increasing risk regulation in hospitals has led to avoidance of treating higher risk conditions, in favour of

patients presenting with lower risk.[10]

### Hazard Prevention

Hazard prevention refers to the prevention of risks in an emergency. The first and most effective stage of hazard prevention is the elimination of hazards. If this takes too long, is too costly, or is otherwise impractical, the second stage is mitigation.

### Risk Reduction

Risk reduction or "optimization" involves reducing the severity of the loss or the likelihood of the loss from occurring. For example, sprinklers are designed to put out a fire to reduce the risk of loss by fire. This method may cause a greater loss by water damage and therefore may not be suitable. Halon fire suppression systems may mitigate that risk, but the cost may be prohibitive as a strategy.

Acknowledging that risks can be positive or negative, optimizing risks means finding a balance between negative risk and the benefit of the operation or activity; and between risk reduction and effort applied. By an offshore drilling contractor effectively applying HSE Management in its organization, it can optimize risk to achieve levels of residual risk that are tolerable. [11]

Modern software development methodologies reduce risk by developing and delivering software incrementally. Early methodologies suffered from the fact that they only delivered software in the final phase of development; any problems encountered in earlier phases meant costly rework and often jeopardized the whole project. By developing in iterations, software projects can limit effort wasted to a single iteration.

Outsourcing could be an example of risk reduction if the outsourcer can demonstrate higher capability at managing or reducing risks.[12] For example, a company may outsource only its software development, the manufacturing of hard goods, or customer support needs to another company, while handling

the business management itself. This way, the company can concentrate more on business development without having to worry as much about the manufacturing process, managing the development team, or finding a physical location for a call center.

### Risk Sharing

Briefly defined as "sharing with another party the burden of loss or the benefit of gain, from a risk, and the measures to reduce a risk."

The term of 'risk transfer' is often used in place of risk sharing in the mistaken belief that you can transfer a risk to a third party through insurance or outsourcing. In practice if the insurance company or contractor go bankrupt or end up in court, the original risk is likely to still revert to the first party. As such in the terminology of practitioners and scholars alike, the purchase of an insurance contract is often described as a "transfer of risk." However, technically speaking, the buyer of the contract generally retains legal responsibility for the losses "transferred", meaning that insurance may be described more accurately as a post-event compensatory mechanism. For example, a personal injuries insurance policy does not transfer the risk of a car accident to the insurance company. The risk still lies with the policy holder namely the person who has been in the accident. The insurance policy simply provides that if an accident (the event) occurs involving the policy holder then some compensation may be payable to the policy holder that is commensurate to the suffering/damage.

Some ways of managing risk fall into multiple categories. Risk retention pools are technically retaining the risk for the group, but spreading it over the whole group involves transfer among individual members of the group. This is different from traditional insurance, in that no premium is exchanged between members of the group up front, but instead losses are assessed to all members of the group.

### Risk Retention

Involves accepting the loss, or benefit of gain, from a risk when it occurs. True self insurance falls in this category. Risk retention is a viable strategy for

small risks where the cost of insuring against the risk would be greater over time than the total losses sustained. All risks that are not avoided or transferred are retained by default. This includes risks that are so large or catastrophic that they either cannot be insured against or the premiums would be infeasible. War is an example since most property and risks are not insured against war, so the loss attributed by war is retained by the insured. Also any amounts of potential loss (risk) over the amount insured is retained risk. This may also be acceptable if the chance of a very large loss is small or if the cost to insure for greater coverage amounts is so great it would hinder the goals of the organization too much.

### **Create a Risk Management Plan**

Select appropriate controls or countermeasures to measure each risk. Risk mitigation needs to be approved by the appropriate level of management. For instance, a risk concerning the image of the organization should have top management decision behind it whereas IT management would have the authority to decide on computer virus risks.

The risk management plan should propose applicable and effective security controls for managing the risks. For example, an observed high risk of computer viruses could be mitigated by acquiring and implementing antivirus software. A good risk management plan should contain a schedule for control implementation and responsible persons for those actions.

According to ISO/IEC 27001, the stage immediately after completion of the risk assessment phase consists of preparing a Risk Treatment Plan, which should document the decisions about how each of the identified risks should be handled. Mitigation of risks often means selection of security controls, which should be documented in a Statement of Applicability, which identifies which particular control objectives and controls from the standard have been selected, and why. Implementation follows all of the planned methods for mitigating the effect of the risks. Purchase insurance policies for the risks that have been decided to be transferred to an insurer, avoid all risks that can be avoided without sacrificing the entity's goals, reduce others, and retain the rest.

## Review and Evaluation of that Plan

Initial risk management plans will never be perfect. Practice, experience, and actual loss results will necessitate changes in the plan and contribute information to allow possible different decisions to be made in dealing with the risks being faced.

Risk analysis results and management plans should be updated periodically. There are two primary reasons for this:

1. to evaluate whether the previously selected security controls are still applicable and effective
2. to evaluate the possible risk level changes in the business environment. For example, information risks are a good example of rapidly changing business environment.

## Limitations of Risk Management Plan

Prioritizing the *risk management processes* too highly could keep an organization from ever completing a project or even getting started. This is especially true if other work is suspended until the risk management process is considered complete.

It is also important to keep in mind the distinction between risk and [uncertainty](#). Risk can be measured by impacts x probability.

If risks are improperly assessed and prioritized, time can be wasted in dealing with risk of losses that are not likely to occur. Spending too much time assessing and managing unlikely risks can divert resources that could be used more profitably. Unlikely events do occur but if the risk is unlikely enough to occur it may be better to simply retain the risk and deal with the result if the loss does in fact occur. Qualitative risk assessment is subjective and lacks consistency. The primary justification for a formal risk assessment process is legal and bureaucratic.

## Areas of Risk Management

As applied to corporate finance, risk management is the technique for

measuring, monitoring and controlling the financial or operational risk on a firm's balance sheet. See value at risk.

The Basel II framework breaks risks into market risk (price risk), credit risk and operational risk and also specifies methods for calculating capital requirements for each of these components.

In enterprise risk management, a risk is defined as a possible event or circumstance that can have negative influences on the enterprise in question. Its impact can be on the very existence, the resources (human and capital), the products and services, or the customers of the enterprise, as well as external impacts on society, markets, or the environment. In a financial institution, enterprise risk management is normally thought of as the combination of credit risk, interest rate risk or asset liability management, liquidity risk, market risk, and operational risk.

In the more general case, every probable risk can have a pre-formulated plan to deal with its possible consequences (to ensure contingency if the risk becomes a liability).

From the information above and the average cost per employee over time, or cost accrual ratio, a project manager can estimate:

- the cost associated with the risk if it arises, estimated by multiplying employee costs per unit time by the estimated time lost (cost impact,  $C$  where  $C = \text{cost accrual ratio} * S$ ).
- the probable increase in time associated with a risk (schedule variance due to risk,  $R_s$  where  $R_s = P * S$ ):
- Sorting on this value puts the highest risks to the schedule first. This is intended to cause the greatest risks to the project to be attempted first so that risk is minimized as quickly as possible.
- This is slightly misleading as schedule variances with a large  $P$  and small  $S$  and vice versa are not equivalent. (The risk of the RMS Titanic sinking vs. the passengers' meals being served at slightly the wrong time).
- the probable increase in cost associated with a risk (cost variance due

to risk,  $R_c$  where  $R_c = P \cdot C = P \cdot CAR \cdot S = P \cdot S \cdot CAR$ )

- sorting on this value puts the highest risks to the budget first.
- see concerns about schedule variance as this is a function of it, as illustrated in the equation above.

Risk in a project or process can be due either to Special Cause Variation or Common Cause Variation and requires appropriate treatment. That is to re-iterate the concern about extremal cases not being equivalent in the list immediately above.

### Positive Risk Management

Positive Risk Management is an approach that recognizes the importance of the human factor and of individual differences in propensity for risk taking. It draws from the work of a number of academics and professionals who have expressed concerns about scientific rigor of the wider risk management debate, [24] or who have made a contribution emphasizing the human dimension of risk. [25][26]

Firstly, it recognizes that any object or situation can be rendered hazardous by the involvement of someone with an inappropriate disposition towards risk; whether too risk taking or too risk averse.

Secondly, it recognizes that risk is an inevitable and ever present element throughout life: from conception through to the point at the end of life when we finally lose our personal battle with life-threatening risk.

Thirdly, it recognizes that every individual has a particular orientation towards risk; while at one extreme people may by nature be timid, anxious and fearful, others will be adventurous, impulsive and almost oblivious to danger. These differences are evident in the way we drive our cars, in our diets, in our relationships, in our careers.

Finally, Positive Risk Management recognizes that risk taking is essential to all enterprise, creativity, heroism, education, scientific advance – in fact to any activity and all the initiatives that have contributed to our evolutionary success and civilization. It is worth noting how many enjoyable activities involve fear



and willingly embrace risk taking.

Within the entire Risk Management literature (and this section of Wikipedia) you will find little or no reference to the human part of the risk equation other than what might be implied by the term 'compliant'. This illustrates the narrow focus that is a hall mark of much current risk management practice. This situation arises from the basic premises of traditional risk management and the practices associated with health and safety within the working environment. There is a basic logic to the idea that any accident must reflect some kind of oversight or situational predisposition that, if identified, can be rectified. But, largely due to an almost institutionalised neglect of the human factor, this situationally focused paradigm has grown tendrils that reach into every corner of modern life and into situations where the unintended negative consequences threaten to outweigh the benefits.

Positive Risk Management views both risk taking and risk aversion as complementary and of equal value and importance within the appropriate context. As such, it is seen as complementary to the traditional risk management paradigm. It introduces a much needed balance to risk management practices and puts greater onus on management skills and decision making. It is the dynamic approach of the football manager who appreciates the offensive and defensive talents within the available pool of players. Every organisation has roles better suited to risk takers and roles better suited to the risk averse. The task of management is to ensure that the right people are placed in each job.

Positive Risk Management relies on the ability to identify individual differences in propensity for risk taking. The science in this area has been developing rapidly over the past decade within the domain of personality assessment. Once an area of almost tribal allegiance to different schools of thought, today there is widespread consensus about the structure of personality assessment and its status within the framework of the cross disciplinary progress being made in our understanding of Human Nature. The Five Factor Model (FFM) [27] of personality has been shown to have relevance across many different cultures, to remain consistent over adult working life and to be significantly

heritable. Within this framework there are many strands which have a clear relationship to risk tolerance and risk taking. For example, Eysenck (1973) reports that personality influences whether we focus on what might go wrong or on potential benefits;[28] Nicholson et al. (2005) report that higher extroversion is related to greater risk tolerance;[29] McCrae and Costa (1997) link personality to tolerance of uncertainty, innovation and willingness to think outside the box;[30] Kowert, 1997) links personality to adventurousness, imagination, the search for new experiences and actively seeking out risk.[31] Building from these foundations of well validated assessment practices, more specialized assessments have been developed, including assessment of Risk Type.[32]

#### Risk Management Criticisms

However, researchers at the University of Oxford and King's College London found that the notion of complementarity may be a concept that does not work in practice. In a four-year organizational study of risk management in a leading healthcare organization, Fischer & Ferlie (2013) found major contradictions between rules-based risk management required by managers, and ethics-based self-regulation favoured by staff and clients. This produced tensions that led neither to complementarity nor to hybrid forms, but produced instead a heated and intractable conflict which escalated, resulting in crisis and organizational collapse. [33]

The graveyard of former greats is littered with examples where the balance of risk went seriously awry; the ENRON and RBS stories have become iconic references in the pantheon of corporate governance and corporate mortality. Eastman Kodak might be a nominee for the opposite pole – the corporately risk averse.

#### Risk Management and Business Continuity

Risk management is simply a practice of systematically selecting cost-effective approaches for minimising the effect of threat realization to the organization. All risks can never be fully avoided or mitigated simply because of financial and practical limitations. Therefore, all organizations have to accept some level of residual risks.

Whereas risk management tends to be preemptive, business continuity planning (BCP) was invented to deal with the consequences of realised residual risks. The necessity to have BCP in place arises because even very unlikely events will occur if given enough time. Risk management and BCP are often mistakenly seen as rivals or overlapping practices. In fact, these processes are so tightly tied together that such separation seems artificial. For example, the risk management process creates important inputs for the BCP (e.g. assets, impact assessments, cost estimates). Risk management also proposes applicable controls for the observed risks. Therefore, risk management covers several areas that are vital for the BCP process. However, the BCP process goes beyond risk management's preemptive approach and assumes that the disaster will happen at some point.

#### Risk Communication

Risk communication is a complex cross-disciplinary academic field. Problems for risk communicators involve how to reach the intended audience, to make the risk comprehensible and relatable to other risks, how to pay appropriate respect to the audience's values related to the risk, how to predict the audience's response to the communication, etc. A main goal of risk communication is to improve collective and individual decision making. Risk communication is somewhat related to crisis communication. There are seven cardinal rules for the practice of risk communication as expressed by the U.S. Environmental Protection Agency and several of the field's founders [34]

- Accept and involve the public/other consumers as legitimate partners (e.g. stakeholders).
- Plan carefully and evaluate your efforts with a focus on your strengths, weaknesses, opportunities, and threats (SWOT).
- Listen to the stakeholders specific concerns.
- Be honest, frank, and open.
- Coordinate and collaborate with other credible sources.
- Meet the needs of the media.

- **Speak clearly and with compassion.**

## Example of Risk Management in The supply Chain

### Reduce Your Supply Chain Vulnerability

Supply chain risk is recognized in today's economy as a major threat to business continuity. A break in the supply chain can reduce a company's revenue, decrease its market share, inflate costs, or threaten production and distribution.

As our clients' businesses change, so do their risk transfer needs. As companies outsource supply globally, revenue generation is increasingly tied to the external portion of the supply chain. This has increased client vulnerability to disruptions involving key suppliers, contract manufacturers, service providers and, ultimately, customers.

### About the Supply Chain Solution

The FM Global Supply Chain Solution combines market-leading coverage through our Advantage policy with awareness, assessment and risk mitigation resources designed to assist clients in better understanding how to identify and mitigate their own risk.

In order to provide increased capacity for supply chain exposures, we partner with our clients by providing them with expert engineering advice at their suppliers' locations. As we do with our client locations, FM Global has the ability to assess the supplier's risk and recommend mitigation solutions. This improved understanding of supply chain exposures allows us to provide additional coverage.

To learn more about your company's level of Supply Chain risk management sophistication, take a brief [assessment](#).

Clients can access more information and resources regarding Supply Chain on [MyRisk®](#).

For additional information about how we can help you better understand and minimize your organization's supply chain risk, please contact your FM Global client service team.



### Risk Identification and Assessment

#### » [Supply Chain Assessment](#)

Raise awareness of supply chain issues within your organization

### Risk Avoidance and Reduction

#### » [Managing Supply Chain Risk](#)

In this ten-minute video produced by CFO Research Services, J. Bradley Johnston, chief administrative officer of Temple-Inland and Bret Ahnell, FM Global senior vice president, discuss approaches to supply chain risk improvement

### Risk Acceptance and Transfer

#### » [Expanded Supply Chain Coverage](#)

The FM Global Advantage all risk policy offers broad Supply Chain coverage including Contingent Time Element Extended and Logistics Extra Cost. Where many insurance products protect against losses from direct suppliers, Contingent Time Element Extended (CTEE) extends coverage to primary suppliers as well as suppliers downstream.

» [Reducing the Risk through Cargo Protection](#)

FM Global's supply chain solution includes risk management of cargo-related exposures

**SOURCE** :[http://www.fmglobal.com/page.aspx?id=03030700&utm\\_campaign=Q12012\\_Supply\\_Chain\\_Brande&utm\\_medium=cpc&utm\\_source=Ying&utm\\_content=Solutions&utm\\_term=fm\\_global\\_supply\\_chain\\_risk\\_management\\_solutions\\_Broad](http://www.fmglobal.com/page.aspx?id=03030700&utm_campaign=Q12012_Supply_Chain_Brande&utm_medium=cpc&utm_source=Ying&utm_content=Solutions&utm_term=fm_global_supply_chain_risk_management_solutions_Broad)

## Appendix H: Financial Aspects of Sustainability References

### H.1 Introduction

This Appendix completes chapter 6 which presented our main findings and innovations from the study which relate to the financial aspects of sustainability. Literature references and key concepts (such as the value chain) from other authors can be found in this Appendix H.

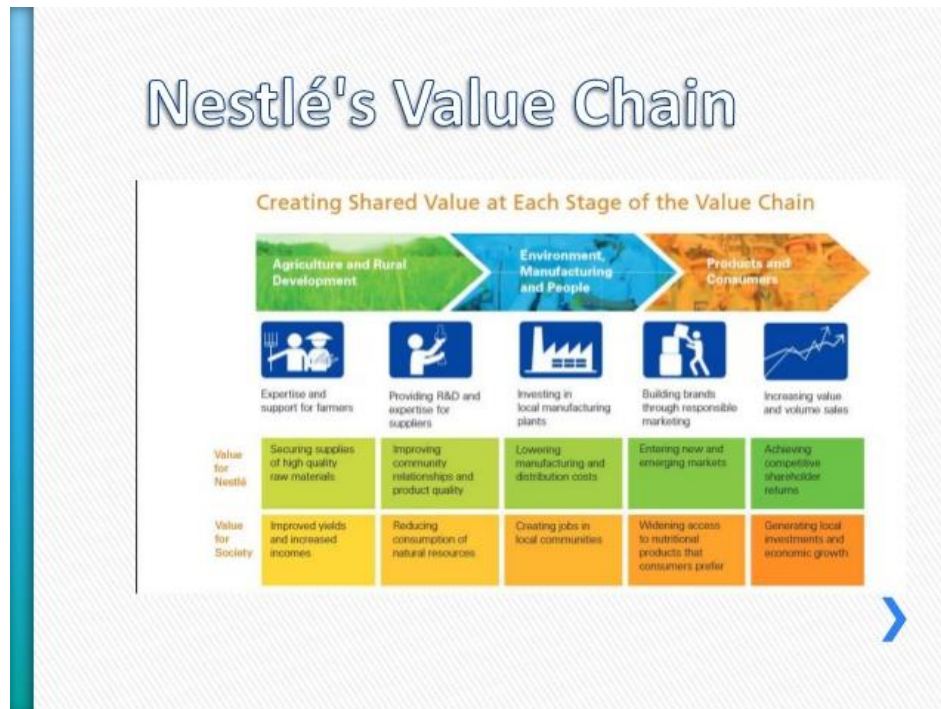
### H.2 The Value Chain and Sustainability

In order for companies to achieve environmental, social and economic goals throughout their organization, they need to integrate sustainability into their core processes.

Over the last 10 years several European Food and Beverage companies have published simplified versions of their value chain, as in Figure H.1 for Heineken and Figure H.2 for Nestle.

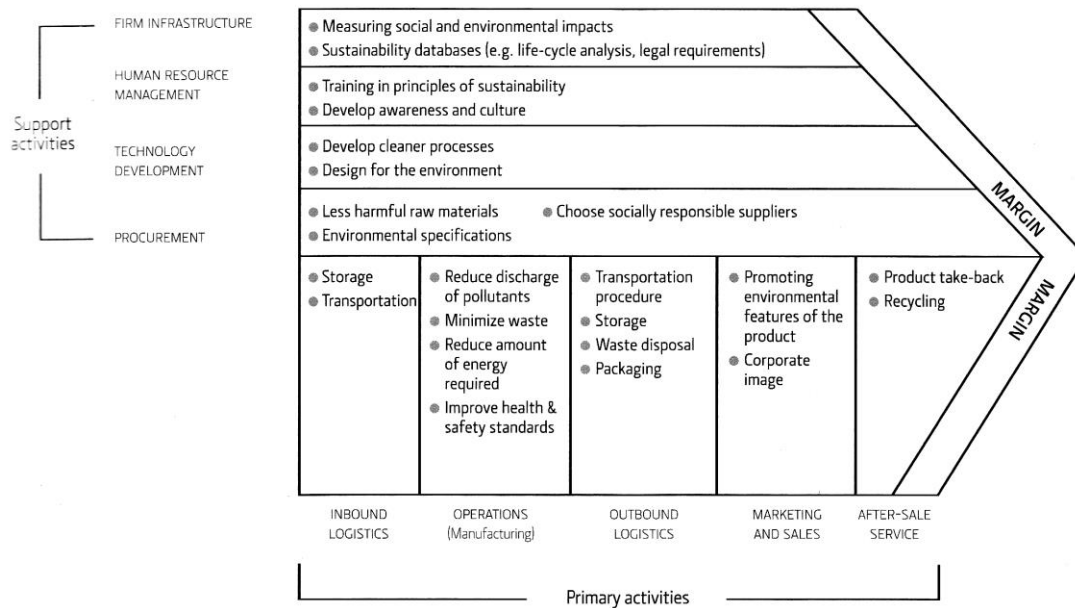


**Figure H.1 Heineken Sustainability Value Chain. Source: Heineken.com**



**Figure H.2 Nestle Sustainability Value Chain. Source: Nestle.com**

Professor Marc J. Epstein adapted the famous “Value Chain” diagram from Michael Porter’s (1990) *The competitive advantage of Nations* (p. 91 of *Making Sustainability Work*, (2008), Greenleaf publishing, San Francisco, USA) , to include the sustainability and social layers across the primary and support activities all of which are important to achieve the corporate goals, as seen in Figure H.3 below:



**Figure H.3: The Value Chain and Sustainability**

Source: Epstein and Roy (1998) “Managing the Corporate Performance” adapted from Michael Porter’s Value Chain.

In Figure H.3, each primary and support activity could be used to promote sustainability For instance:

Procurement: could find raw materials from sustainable sources of supply and produce with lower environmental impacts, they could find ways to reduce packaging and use more recycled materials, they could source from socially responsible suppliers within Western Europe and internationally.

Research and Development (R&D): could identify more efficient processes by finding new uses for waste products.

Marketing: could grow customer demand and preference for products and services that support the sustainability principles and how marketing, distribution and sales methods could reduce adverse social, environmental and economic impacts.

Production: could work with engineers and maintenance staff technicians to create processes that are more efficient and less costly in energy and resource use, as well as maintaining adequate health and safety standards.



Legal: could keep everyone abreast of (environmental, social, packaging, recycling, etc.) legislation on how to best share the information across the organization.

Management Accounting: could provide managers with information to make informed decisions on product/services costing and pricing, environmental friendly products and processes design and capital investments.

Financial Reporting and Auditing: could provide investors and stakeholders and the general public with disclosures related to the company's current and future prospects.

Public Relations (New Roles): could develop a social media and communication infrastructure platform to facilitate consumers experience with the company. This might include informing them of the history/tradition/commitments of the firm and give them information on the brands and reputation including a list of major achievements/successes in environmental and social and charitable activities. A reference of all quality standards used in the firm and certifications obtained. A reference to a good legislation conformity track record. Provide links to advertising and promotions resources and videos. Provide a list of NGOs with which the firm has an interaction and mention which are being in part financed/sponsored by the firm. Use social media to create a fan community within the public to listen to customers, introduce new products concepts and get feedback and to stay in touch through a loyalty program. Get volunteers from the public to test new products and propose changes to existing products/services. Poll fan group for future product needs and price they would be willing to pay for these new products. Invite fans to create a free profile so as to study their evolution and learn their likes/dislikes so as to improve their experience and retain them as customers.

We found a list of Life Cycle Sustainability Indicators for the Food system from a study from Heller and Keoleian that should be useful to companies wishing to monitor their sustainability implementations as seen in figure H.4 below.

Value Added Sustainable Procurement Customer's Perspective as perceived by companies :  
An Empirical Study of Western European Food and Beverage Companies.

Life cycle stage	Stakeholders	INDICATORS		
		Economic	Social	Environmental
Origin of (genetic) resource – seed production, animal breeding	Farmers Breeders Seed Companies	-degree of farmer/operator control of seed production/breeding	-diversity in seed purchasing and seed collecting options -degree of cross-species manipulation	-ratio of naturally pollinated plants to genetically modified/ hybrid plants per acre -reproductive ability of plant or animal -% of disease resistant organisms
Agricultural growing and production	Farm operators Farm workers Ag. Industry Ag. Schools Government Animals	-rates of agricultural land conversion -output/input productivity -% return on investment -cost of entry to business -farmer savings and insurance plans -flexibility in bank loan requirements to foster environmentally sustainable practices -level of gov't support	-average age of farmers -diversity and structure of industry, size of farms, # farms per capita -hours of labor/ yield and / income -avg. farm wages vs. other professions -# of legal laborers on farms, ratio of migrant workers to local laborers, -% workers with health benefits. -# of active agrarian community organizations -% of ag. Schools that offer sustainable ag. programs, encourage sustainable practices -# animals/unit, time animals spend outdoors (animal welfare)	-rate of soil loss vs. regeneration -soil microbial activity, balance of nutrients/acre -quantity of chemical inputs/ unit of production -air pollutants/ unit of production -number of species/acre -water withdrawal vs. recharge rates -# of contaminated or eutrophic bodies of surface water or groundwater -% waste utilized as a resource -veterinary costs -energy input/ unit of production -ratio of renewable to non-renewable energy -portion of harvest lost due to pests, diseases
Food processing, packaging and distribution	Food processors Packaging providers Wholesalers Retailers	-relative profits received by farmer vs. processor vs. retailer -geographic proximity of grower, processor, packager, retailer	-quality of life and worker satisfaction in food processing industry -nutritional value of food product -food safety	-energy requirement for processing, packaging and transportation -waste produced/ unit of food -% of waste and byproducts utilized in food processing industry -% of food lost due to spoilage/mishandling
Preparation and consumption	Consumers Food service Nutritionists/ Health professionals	-portion of consumer disposable income spent on food -% of food dollar spent outside the home	-rates of malnutrition -rates of obesity -health costs from diet related disease/conditions -balance of average diet -% of products with consumer labels -degree of consumer literacy regarding food system consequences, product quality vs. appearance, etc. -time for food preparation	-energy use in preparation, storage, refrigeration -packaging waste/ calories consumed -ratio of local vs. non-local and seasonal vs. non-seasonal consumption
End of life	Consumers Waste managers Food recovery & cleaning orgs	-ratio of food wasted to food consumed in the US -\$ spent on food disposal	-ratio of (edible) food wasted vs. donated to food gatherers	-amount of food waste composted vs. sent to landfill/incinerator/ waste water treatment

**Figure H.4: Life Cycle Sustainability Indicators for the Food System** from a study. Source: Heller M. C. and Keoleian G. A., (2000)

### H.3 Accounting Aspects of Sustainability

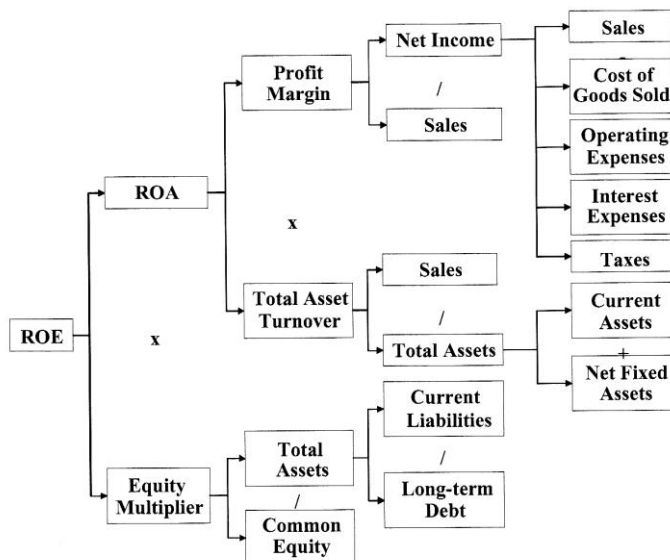
Once a company has formulated a sustainability strategy, management trains employees and develops the processes that will support these goals. Later when the plan is put into effect, it is important for management to be able to see how this sustainability investment/effort has performed. Financial analysis is the assessment of the company performance so as to identify its strengths and weaknesses. Some authors have criticized a reliance on accounting measures (Cohem 1994; Mattessich 1995) but we believe that these tools provides a context of a company's current performance and expectations by showing developments that will change future performance – such as the internal development possibilities of the company that bring about value creation. The ratios thus help compare a company with others in the same industry draw conclusions for the sector, and determine if the company is good, average or bad compared to other companies in the same industry. The DuPont ratios Pyramid as seen in Figure H.5 is used to dissect a

company's financial statements and to assess its financial condition. It merges the income statement and the balance sheet into two summary measures of profitability, namely the Return on Assets (ROA) and Return on Equity (ROE), which are broken down as follows:

$$ROE = \frac{\text{Net Income}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Common Equity}}$$

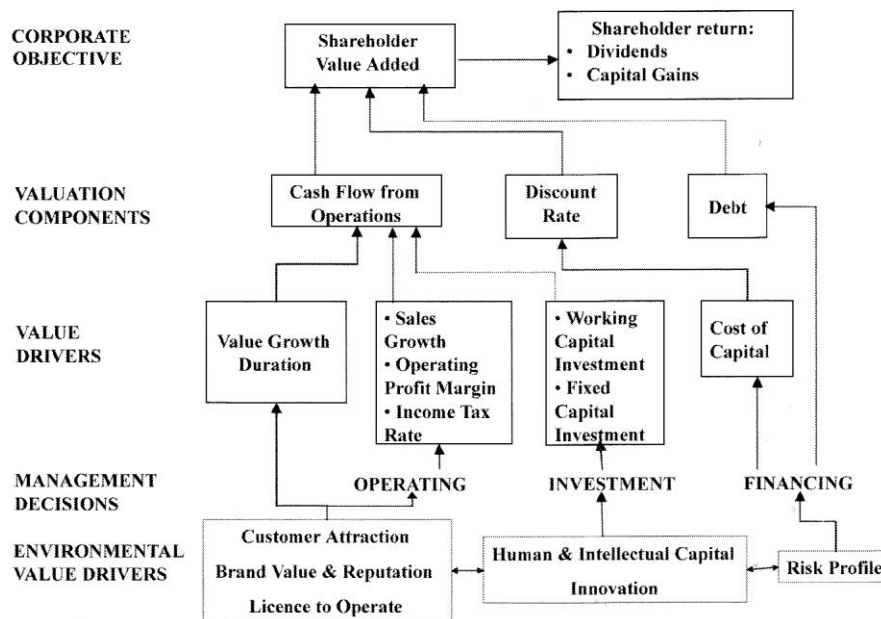
$$ROA = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$$

$$ROE = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Common Equity}}$$



**Figure H.5 DuPont Ratios Pyramid.**

The main benefit of this approach is that it helps on the value drivers as seen below in Figure H.6 the conceptual model of financial analysis on sustainability.



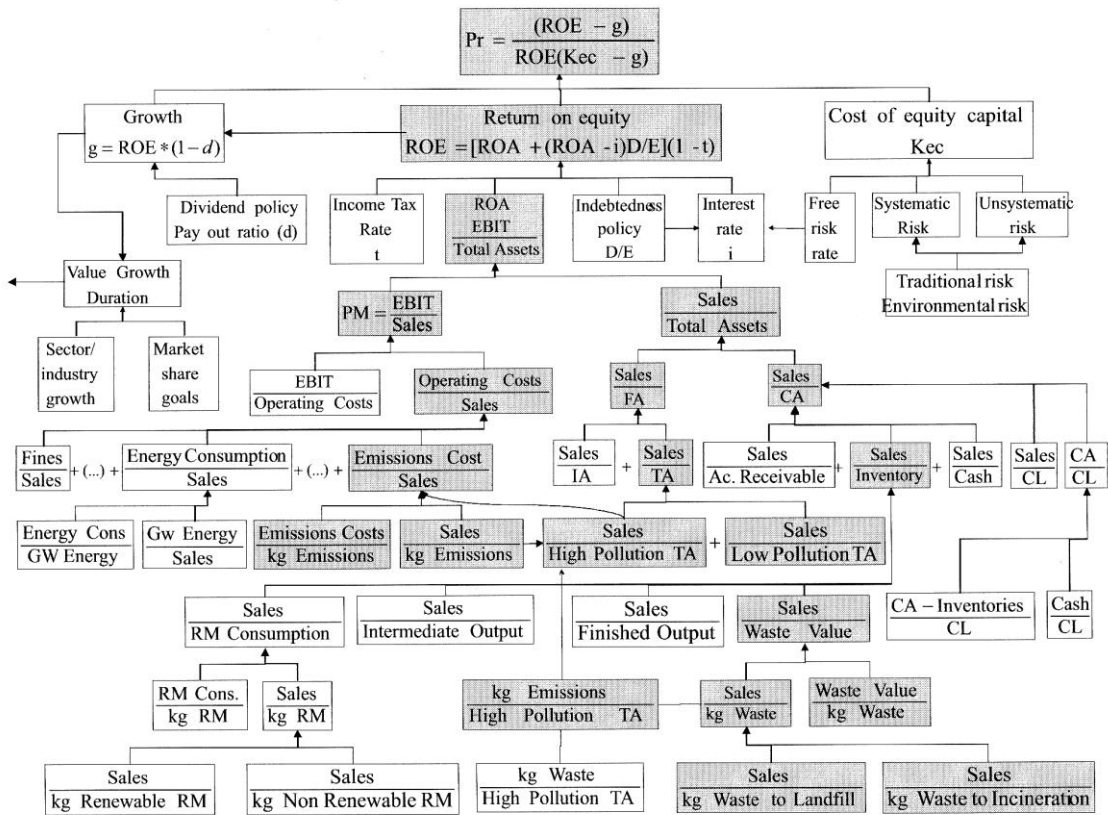
**Figure H.6 The Conceptual Model of Financial Analysis on Sustainability**

**Source:** Chousa J.P and Castro N. R, (2006)

The analysis of ratios such as sales/waste value, cost of emissions / sales, environmental fines/sales , etc. can add valuable information to company stakeholders, while high sales/fixed assets ratio may be signaling an improved ROA and ROE, other ratios such as a high cost of emissions/sales ratio and/or a high environmental files/sales ratio will limit profit generation of the company and a low sales/waste value ratio will reduce the sales/current assets ratio, thus compensating for the high value initially found for the sales/fixed assets ratio. This means that the management team of the company may have to explain to its stakeholders that the increment in the sales/fixed assets ratio has been compensated by the reduction of the sales/current assets ratio in such a way that the ratio sales/total assets remains unchanged and does not affect the ROA, while the profit margin has fallen so much that the result is a reduction of the ROA. Furthermore, if we have a damage to the company's image, that could reduce its sales, cause a loss to the market share and limit its potential for growth, all of which ultimately will impact the share price (Pr) on the stock market.

This particular model was summarized by Chousa and Castro already

mentioned in the previous Figure by highlighting in Grey the extended financial analysis of sustainability ratios as seen in Figure H.7 below.



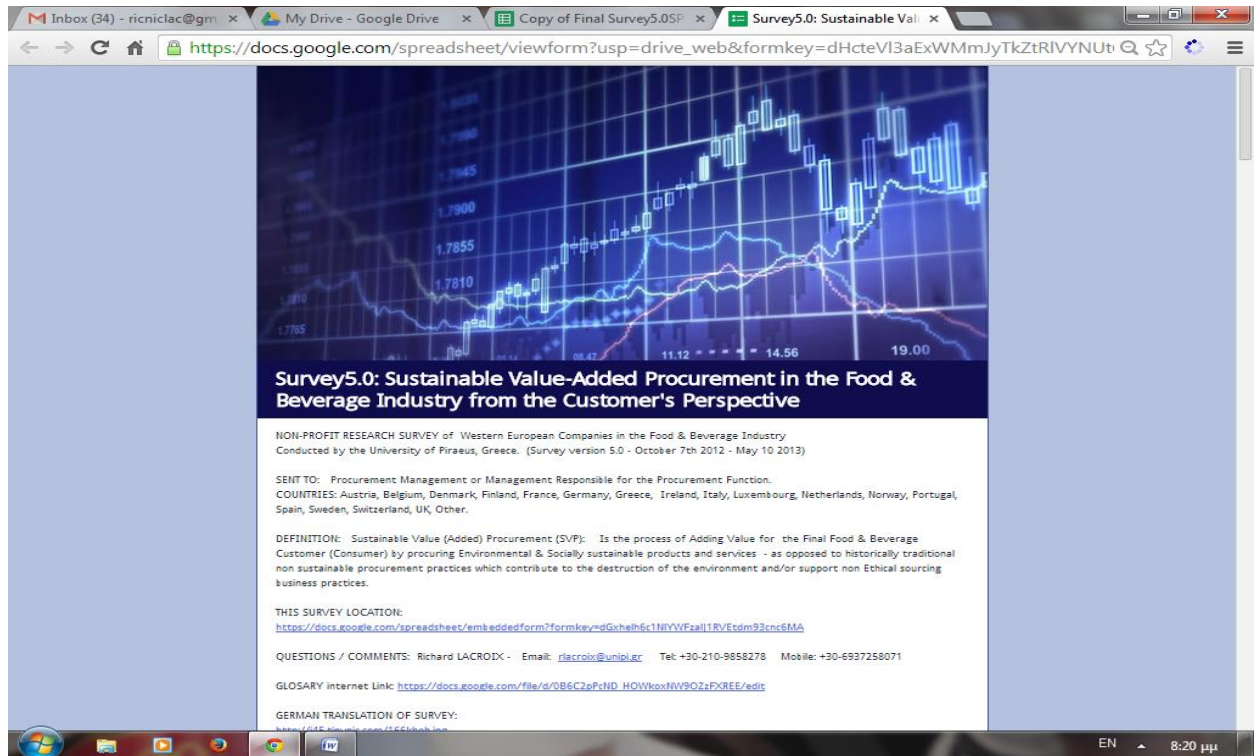
CA = Current Assets; CL = Current Liabilities; D = Debt; d = Payout Ratio; E = Equity; EBIT = Earnings Before Interest and Tax; FA = Fixed Assets; g = Growth; i = Interest Rate (cost of debt); IA = Intangible Assets; Kec = Cost of Equity Capital; PM = Profit Margin; RM = Raw Materials; ROA = Return on Assets; ROE = Return on Equity; t = Income Tax Rate; TA = Tangible Assets

**Figure H.7 Financial Model of Sustainability.** Source: Chousa J.P and Castro N. R, (2006), p. 139.

## Appendix I: Financial Statistical Analysis Details from Chapter 4

### I.1 Screenshots from the electronic questionnaire.

Screenshots of the electronic questionnaire of our study.



The screenshot shows a web browser window displaying a Google Docs spreadsheet form. The browser's address bar shows the URL: [https://docs.google.com/spreadsheet/viewform?usp=drive\\_web&formkey=dHcteVI3aExWMMjYTkZtRIVYNu](https://docs.google.com/spreadsheet/viewform?usp=drive_web&formkey=dHcteVI3aExWMMjYTkZtRIVYNu). The form content includes:

**Survey5.0: Sustainable Value-Added Procurement in the Food & Beverage Industry from the Customer's Perspective**

NON-PROFIT RESEARCH SURVEY of Western European Companies in the Food & Beverage Industry  
Conducted by the University of Piraeus, Greece. (Survey version 5.0 - October 7th 2012 - May 10 2013)

SENT TO: Procurement Management or Management Responsible for the Procurement Function.  
COUNTRIES: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK, Other.

DEFINITION: Sustainable Value (Added) Procurement (SVP): Is the process of Adding Value for the Final Food & Beverage Customer (Consumer) by procuring Environmental & Socially sustainable products and services - as opposed to historically traditional non sustainable procurement practices which contribute to the destruction of the environment and/or support non Ethical sourcing business practices.

THIS SURVEY LOCATION:  
<https://docs.google.com/spreadsheets/embeddedform?formkey=mgGxh6h5c1N1YVWZa11RVtcm93cnc6MA>

QUESTIONS / COMMENTS: Richard LACROIX - Email: [rlacroix@unipi.gr](mailto:rlacroix@unipi.gr) Tel: +30-210-9858278 Mobile: +30-6937258071

GLOSSARY internet Link: [https://docs.google.com/file/d/0BEC7zFzFD\\_HOWkoxW9OZzFXRE/edit](https://docs.google.com/file/d/0BEC7zFzFD_HOWkoxW9OZzFXRE/edit)

GERMAN TRANSLATION OF SURVEY:  
<https://www.researchgate.net/publication/222146136>

Inbox (34) - ricniclac@gm... My Drive - Google Drive Copy of Final Survey5.0SP Survey5.0: Sustainable Val...

https://docs.google.com/spreadsheets/viewform?usp=drive\_web&formkey=dHcteVl3aExWMMmJyTkZtRIVYNUti

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<https://docs.google.com/spreadsheets/embeddedform?formkey=dGxh6h6c1N1YWFza1lRVtEdm93cnc6MA>

QUESTIONS / COMMENTS: Richard LACROIX - Email: [rlacroix@unipi.gr](mailto:rlacroix@unipi.gr) Tel: +30-210-9858278 Mobile: +30-6937258071

GLOSSARY internet Link: [https://docs.google.com/file/d/0B6C2pPcND\\_HOWkoxNW9OZzFXREE/edit](https://docs.google.com/file/d/0B6C2pPcND_HOWkoxNW9OZzFXREE/edit)

GERMAN TRANSLATION OF SURVEY:  
<http://45.cinypic.com/166khoh.jpg>  
 Deutsche Übersetzung des Forschungsvermessungstextes und Bezweifelt - Internetverbindung  
[https://docs.google.com/file/d/0B6C2pPcND\\_HOUDIFvzN0dTZvE0/edit](https://docs.google.com/file/d/0B6C2pPcND_HOUDIFvzN0dTZvE0/edit)

FRENCH TRANSLATION OF SURVEY:  
<http://45.cinypic.com/2i749d1.jpg>  
 Traduction française du Texte de l'Enquête de Recherche et Questions - Lien Internet  
[https://docs.google.com/file/d/0B6C2pPcND\\_HOVkpUz2rRtljvSVE/edit](https://docs.google.com/file/d/0B6C2pPcND_HOVkpUz2rRtljvSVE/edit)

\* Required

01 - Company \*

02 - Country \*

Select from Country Code

43

03 - Company Address \*

Inbox (34) - ricniclac@gm... My Drive - Google Drive Copy of Final Survey5.0SP Survey5.0: Sustainable Glossary.doc

https://docs.google.com/file/d/0B6C2pPcND\_HOWkoxNW9OZzFXREE/edit

Glossary.doc

File Edit View Help

Richard-Nicolas Lacroix

Comments Share

### Sustainability Glossary

**Biodiversity Metrics Development:** Review of existing biodiversity and land-use metrics and evaluation of potential for use in Standards for Measurement and Reporting (SMRS) and as Sustainability Performance Drivers (SPD). Identify gaps or research needs in metrics, driver, indicator development. Pursue avenues to fill those gaps via collaborations with researchers, NGO experts and corporate/retail leaders. (e.g. leaders in the US: Coca-Cola, General Mills, Inc., Kellogg's, Mars, Inc., McDonald's, MillerCoors, Monsanto Company, PepsiCo, Inc., Unilever, etc. Source: <http://www.sustainabilityconsortium.org/food-beverage-agriculture/>)

**Consumer:** A Consumer is an individual member of the general public, who is purchasing or using goods, property, or services for private purposes.[1] Footnotes  
 1. International Organization for Standardization. (2006c). ISO 14025: Environmental labels and declarations - Type III environmental declarations - Principles and procedures. ISO: Switzerland.

**Ecoinvent:** Ecoinvent is a database developed by the Swiss Centre for Life Cycle Inventories. The database accommodates approximately 4,000 databases for products, services, and processes often used in LCA case studies. [1] Footnotes, 1. Frischknecht, R. & Jungbluth, N. (2007). Overview and methodology. Swiss Centre for Life Cycle Inventories, 77p.

**Ecolabel:** An ecolabel is a voluntary approach to environmental certification of products meeting specific criteria or standards. Ecolabels can be classified in single attribute or multi-attribute standards. According to the International Organization for Standardization[1] three main types of environmental labels exist, including product category based on life cycle, informative self-declaration claims, and third-party accredited labels based on quantified environmental data of a product. Footnotes  
 1. International Organization for Standardization. (2006c). ISO 14025: Environmental labels and declarations - Type III environmental declarations - Principles and procedures. ISO: Switzerland.

**Ecosystem Quality:** Ecosystem quality includes measurable attributes from an ecosystem performance including biodiversity, ecosystem functions, and ecological resources.[1] Footnotes 1. Koellner, T. (2002). Land use in product life cycles and its consequences for ecosystem quality. International Journal of Life Cycle Assessment.

Value Added Sustainable Procurement Customer's Perspective as perceived by companies :  
An Empirical Study of Western European Food and Beverage Companies.

The screenshot shows a Google Docs interface for a document named 'german5.docx'. The document content is in German and describes a survey titled 'Survey5.0: Nachhaltige Wert-Zusätzliche Besorgung in der Speise & Getränk-Industrie von der Perspektive die GEMEINNÜTZIGE FORSCHUNG VERMESSUNG von Westlichen europäischen Firmen von dem Kunden in der Speise & Getränk-Industrie - Geleitet durch die Universität von Piraeus, Griechenland. (Vermessungsversion 5,0 – Januar-April 2013)'. The text includes a purpose statement, a list of countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom), a definition of Sustainable Value (SVP), and contact information for Richard LACROIX. The survey questions are numbered 01 to 05.

The screenshot shows a Google Docs interface for a document named 'french5.doc'. The document content is in French and describes a survey titled 'Survey5.0: L'Approvisionnement Durable à Valeur ajoutée dans l'industrie des Aliments et des Boissons du point de vue du Consommateur'. The text includes a purpose statement, a list of countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom), a definition of Sustainable Value (SVP), and contact information for Richard LACROIX. A link to an online questionnaire is provided. The survey questions are numbered 01 to 03.



## I.2 Lists of Companies Surveyed

List of food only companies surveyed.

Sovex - Sociedade Internacional de Viveres, Lda

Société Nouvelle La Charlotte (S.N.L.C.)

PITENIS, A., BROS S.A.

NATURALIA, Srl

marinex foods

HELLENIC FISH FARMING S.A.

Les Produits de Bardo

S. Fassbind SA; S. Fassbind Ltd.

Mulligans Gluten Free Bakery

Dunleavy Meats Ltd

Lervig Aktiebryggeri AS

Lindeboom Bierbrouwerij BV

La Cave du Roy SPR

António Fernandes Martins, Lda

Mireille Oster Pain d'Epices

Vins d'Alsace Jean Biecher et Fils

l'Ourika

GERANI SOFTDRINKS S.A.

Hédiard

LOUX MARLAFEKAS S.A.

Coop Danmark A/S

Biosana AG

Beltrán Muñoz, S.L.

Emil Roloff KG

Gielly

DHC Nutrition

Provence Gastronomie

Drasco NV (De Roy Verenigde Handelsmaatschappij NV)

Transorga Food AG

Rammelmeyer AG

Eismann-Tiefkühlservice AG

Gebrüder Roelli AG

Delitrade AG

Hiestand Austria GmbH

Bagro Food NV

Koelwaren Biebuyck NV

A. Lenaers Horeca en Diepvriescentrum NV

Diepvries Badeco NV (Precon)

Comptoir Européen des Glaces et Sorbets SA (Ceges)

Tomex Danmark A/S

A Frost A/S ( AFrost )

Anbo Foods A/S

Bønnelykken A/S

Sepio A/S

J.P. Klausen & Co. A/S

Carl B. Feldthusen A/S

Lucien Lassalle et Fils (Sté d'Exploitation des Ets)

Theray

FREMUREC

Sobreco

Andelle sas

La Capuche

Sodimon

Serdis

Sa Tilbrai  
Lepol (Intermarché)  
Ehninger GmbH & Co. KG  
General Mills Holding One Germany GmbH  
Kaufland Warenhandel GmbH & Co. KG  
APICELLA LUIGI & FIGLI, Srl (Div. Wts)  
Inersys SÀRL  
BBC Quality Pastries BV  
Distribuciones Cafin , S.A.  
Celiza S.L.  
Depicar Ckc Congelados S.L.  
S3 Strategic Sourcing Solutions, S.L.  
Nutricia GmbH  
BIOLIFE SPRL  
ECO-ONE BVBA  
HYPO-CAL-PHARMA NV  
Hagor NV  
Frutarom Belgium NV  
Hain Europe NV  
Ardimex SPRL  
Kaneka Pharma Europe NV  
Districo CVBA  
Damhert Nutrition NV  
Snick Euro-ingredients NV  
AB MAURI BELGIUM  
Bros & Cy BVBA  
Intropa NV  
Firma Jan Gevers BVBA  
Basic Bakery BVBA

Synaco SA  
Doucy SPRL  
Niche Trading NV  
HCH Gruppen A/S  
Jens Møller Products ApS  
KT Food ApS  
Marinova ApS  
sandwich.dk ApS  
Secret Kitchen, Engros ApS  
Biosa Danmark ApS  
Honum Holding A/S  
Oy Valora Trade Finland Ab  
A&R Sveholm Oy  
Bomat Oy  
Custom Kitchen Oy Ltd  
Foodgate Oy  
H. Kontio Oy  
Härmän SnackPoint Oy  
Jalon Mylly Oy  
Leipomo Suloiset Gluteenittomat Oy  
Lejos Oy  
Marja Bothnia Berries Oy Ltd  
Nutricia Baby Oy  
Office Deli Oy  
Oy Semper Ab  
Oy Valioravinto Ab  
Pommerherkku Oy  
Prominent Food GMP Oy  
Puljonki Oy

MDC Pack

MDC Pack

Vitagermine

Midex

Midex Havre

la Centrale des Multiples (CDM)

ITM ALIMENTAIRE SUD OUEST

SNC des Cash Corses

SNC des Cash Corses

PROPIZZA

Delpidis

Sarl JFL Distribution

Sarl Galio

Lamuredis

Mel Distrib

Tanot et Associés

Sarl Candido

Eeelpa SA

Fraidis

Gardis

Soleda Négoce

Vital SA

Eurogerm

Back Europ Export Sarl (B.E.X.)

Ab Mauri France

La Littorale

Louis François

Moulins de Versailles

Thomas Challans

Laffort Oenologie

Nutrilyls

Bressmer & Francke (GmbH & Co.) KG

Neukircher Zwieback GmbH

CEREAL TERRA, Sas (di Rossetti Nadia & C.)

DEIMOS, Srl

KOSTNER ANDREAS, Srl

LO BELLO FOSFOVIT, Srl

MATER NATURA, Srl

P.R.D., Srl

FRATELLI BISIO FU ARISTIDE, Sdf

I.T.S. FARMA, Srl

LA MARGHERITA, Srl

SYRIO, Srl

SNACK SERVICE, Srl

Food Brokers BV

Stepan Lipid Nutrition BV

Lypack BV

Den Blinde Ku AS

Eggprodukter AS

Lillehammer Ysteri AS

Minutt Mestern AS

Pharma Marine AS

Pizza Heart AS

Arvid Nordquist Norge AS

Caterplus - Comercialização e Distribuição Produtos de Consumo, Lda

Alberto Marques & Filhos, S.A.

Ramirezia, Lda

Campos Ferreira & Machado, Lda

Farmácia Turcifalense - Barreiros & Anacleto, Lda  
L. Ribeiro - Promoção e Distribuição Alimentar, Lda  
SRI - Sociedade Reunida de Industrias, Lda  
Hero España, S.A.  
Alimentacion Y Nutricion Familiar , S.L.  
MBC Promocionarium, S.L.  
Beslan, S.L.  
Dulcinea Nutricion, S.L.  
Productos Naturales Sitges, S.A.  
Redu-Body S.L.  
Aprimadiet , S.L.  
Dieta Proteica , S.L.  
Enfrua , S.L.  
Enzime , S.L.  
Laboratorios Bequi, S.a. , S.L.  
Laboratorios Ferqui, S.a.  
Productos Biologicos Dieteticos Y Naturales , S.L.  
Quimi Farma 2007 , S.L.  
Suplements Beverly , S.L.  
Distribuidora Internacional De Alimentación, S.A. (DIA%)  
Bimbosan AG  
GLOBOFOOD SA  
Holle baby food GmbH  
Andrews Milling Ltd  
C Marston & Sons  
Canterbury Wholefoods  
Cobbs Health Foods  
Country Products Ltd  
Grangestone Grain Co

Organix Brands Ltd

Die Wachauer Privatdestillerie Hellerschmid e.U. Inhaber Bernhard Hellerschmid

Markus Schmitt

Grandes Distilleries de Charleroi SA

Vasco NV-SA

De Roy Verenigde Handelsmaatschappij NV

Leukenheide BVBA

Brauerei Schloss Eggenberg Stöhr & Co. KG

Braucommune in Freistadt

Privatbrauerei Zwettl Karl Schwarz GmbH

Brouwerij der Trappisten van Westmalle CVBA

Brouwerij De Zavel - Brasserie Le Sablon

Taste Flavour Creators SA

Aktieselskabet Thisted Bryghus

Bryggeriet S. C. Fuglsang A/S

Bryggeriet Skands A/S

Erik Sørensen Vin A/S

Fur Bryghus ApS

Hancock Bryggerierne A/S

Indslev Bryggeri A/S

Køge Bryggeri ApS

Midtfyns Bryghus A/S

Mylius-Erichsen Bryghus A/S

natupharma A/S

A-Beverages Oy

Carlow Brewing Company

Guinness UDV Diageo (Ireland)

Bunratty Mead & Liqueur Co Ltd

Coachbury Caverns



Wexford Brewing Company  
Brasserie Nationale (Bofferding) SA  
Brasserie Simon SECS  
Rotterdamsche Producten Mij.  
Brouwerij De Fontein VOF  
Brouwerij De Molen BV  
Olm Nederland BV  
Bierbrouwerij Oirschots Bier BV  
Budelse Brouwerij B.V.  
Hertog Jan Brouwerij  
Lindeboom Bierbrouwerij B.V.  
Bierbrouwerij De Koningshoeven BV  
Bierenko Amsterdam BV  
Brouwerij Palm BV  
De Brouwketel BV  
Atna ØI AS  
Berentsens Brygghus AS  
Brewery International AS  
Jensen & Co AS  
K G Puntervold AS  
Union Bryggeri AS  
Lervig Aktiebryggeri AS  
Orkla Brands AS  
Unicer, Bebidas de Portugal, SGPS, S.A.  
Cervejeira Lusitana, Lda  
Suma Export Trading S.L.  
Export Armangué (Lluís Armangué Torrent)  
Muizenberg, S.L.  
Micromalta , S.L.

Comercial Fenoy Bcn , S.L.  
Hermanos Vicente , Sanchez Ca, S.a. Vaquero , S.L.  
Comercial Distribuidora De Bebidas, S.A. (CODIBESA)  
Fresinco Bebidas, S.A.  
Sonjo Produkter AB  
Aqua Terrena International AB  
Arno Holm Gävle AB  
Banco Bryggeri AB  
Bryggerhuset i Sigtuna AB  
Börje Bengtssons Öl och Läsk, AB  
Dugges Ale- och Porterbryggeri AB  
Eskilstuna Ölkultur AB  
Fontana Food AB  
Gamla Slottskällans  
Grebbe stad Bryggeri AB  
Hantverksbryggeriet AB  
Helsingborgs Bryggeri AB  
Jämtlands Bryggeri AB  
Kallholmens Maltbryggeri AB  
Lundabryggeriet AB  
Malmö Bryggerhus AB  
Kornhausbräu AG  
Aktienbrauerei Flims Surselva AG  
Brauerei Erusbacher & Paul AG  
Bill & Siegfried Getränke AG  
Lozärner Bier AG  
Brauerei Stadtbühl  
Brauerei Adler AG  
Birrificio Ticinese SA

Brauerei Felsenau AG

LägereBräu AG

Sonnenbräu AG

#### List of beverage only companies surveyed

J. García Carrión, S.A.

Continentale Nutrition

Bodin la Volaille Biologique (Bodin et Fils SAS)

Vert Product Ingredients (V P I)

Vinpol Sp. z o.o. Grupa Henkell & Co.

Beauvais Foods

FERRARI F.LLI LUNELLI, SpA

Meira Nova Oy

Morandell International GesmbH

Cogel SA

Caramelos La Pájara, S.L.

Alsvåg Fiskeprodukter AS

Lesieur

Kraft Foods Danmark ApS

BARILLA HELLAS S.A.

Juve & Camps, S.A.

Robert Cain Brewery (The Robert Cain Brewery)

Semper AB

Spa Monopole SA (Spadel)

Milka Käse AG Burgdorf

Divina Food AG

Blasko Convenience Fertiggerichte GesmbH, Wilhelm

ISPC Gent NV

Pandalus A/S

Credin Bageripartner A/S  
Nowaco A/S  
Ardo A/S  
DANISH SUPPLY CORPORATION A/S  
S.A.S. René Toy  
Desmont (LECLERC)  
Lisieux Surgelés  
Aldi Einkauf GmbH & Co. OHG  
Sabalar - Sociedade Industrial de Alimentos, Lda  
Radevi Canarias S.L.  
José Luis Arbués, S. L.  
Bide Onera Vasca, S.c. L.  
Hipp Produktion Gmunden GmbH & Co.KG  
Milupa GesmbH  
ORTIS SPRL  
P.A.B. NV  
Nutricia België NV  
Fasska SA  
Portion Pack Belgium NV  
Algist Bruggeman NV  
CSM Benelux NV  
Arctic Import A/S  
De Danske Gærfabriker A/S  
Fortitech Europe ApS  
Kraft Foods Finland  
United Pharmaceuticals SAS  
Ets Favrichon et Vignon  
C.A.P.S.E.R.V.A.L  
Nutriset Sas

Viralex

Montpon Distribution

Proxima Provencia

DSM Food Specialties France

Société Industrielle de Levure Fala (Silfala)

Société Française Laboratoire d'Oenologie (Sofralab)

Sensient Flavors

Dr Oetker France SAS

HiPP GmbH & Co. Vertrieb KG

HUMANA GmbH

J.M. Gabler Saliter GmbH & Co. KG

Lactoland Trockenmilchwerk GmbH

LHG Lebensmittelhandels- gesellschaft mbH & Co. Betriebs KG

Töpfer GmbH

WCO Kinderkost GmbH Conow

Abbott Ireland

EUROSICMA, SpA

BONOMELLI, Srl

HUMANA ITALIA, SpA

MELLIN, SpA

PRETI DOLCIARIA ALIMENTARE, Srl

QUALITY FOOD GROUP, SpA

TRENTOFRUTTA, SpA

KI GROUP, SpA

LEM MARKET, SpA

COAL, Srl

Nutricia Nederland BV

Frieslandcampina Kievit BV

Mead Johnson BV

Stiftelsen Helios Jordbruks- og Naturprodukter  
Vågsbygd Delikatesse AS  
Asko Drammen AS  
ASKO Agder AS  
Milupa Comercial - Comercialização de Produtos Alimentares, S.A.  
Alter, S.A.  
Novartis Consumer Health - Produtos Farmacêuticos e Nutrição, Lda  
Saner - Sociedade Alimentar do Norte, S.A.  
Centro Farmacêutico Nacional, S.A.  
Galletas Angulo, S.A.  
bio-familia AG  
HOCHDORF Nutricare AG  
HOCHDORF Holding AG  
Milupa S.A.  
A D M Milling Ltd  
Allied Mills  
Cereal Partners UK  
European Oat Millers Ltd  
Heygate Ltd  
Herbert Rath  
Mozart Distillerie GmbH  
Obermurtaler Brauereigenossenschaft in Murau reg. GenmbH  
Hubertusbräu Johann Kühtreiber Laa/Thaya  
Brouwerij L. Huyghe Delirium NV  
A/S Bryggeriet Vestfyen  
Carlsberg Breweries A/S  
Harboes Bryggeri A/S  
MATAS A/S  
Great Northern Brewery

Diageo Ireland Customer Contact Centre  
Diageo Global Supply  
Franciscan Well Micro Brewery Co Ltd  
Munhowen SA  
Brasserie de Luxembourg Mousel-Diekirch SA  
Grans Bryggeri AS  
AS P Ltz Aass  
Macks Ølbryggeri AS  
Vectura AS  
Empresa de Cervejas da Madeira, Sociedade Unipessoal, Lda (ECM)  
Sumol + Compal, S.A.  
Fábrica de Cervejas e Refrigerantes João de Melo Abreu, Lda  
Alregi, S.L.  
Vera Mañogil Hermanos, S.L.  
Penibetica De Cervezas Y Bebidas, S.L.  
Grupo Wasabia Internacional, S.L.U.  
Bodegas Valdepeñas De Coria, S.A.  
Cervezas Especiales Alemanas, S.L.  
Cervezas Moritz S.A.  
Estrella De Levante Fábrica De Cervezas, S.A.  
Gmodelo Europa S.A.  
Kopparbergs Bryggeri AB  
Krönleins Bryggeri AB  
Hotel Sántispark  
Bière du Boxer S.A.  
Brauerei Locher Aktiengesellschaft  
Brauerei Locher Aktiengesellschaft  
Brauerei Schützengarten AG  
Theodor Rietschi AG

## List of surveyed companies which belong to both Food & Beverage Industry

AS Nestlé Norge  
Le Petit Basque  
Daniel Thwaites plc  
Danone Produits Frais France  
Tulip Food Company P/S  
MYTHOS BREWERY S.A.  
Nestlé France  
Paterson Arran The Royal Burgh Bakery Ltd  
Albatros Seafood ApS  
Coop Danmark A/S  
BHJ A/S  
YIOTIS S.A.  
Rivöfjorden Förvaltning AB  
Saarioinen Oy  
MEVGAL S.A. - DAIRY PRODUCT INDUSTRY  
Alfred Ritter GmbH & Co. KG  
Nordic Sugar AB  
Chocoladefabriken Lindt & Sprüngli GmbH  
Spitz GesmbH, S.  
Bischofszell Nahrungsmittel AG  
frigemo ag  
Ardo Austria Frost GmbH  
Syréal Belgium NV  
PinguinLutosa NV  
Reitan Distribution A/S



Uhrenholt A/S

Stockmann Oyj Abp

Picard Surgelés

Thiriet Distribution

Combi-Verbrauchermarkt Einkaufsstätte GmbH & Co. KG

EDEKA Handelsgesellschaft Südwest mbH

famila Verbrauchermarkt Einkaufsstätte GmbH & Co.KG

Georg Jos. Kaes GmbH

Lidl Dienstleistung GmbH & Co. KG

METRO AG

Neukauf Südbayern GmbH

Plus Warenhandelsgesellschaft mbH

REWE-DORTMUND Großhandel eG

REWE-Zentral-AG

Tengelmann Warenhandelsgesellschaft KG

Nestlé Österreich GesmbH

Nestlé Belgilux SA

Cargill BVBA

Valio Oy

Oy Arvid Nordquist Finland Ab

Nestlé France

Danone

Bledina

Bledina baby foods

Société Industrielle de Transformation de Produits Agricoles (S.I.T.P.A.)

Société d' Exploitation de la Grande Epicerie de Paris (SEGEP)

Danone Research Centre France

Azelis France

BASF France

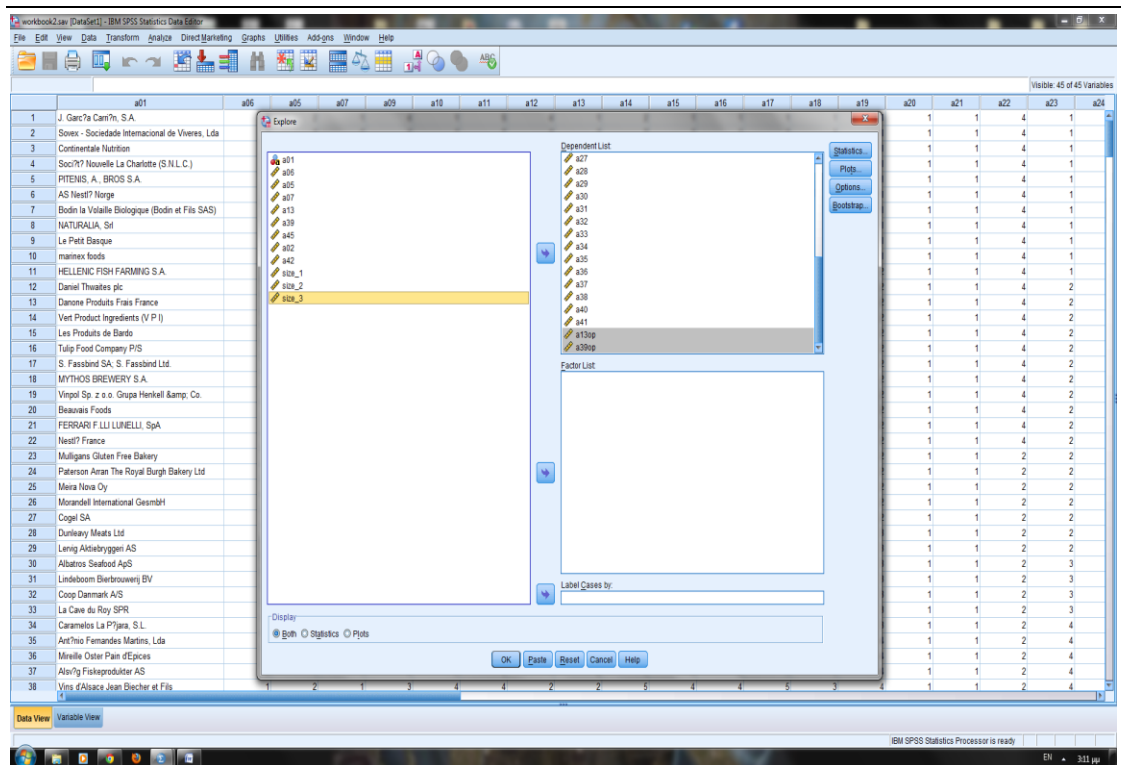
Dailycer Deutschland GmbH  
Dr. Oetker GmbH  
Krüger GmbH & Co. KG  
Milupa GmbH  
Nestlé Deutschland AG  
Nestlé Deutschland AG  
Pfizer  
PRENATAL, Sas  
METRO ITALIA CASH AND CARRY, SpA  
UNIFARMA DISTRIBUZIONE, SpA  
NET & SONS, Srl  
Nestlé Nederland BV  
Deli XL  
Nutricia Cuijk BV  
Nestlé Portugal, S.A.  
Recheio - Cash and Carry, S.A.  
Makro - Cash & Carry Portugal, S.A.  
Continente Hipermercados, S.A.  
Centro Farmacéutico, S.A.  
Konfektyrsnabbgross Harry Persson AB  
Ljusdal & Färila fastighets AB  
Nestlé Sverige AB  
A D M Milling Ltd  
Clarks Wantage Ltd  
Fox's Biscuits  
H J Heinz & Co. Ltd  
H J Heinz & Co. Ltd  
Heinz (Farley Health Products)  
Johnson & Johnson Ltd

Spitz GesmbH, S.  
Coop Danmark A/S  
Oy Hartwall Ab  
Alko Oy  
Heineken Ireland  
Diageo Ireland  
Bavaria NV  
Heineken Nederland BV  
InBev Nederland NV  
Mitra C.V..  
Hansa Borg Bryggerier AS  
Ringnes AS  
Stabburet AS  
SCC - Sociedade Central de Cervejas e Bebidas, S.A. (Central de Cervejas)  
Molson Coors International Services Company  
Compañía Cervecera Canaria, S.A.  
Carlsberg Sverige AB  
Carlsberg Group Procurement AG  
Heineken Switzerland AG  
RAMSEIER Suisse AG

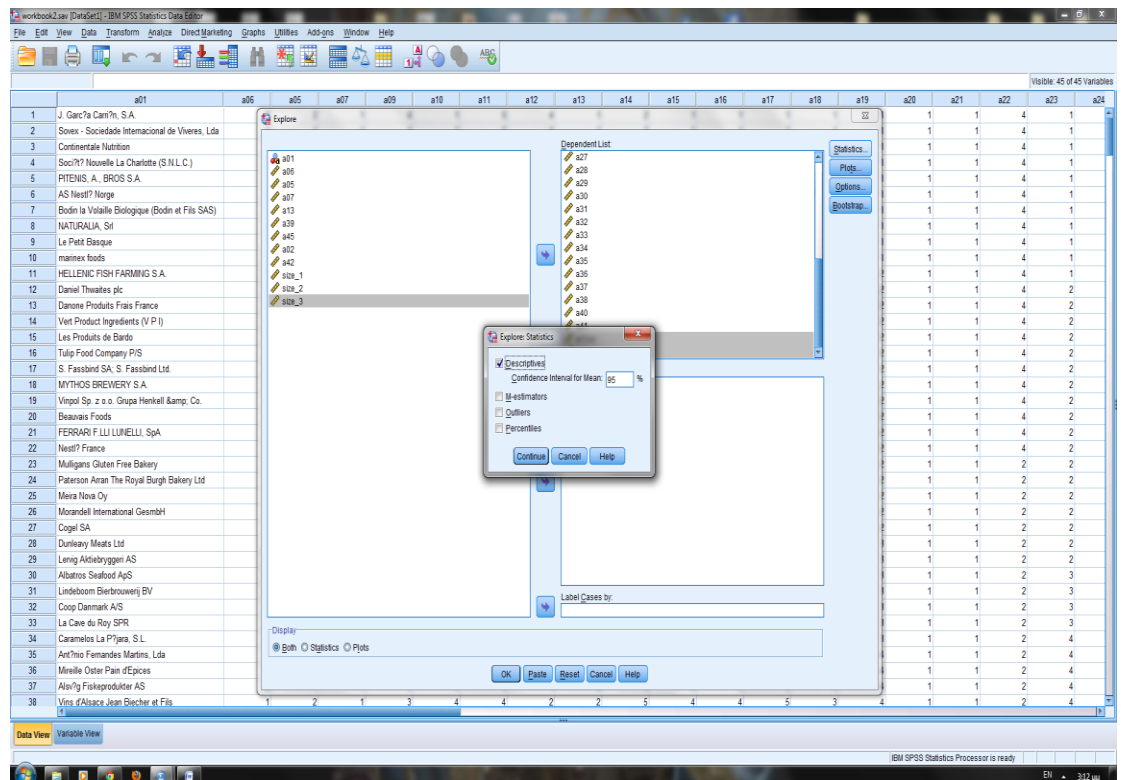
### **I.3 Normality test description**

Analyze – Descriptive Statistics – explore ->

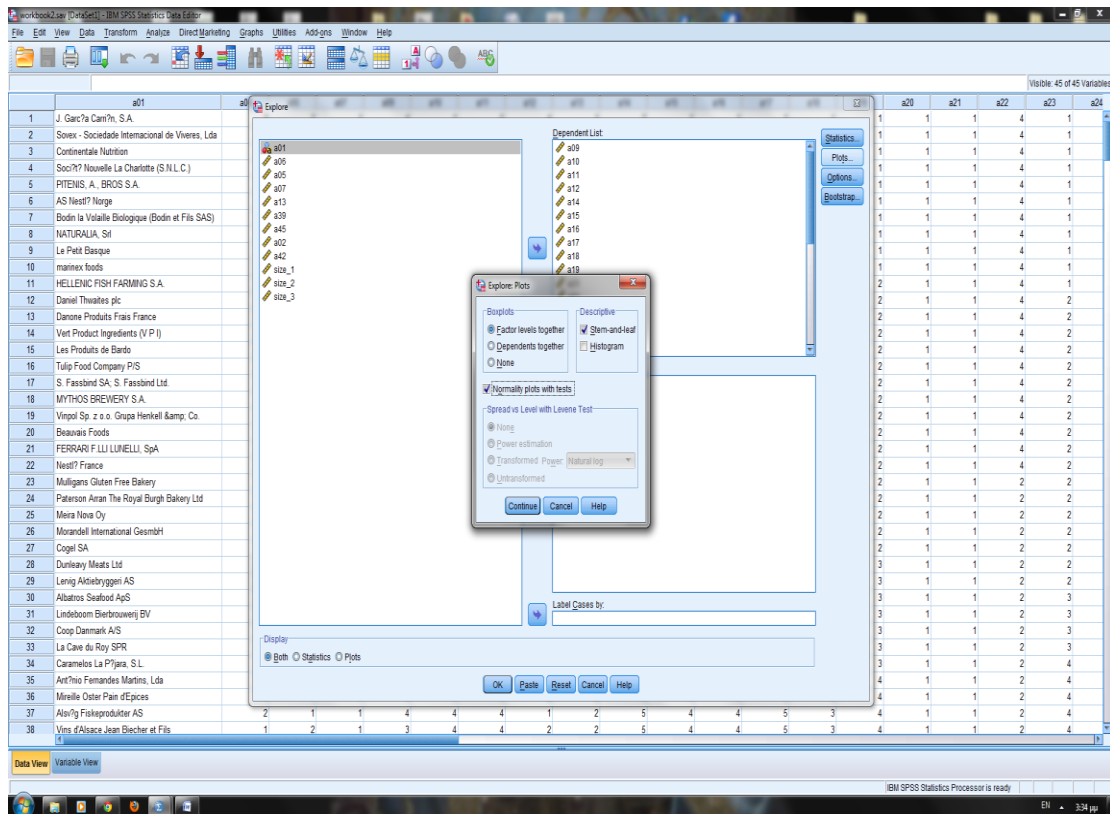
## Value Added Sustainable Procurement Customer's Perspective as perceived by companies : An Empirical Study of Western European Food and Beverage Companies.



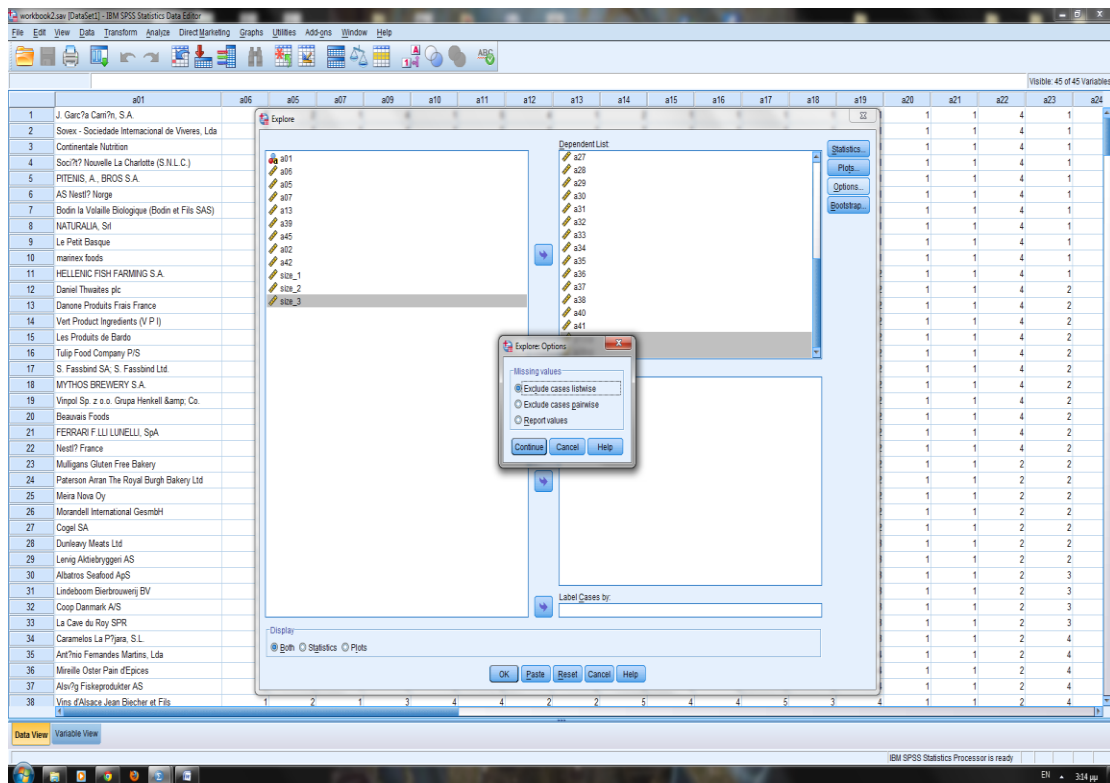
We use the default in the statistics options tab



We check the option for normality tests in the plots options tab

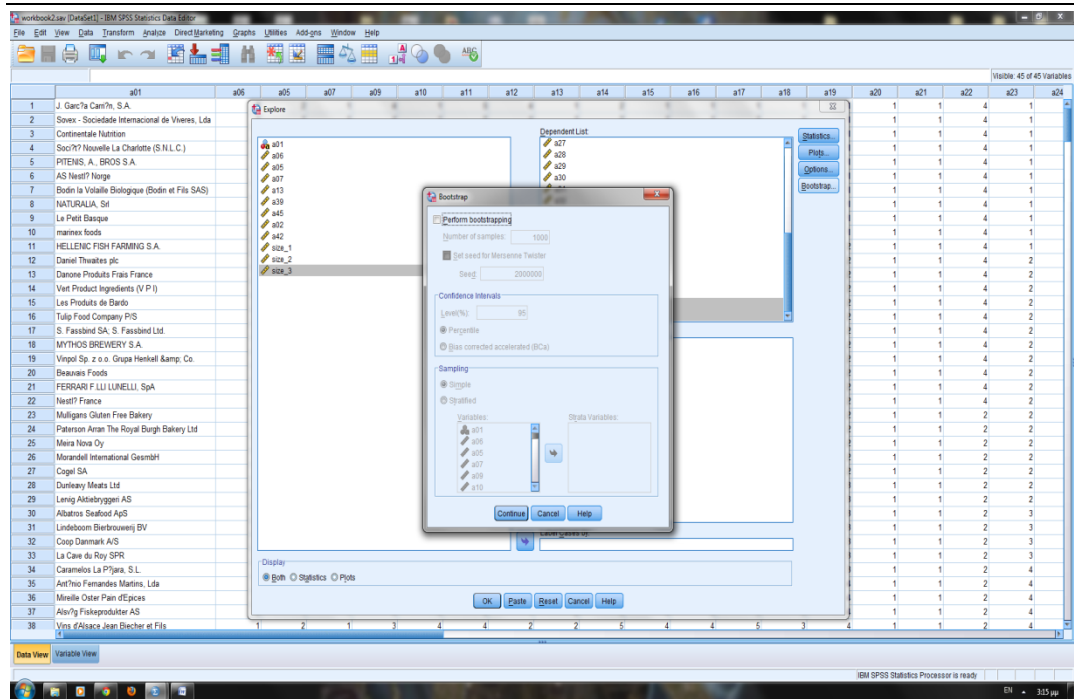


We use the default in the options tab

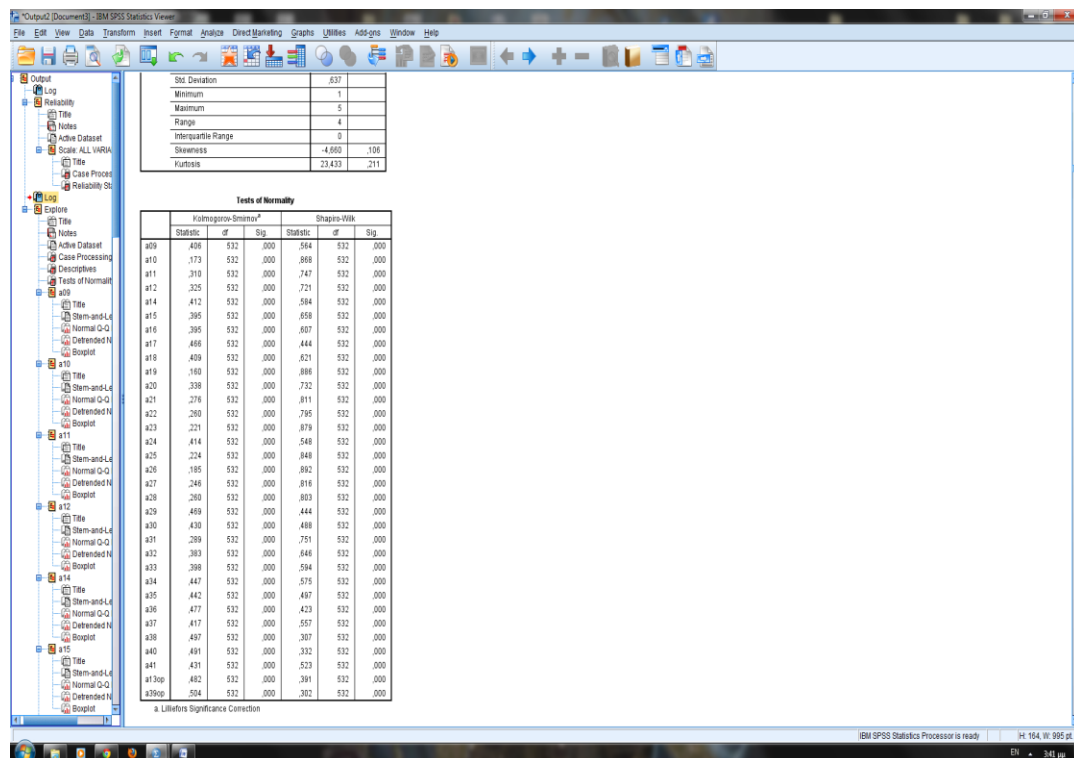


We use the default in the bootstrap tab

## Value Added Sustainable Procurement Customer's Perspective as perceived by companies : An Empirical Study of Western European Food and Beverage Companies.

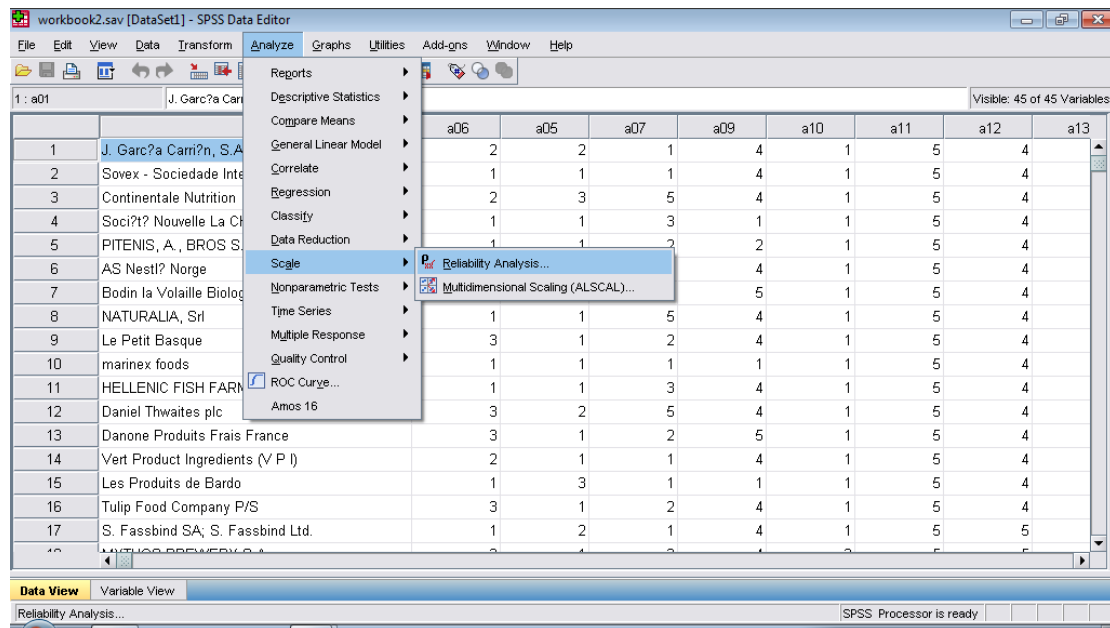


The SPSS output file amongst others generates a Tests of Normality Table



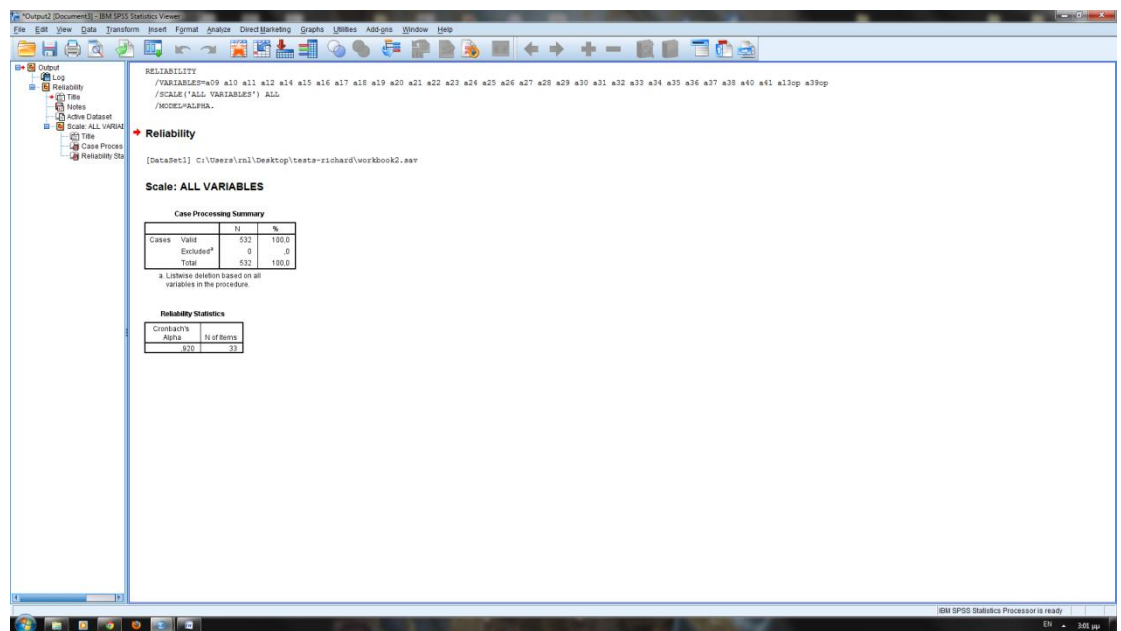
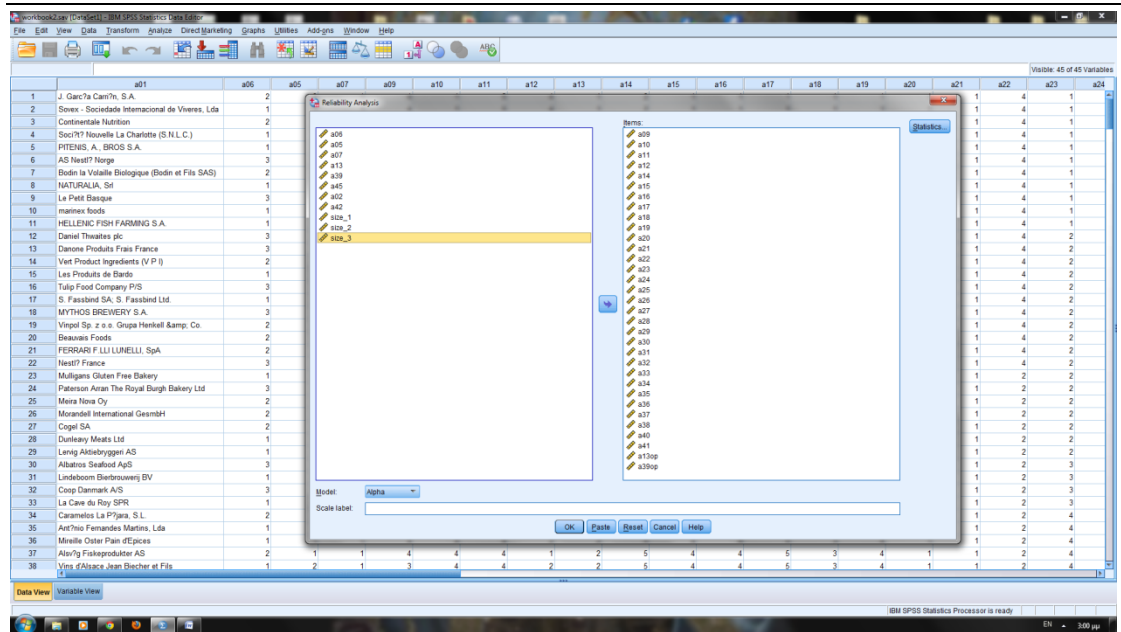
## I.4 Reliability test of the whole sample

We open our data file and the first thing we do is to make our variables compatible for analysis. Thus, we have to recode variables 13 and 39 into 13op and 39op due to the questions' opposite meaning. In order to verify the reliability of our questions model on our sample and our topic we used the Cronbach Alpha method.



In the reliability analysis process we exclude demographic questions and the optional question 45 (exclude questions 2, 5,6,7,42,45) and questions 13 and 39 that are rotated and the three switches size1,size2,size3 used to identify small, medium, large companies from our sample.

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RELIABILITY

/VARIABLES=a09 a10 a11 a12 a14 a15 a16 a17 a18 a19 a20 a21 a22 a23  
a24 a25 a26 a27 a28 a29 a30 a31 a32 a33 a34 a35 a36 a37 a38 a40 a41  
a13op a39op

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA.



## Reliability

[DataSet1] C:\Users\rnl\Desktop\tests-richard\workbook2.sav

### Scale: ALL VARIABLES

#### Case Processing Summary

		N	%
Cases	Valid	532	100,0
	Excluded <sup>a</sup>	0	,0
	Total	532	100,0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	N of Items
,920	33

## I.5 Factor analysis of the whole sample

### Factor Analysis

#### Descriptive Statistics

	Mean	Std. Deviation	Analysis N
a09	4,61	,732	532
a10	3,03	1,457	532
a11	4,22	1,032	532
a12	4,21	1,128	532
a14	4,62	,702	532

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a15	4,51	,773	532
a16	4,45	,990	532
a17	4,68	,813	532
a18	4,41	1,042	532
a19	3,31	1,336	532
a20	1,98	1,330	532
a21	2,28	1,381	532
a22	2,77	1,673	532
a23	3,55	,981	532
a24	4,60	,790	532
a25	3,90	1,072	532
a26	3,57	1,145	532
a27	4,06	1,018	532
a28	4,03	1,113	532
a29	4,69	,792	532
a30	4,61	,879	532
a31	4,26	,947	532
a32	4,50	,808	532
a33	4,49	,940	532
a34	4,63	,696	532
a35	4,61	,895	532
a36	4,65	,942	532
a37	4,37	1,242	532
a38	4,81	,653	532

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a40	4,78	,737	532
a41	4,66	,704	532
a13op	4,77	,652	532
a39op	4,82	,637	532

## I.6 KMO and Barlett's Sampling Adequacy Test

### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,938
Approx. Chi-Square		8573,621
Bartlett's Test of Sphericity	df	528
	Sig.	,000

**Kaiser-Meyer-Olkin Measure of Sampling Adequacy** - This measure varies between 0 and 1, and values closer to 1 are better. A value of .6 is a suggested minimum.

**Bartlett's Test of Sphericity** - This tests the null hypothesis that the correlation matrix is an identity matrix. An identity matrix is matrix in which all of the diagonal elements are 1 and all off diagonal elements are 0. We want to reject this null hypothesis.

Taken together, these tests provide a minimum standard which should be passed before a factor analysis (or a principal components analysis) should be conducted.

**Communalities**

	Initial	Extraction
a09	1,000	,359
a10	1,000	,624
a11	1,000	,666
a12	1,000	,583
a14	1,000	,499
a15	1,000	,539
a16	1,000	,630
a17	1,000	,685
a18	1,000	,489
a19	1,000	,497
a20	1,000	,749
a21	1,000	,687
a22	1,000	,719
a23	1,000	,548
a24	1,000	,721
a25	1,000	,551
a26	1,000	,454
a27	1,000	,583
a28	1,000	,519
a29	1,000	,692
a30	1,000	,733
a31	1,000	,635

a32	1,000	,503
a33	1,000	,633
a34	1,000	,560
a35	1,000	,695
a36	1,000	,559
a37	1,000	,754
a38	1,000	,559
a40	1,000	,551
a41	1,000	,439
a13op	1,000	,446
a39op	1,000	,732

Extraction Method: Principal Component Analysis.

### 1.8 Communalities

Communalities count the percentage of the variance of each variable “explained” by all the factors. In our sample, none communality is low, so all variables correlate with at least one factor.

#### Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10,719	32,480	32,480	7,182	21,763	21,763
2	3,211	9,729	42,209	4,092	12,399	34,162
3	2,122	6,431	48,640	3,083	9,341	43,503

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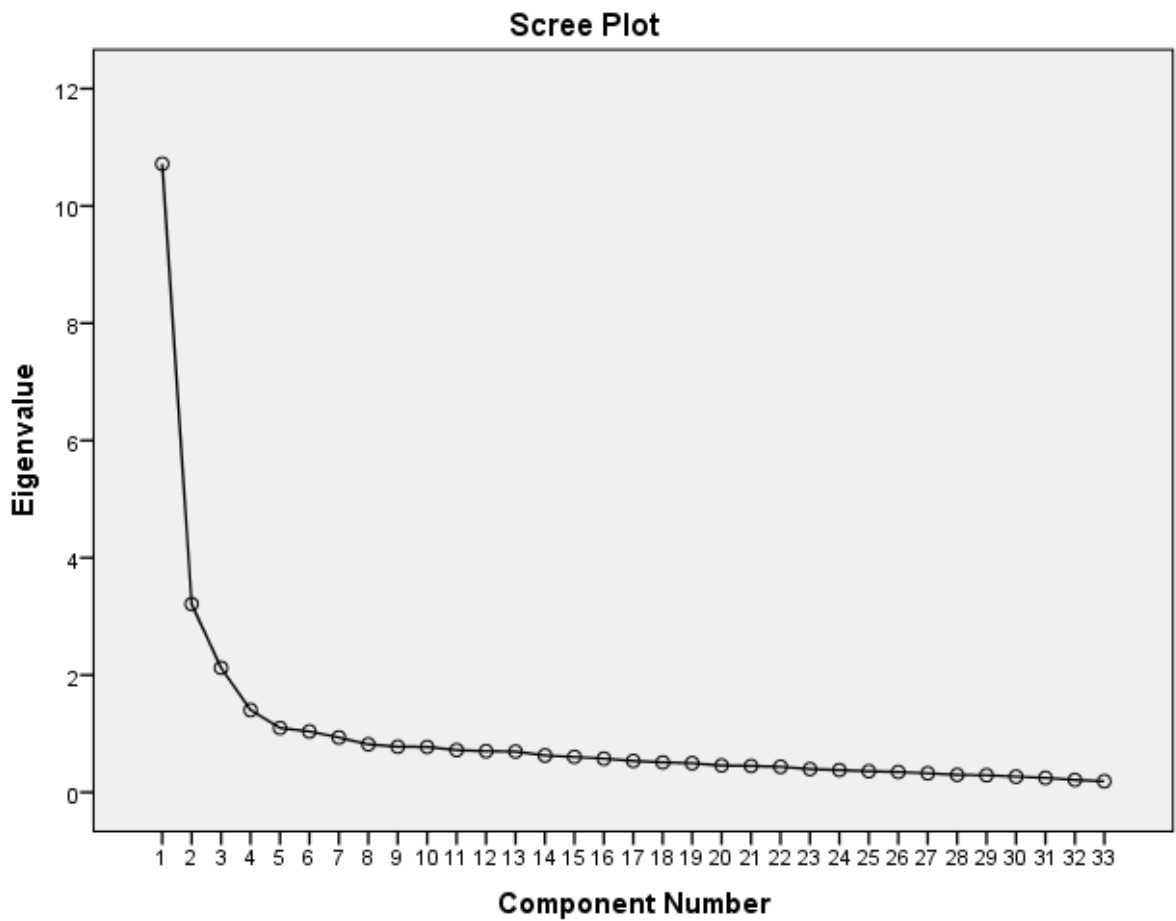
4	1,403	4,252	52,893	2,036	6,168	49,671
5	1,097	3,323	56,216	1,846	5,595	55,267
6	1,037	3,144	59,359	1,351	4,093	59,359
7	,935	2,834	62,194			
8	,817	2,477	64,671			
9	,777	2,355	67,026			
10	,773	2,344	69,369			
11	,720	2,183	71,552			
12	,701	2,125	73,677			
13	,695	2,106	75,782			
14	,628	1,903	77,686			
15	,604	1,829	79,515			
16	,575	1,742	81,257			
17	,535	1,620	82,877			
18	,510	1,546	84,423			
19	,497	1,505	85,928			
20	,457	1,385	87,313			
21	,448	1,358	88,671			
22	,435	1,319	89,990			
23	,395	1,196	91,186			
24	,379	1,149	92,335			
25	,358	1,085	93,421			
26	,346	1,050	94,471			
27	,324	,983	95,454			

---

28	,296	,897	96,351		
29	,291	,882	97,233		
30	,267	,809	98,042		
31	,246	,747	98,789		
32	,211	,641	99,430		
33	,188	,570	100,000		

Extraction Method: Principal Component Analysis.

### I.9 Scree Plot



The scree plot shows the eigen values for each component.

## I.10 Rotated Component Matrix

Rotated Component Matrix<sup>a</sup>

	Component					
	1	2	3	4	5	6
a17	,808					
a30	,805					
a24	,804					
a29	,763					
a35	,760					
a37	,727					
a16	,673					
a18	,670					
a33	,641					
a36	,585					
a28	,556					
a31	,553					
a15		,678				
a34		,627				
a14		,609				
a26		,598				
a27		,558				
a25		,525				
a23		,491				
a20			,836			



a21			,773			
a22			,710			
a10			,589			
a19			,566			
a11				,803		
a12				,704		
a09				,497		
a38					,740	
a32					,512	
a13op					,503	
a41					,468	
a39op						,833
a40						,587

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

On the above table we can observe the extract of the factor analysis after the Varimax rotation. This mode gives us the image of the group of 33 variables separated into 6 different categories, as well as the impact of its variable upon the factor, the factor loadings.

### I.11 Varimax with Kaiser Normalization Component Transformation Matrix

The Component Transformation Matrix Table shows the correlation between the factors after the rotation.

**Component Transformation Matrix**

Component	1	2	3	4	5	6
1	,760	,497	,304	,176	,194	,123
2	-,476	,443	,671	,090	-,268	-,216
3	-,204	-,267	,148	,781	,500	,066
4	,229	-,658	,632	-,202	-,159	,220
5	-,145	,155	-,115	,216	-,393	,861
6	-,284	,166	,151	-,513	,679	,381

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

### I.12 Reliability testing of the first part of variables

The first reliability test after the separation includes the first 15 variables from 09 to 23 (part 2 of the questionnaire).

**Case Processing Summary**

		N	%
Cases	Valid	532	100,0
	Excluded <sup>a</sup>	0	,0

Total	532	100,0
-------	-----	-------

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	N of Items
,825	15

The Cronbach's Alpha of 0,825 gives us the green light to continue, since it implies that our scale is viable. The column "Cronbach's Alpha if Item Deleted" shows us the reliability of the scale if we exclude each variable. The variable a13op would give us higher Alpha if deleted, preparing us about how we will move in the next analysis.

#### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a09	52,80	74,848	,399	,819
a10	54,39	63,688	,629	,801
a11	53,19	74,739	,260	,826
a12	53,21	71,837	,384	,819
a14	52,80	74,855	,419	,818
a15	52,90	73,382	,488	,815
a16	52,96	71,094	,502	,812
a17	52,73	74,397	,384	,819

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a18	53,00	72,689	,375	,819
a19	54,10	66,743	,546	,808
a20	55,44	65,346	,620	,802
a21	55,14	67,044	,508	,811
a22	54,64	64,766	,478	,816
a23	53,86	70,176	,566	,808
a13op	52,64	78,615	,121	,830

We continue with the first group of variables.

### I.13 Factor Analysis of the first part of variables

#### Descriptive Statistics

	Mean	Std. Deviation	Analysis N
a09	4,61	,732	532
a10	3,03	1,457	532
a11	4,22	1,032	532
a12	4,21	1,128	532
a14	4,62	,702	532
a15	4,51	,773	532
a16	4,45	,990	532
a17	4,68	,813	532
a18	4,41	1,042	532
a19	3,31	1,336	532
a20	1,98	1,330	532
a21	2,28	1,381	532
a22	2,77	1,673	532

a23	3,55	,981	532
a13op	4,77	,652	532

### I.14 Correlation Matrix

Correlation Matrix		a09	a10	a11	a12	a14	a15	a16	a17	a18	a19	a20	a21	a22	a23	a13op
Correlation	a09	<b>1,00</b>	,223	,242	,246	,215	,244	,336	,336	,315	,186	,194	,227	,094	,240	,181
	a10	,223	<b>1,00</b>	,136	,256	,345	,381	,339	,218	,187	,457	,458	,402	,569	,516	-,081
	a11	,242	,136	<b>1,00</b>	,435	,133	,096	,039	,059	,039	,130	,157	,122	,215	,020	,238
	a12	,246	,256	,435	<b>1,00</b>	,248	,226	,167	,084	,196	,167	,244	,192	,251	,136	,149
	a14	,215	,345	,133	,248	<b>1,00</b>	,464	,306	,248	,235	,264	,204	,116	,212	,324	-,022
	a15	,244	,381	,096	,226	,464	<b>1,00</b>	,431	,269	,218	,335	,244	,192	,298	,368	,000
	a16	,336	,339	,039	,167	,306	,431	<b>1,00</b>	,615	,471	,315	,215	,231	,077	,474	,155
	a17	,336	,218	,059	,084	,248	,269	,615	<b>1,00</b>	,548	,201	,159	,201	-,101	,348	,151
	a18	,315	,187	,039	,196	,235	,218	,471	,548	<b>1,00</b>	,145	,227	,223	-,034	,308	,211
	a19	,186	,457	,130	,167	,264	,335	,315	,201	,145	<b>1,00</b>	,478	,308	,448	,441	,030
	a20	,194	,458	,157	,244	,204	,244	,215	,159	,227	,478	<b>1,00</b>	,636	,553	,370	,072
	a21	,227	,402	,122	,192	,116	,192	,231	,201	,223	,308	,636	<b>1,00</b>	,362	,295	,089
	a22	,094	,569	,215	,251	,212	,298	,077	-,101	-,034	,448	,553	,362	<b>1,00</b>	,325	-,071
	a23	,240	,516	,020	,136	,324	,368	,474	,348	,308	,441	,370	,295	,325	<b>1,00</b>	,029
	a13op	,181	-,081	,238	,149	-,022	,000	,155	,151	,211	,030	,072	,089	-,071	,029	<b>1,00</b>

The correlation of a13op with the other variables is not so strong.

### I.15 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,833
	Approx. Chi-Square	2610,192
Bartlett's Test of Sphericity	df	105
	Sig.	,000

#### Communalities

	Initial	Extraction
a09	1,000	,410
a10	1,000	,643
a11	1,000	,691
a12	1,000	,610
a14	1,000	,601
a15	1,000	,590
a16	1,000	,687
a17	1,000	,710
a18	1,000	,604
a19	1,000	,495
a20	1,000	,754
a21	1,000	,670
a22	1,000	,734
a23	1,000	,566
a13op	1,000	,319

Extraction Method: Principal Component  
Analysis.

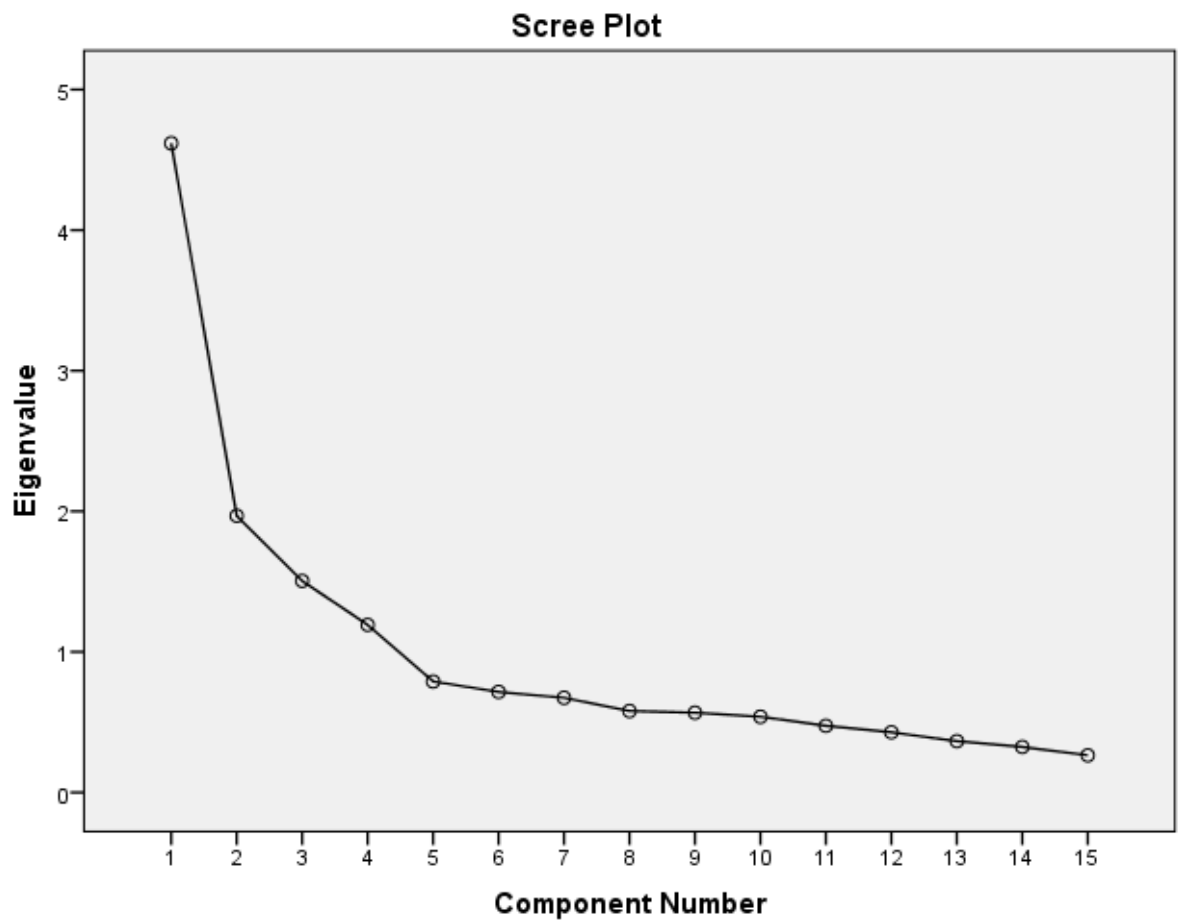
### I.16 Total Variance Explained

#### Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,618	30,787	30,787	2,978	19,851	19,851
2	1,968	13,117	43,904	2,614	17,427	37,279
3	1,505	10,035	53,938	1,976	13,171	50,450
4	1,192	7,946	61,884	1,715	11,434	61,884
5	,789	5,262	67,146			
6	,715	4,769	71,915			
7	,673	4,487	76,402			
8	,579	3,861	80,263			
9	,567	3,781	84,044			
10	,539	3,590	87,634			
11	,474	3,160	90,795			
12	,428	2,851	93,646			
13	,365	2,433	96,079			
14	,324	2,157	98,236			
15	,265	1,764	100,000			

Extraction Method: Principal Component Analysis.

### I.17 Scree Plot



### I.18 Rotated Component Matrix

Rotated Component Matrix<sup>a</sup>

	Component			
	1	2	3	4
a20	,847			
a21	,759			



a22	,736			
a10	,642			
a19	,610			
a23	,477			
a17		,826		
a18		,764		
a16		,734		
a09		,473		
a14			,725	
a15			,692	
a11				,824
a12				,725
a13op				,455

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

## I.19 Component Transformation Matrix

**Component Transformation Matrix**

Component	1	2	3	4
1	,667	,515	,466	,271
2	-,580	,812	-,057	-,019
3	-,085	-,063	-,351	,931
4	-,460	-,266	,811	,246

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

After examining the outputs, it is a fact that the question 13, even if reversed, is bothering us more than helping us. The reliability test could be better if we exclude it and also it is not highly related with the factor that it was categorized by the program. This probably derives from the opposite meaning of the question, which might confuse the responders. Trying to give a solution and produce better output, we decided to run another set of the same test with absence of the item 13op.

## I.20 Reliability Test if 13op Deleted

### Reliability test of the first half (if 13op is deleted)

#### Case Processing Summary

	N	%
Valid	532	100,0
Cases Excluded <sup>a</sup>	0	,0
Total	532	100,0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	N of Items
,830	14

Running again the reliability test we get a better Cronbach Alpha than before, as we expected.

#### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a09	48,03	73,193	,390	,824
a10	49,61	61,706	,646	,804
a11	48,42	73,231	,344	,822
a12	48,43	70,227	,376	,825
a14	48,02	73,007	,426	,823
a15	48,13	71,554	,495	,819
a16	48,19	69,466	,495	,817
a17	47,96	72,729	,377	,824
a18	48,23	71,148	,363	,825
a19	49,33	64,967	,551	,812
a20	50,66	63,644	,622	,806
a21	50,36	65,377	,507	,816
a22	49,87	62,783	,491	,820
a23	49,09	68,386	,571	,813

### I.21 Factor Analysis of the first part of variables (if 13op is deleted)

#### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,835
	Approx. Chi-Square	2523,640
Bartlett's Test of Sphericity	df	91
	Sig.	,000

The KMO and Bartlett's Test shows small improvement, yet significant by the absence of a13op.

**Communalities**

	Initial	Extraction
a09	1,000	,459
a10	1,000	,631
a11	1,000	,700
a12	1,000	,646
a14	1,000	,605
a15	1,000	,619
a16	1,000	,686
a17	1,000	,731
a18	1,000	,631
a19	1,000	,517
a20	1,000	,757
a21	1,000	,704
a22	1,000	,741
a23	1,000	,584

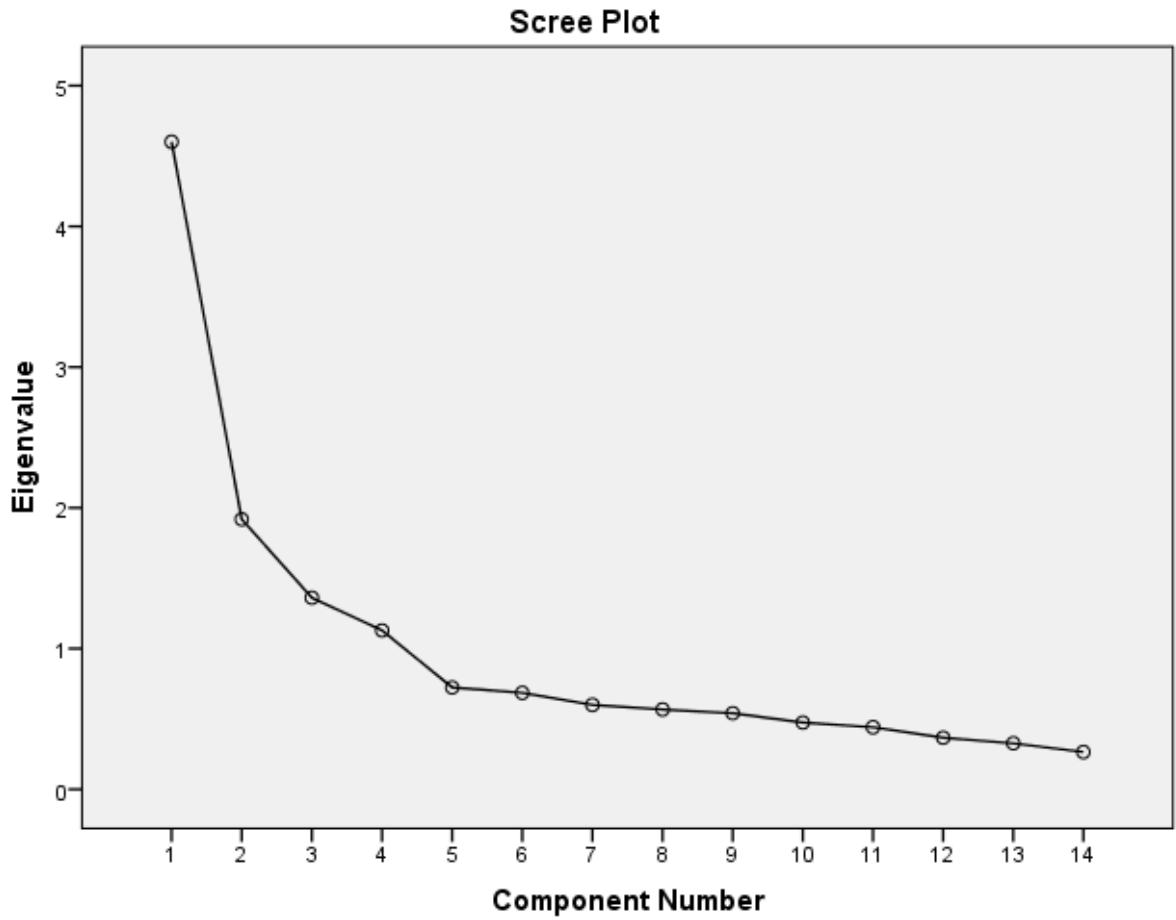
Extraction Method: Principal  
 Component Analysis.

**Total Variance Explained**

Component	Initial Eigenvalues	Rotation Sums of Squared Loadings
-----------	---------------------	-----------------------------------

	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,601	32,862	32,862	2,846	20,327	20,327
2	1,919	13,706	46,568	2,459	17,566	37,893
3	1,361	9,721	56,289	2,102	15,015	52,908
4	1,129	8,066	64,355	1,603	11,447	64,355
5	,724	5,169	69,525			
6	,686	4,897	74,422			
7	,600	4,285	78,707			
8	,567	4,052	82,758			
9	,541	3,861	86,619			
10	,474	3,388	90,007			
11	,441	3,151	93,158			
12	,367	2,618	95,776			
13	,327	2,334	98,110			
14	,265	1,890	100,000			

Extraction Method: Principal Component Analysis.



Rotated Component Matrix<sup>a</sup>

	Component			
	1	2	3	4
a20	,846			
a21	,771			
a22	,717			
a10	,618			
a19	,583			
a17		,837		
a18		,781		
a16		,707		

a09		,510		
a15			,739	
a14			,735	
a23			,490	
a11				,832
a12				,763

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

#### Component Transformation Matrix

Component	1	2	3	4
1	,642	,490	,528	,262
2	-,574	,794	,058	-,193
3	-,318	,006	-,087	,944
4	,396	,361	-,843	,053

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

#### Component Score Coefficient Matrix

	Component			
	1	2	3	4
a09	-,032	,217	-,089	,255
a10	,175	-,070	,174	-,047
a11	-,056	-,039	-,062	,566
a12	-,058	-,022	,024	,496

Value Added Sustainable Procurement Customer's Perspective as perceived by companies :  
An Empirical Study of Western European Food and Beverage Companies.

a14	-,173	-,068	,460	,071
a15	-,109	-,052	,436	-,006
a16	-,049	,268	,119	-,086
a17	-,054	,381	-,047	-,051
a18	-,008	,369	-,137	,021
a19	,182	-,056	,139	-,089
a20	,373	,024	-,199	-,003
a21	,374	,126	-,332	,000
a22	,258	-,238	,115	,040
a23	,103	,067	,186	-,184

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

## I.22 Factors of The First Part Explained

Factors of the first part explained

### Factor 1a: Innovation and Measurement

a20	Your company teams with organizations in performing research to learn about consumers through market surveys and interviews and to develop future products.	,846
a21	Your company procurement function cooperates with competitors in setting common standards of supplies requirements to achieve discounts.	,771
a22	Your company has a Total Quality Management (TQM) Program or Quality culture in place, invests in Innovation Research, and has reduced costs and improved operations.	,717
a10	Your company has tools/metrics which an auditor could use to measure/verify the implementation of the Environmental Policy	,618
a19	Your company innovates and is a thought leader with Research and Development (R&D) which contributes to best practices and standards in the Market.	,583



**Reliability Statistics**

Cronbach's Alpha	N of Items
,812	5

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a21	11,09	20,971	,535	,794
a20	11,39	19,606	,702	,747
a22	10,59	17,933	,629	,769
a10	10,34	19,570	,617	,770
a19	10,06	21,244	,537	,793

**Factor 1b: Company sustainable profile**

a17	Annual Stockholder Meetings/Owners have supported your board's long term Environmental Strategy and Policy.	,837
a18	Your competition endorses and practices Ethical Business Practices	,781
a16	The Press has regarded favorably your Environmental policy initiatives.	,707
a09	Your company has published an Environmental Policy describing its mission	,510

**Reliability Statistics**

Cronbach's Alpha	N of Items
,755	4

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a17	13,48	4,540	,669	,640
a18	13,75	4,053	,567	,695
a16	13,71	4,095	,611	,663
a09	13,55	5,619	,394	,752

**Factor 1c: Company's positive sustainable image**

a15	Your Environmental Policy by its implementation has resulted in less Lawsuits.	,739
a14	Your Environmental achievements have improved your brand(s) image and strengthened customer loyalty.	,735
a23	Your company is a preferred employer for experienced professionals and graduates and has a sustainable family culture. Employees that deliver exceptional customer service, and top quality products and services are rewarded.	,490

**Reliability Statistics**

Cronbach's Alpha	N of Items
,635	3

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a15	8,17	1,904	,498	,470
a14	8,07	2,118	,465	,527
a23	9,13	1,593	,406	,632

**Factor 1d: Supplier sustainability management**

a11	Suppliers are contractually required to abide to your Environmental Policy.	,832
a12	Suppliers' compliance with your Environmental Policy is verified yearly and cooperation or verification measures are in place to guarantee conformity.	,763

**Reliability Statistics**

Cronbach's Alpha	N of Items
,604	2

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a11	4,21	1,272	,435	.
a12	4,22	1,066	,435	.

## I.23 Reliability testing of the second part of variables

### Case Processing Summary

		N	%
Cases	Valid	532	100,0
	Excluded <sup>a</sup>	0	,0
	Total	532	100,0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
,907	18

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a24	75,45	91,476	,736	,898
a25	76,16	90,166	,585	,902
a26	76,49	91,546	,473	,906
a27	75,99	90,891	,582	,902
a28	76,02	88,171	,661	,899
a29	75,36	92,085	,691	,899
a30	75,44	89,882	,754	,897
a31	75,80	89,431	,721	,898

a32	75,55	95,156	,470	,905
a33	75,56	89,607	,716	,898
a34	75,42	96,071	,489	,904
a35	75,45	89,717	,750	,897
a36	75,41	93,003	,514	,904
a37	75,69	85,375	,710	,898
a38	75,24	100,319	,190	,909
a40	75,28	97,007	,391	,907
a41	75,39	96,650	,439	,905
a39op	75,23	99,858	,233	,910

## I.24 Factor Analysis of the second part of variables

### Descriptive Statistics

	Mean	Std. Deviation	Analysis N
a24	4,60	,790	532
a25	3,90	1,072	532
a26	3,57	1,145	532
a27	4,06	1,018	532
a28	4,03	1,113	532
a29	4,69	,792	532
a30	4,61	,879	532
a31	4,26	,947	532
a32	4,50	,808	532

Value Added Sustainable Procurement Customer's Perspective as perceived by companies :  
An Empirical Study of Western European Food and Beverage Companies.

a33	4,49	,940	532
a34	4,63	,696	532
a35	4,61	,895	532
a36	4,65	,942	532
a37	4,37	1,242	532
a38	4,81	,653	532
a40	4,78	,737	532
a41	4,66	,704	532
a39op	4,82	,637	532

Correlation Matrix		a24	a25	a26	a27	a28	a29	a30	a31	a32	a33	a34	a35	a36	a37	a38	a40	a41	a39 op
Correlation	a24	1,00	,439	,286	,446	,545	,641	,701	,560	,302	,617	,331	,677	,444	,634	,098	,365	,324	,164
	a25	,439	1,00	,547	,525	,478	,417	,444	,571	,263	,392	,354	,473	,207	,339	,075	,214	,199	,062
	a26	,286	,547	1,00	,507	,400	,302	,313	,446	,265	,336	,322	,340	,131	,235	,038	,188	,182	,078
	a27	,446	,525	,507	1,00	,439	,429	,461	,568	,300	,485	,365	,425	,202	,329	,035	,177	,256	,032
	a28	,545	,478	,400	,439	1,00	,505	,514	,544	,345	,486	,354	,526	,319	,577	,071	,234	,289	,160
	a29	,641	,417	,302	,429	,505	1,00	,739	,510	,249	,572	,368	,631	,406	,521	,125	,372	,252	,127
	a30	,701	,444	,313	,461	,514	,739	1,00	,559	,286	,592	,358	,676	,473	,627	,110	,436	,324	,187
	a31	,560	,571	,446	,568	,544	,510	,559	1,00	,409	,557	,455	,607	,334	,472	,114	,247	,303	,132
	a32	,302	,263	,265	,300	,345	,249	,286	,409	1,00	,450	,309	,311	,306	,382	,185	,158	,370	,100
	a33	,617	,392	,336	,485	,486	,572	,592	,557	,450	1,00	,496	,581	,400	,540	,215	,282	,330	,143
a34	,331	,354	,322	,365	,354	,368	,358	,455	,309	,496	1,00	,379	,167	,286	,152	,156	,204	,083	

<b>a35</b>	,677	,473	,340	,425	,526	,631	,676	,607	,311	,581	,379	<b>1,00</b>	,454	,643	,107	,372	,324	,199
<b>a36</b>	,444	,207	,131	,202	,319	,406	,473	,334	,306	,400	,167	,454	<b>1,00</b>	,582	,211	,274	,359	,244
<b>a37</b>	,634	,339	,235	,329	,577	,521	,627	,472	,382	,540	,286	,643	,582	<b>1,00</b>	,263	,328	,439	,284
<b>a38</b>	,098	,075	,038	,035	,071	,125	,110	,114	,185	,215	,152	,107	,211	,263	<b>1,00</b>	,027	,195	,070
<b>a40</b>	,365	,214	,188	,177	,234	,372	,436	,247	,158	,282	,156	,372	,274	,328	,027	<b>1,00</b>	,115	,261
<b>a41</b>	,324	,199	,182	,256	,289	,252	,324	,303	,370	,330	,204	,324	,359	,439	,195	,115	<b>1,00</b>	,240
<b>a39 op</b>	,164	,062	,078	,032	,160	,127	,187	,132	,100	,143	,083	,199	,244	,284	,070	,261	,240	<b>1,00</b>

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,933
Approx. Chi-Square		4454,078
Bartlett's Test of Sphericity	df	153
	Sig.	,000

**Communalities**

	Initial	Extraction
a24	1,000	,695
a25	1,000	,603
a26	1,000	,540
a27	1,000	,610
a28	1,000	,526
a29	1,000	,652
a30	1,000	,751
a31	1,000	,658
a32	1,000	,515

Value Added Sustainable Procurement Customer's Perspective as perceived by companies :  
An Empirical Study of Western European Food and Beverage Companies.

a33	1,000	,610
a34	1,000	,414
a35	1,000	,693
a36	1,000	,559
a37	1,000	,717
a38	1,000	,458
a40	1,000	,446
a41	1,000	,491
a39op	1,000	,275

Extraction Method: Principal Component Analysis.

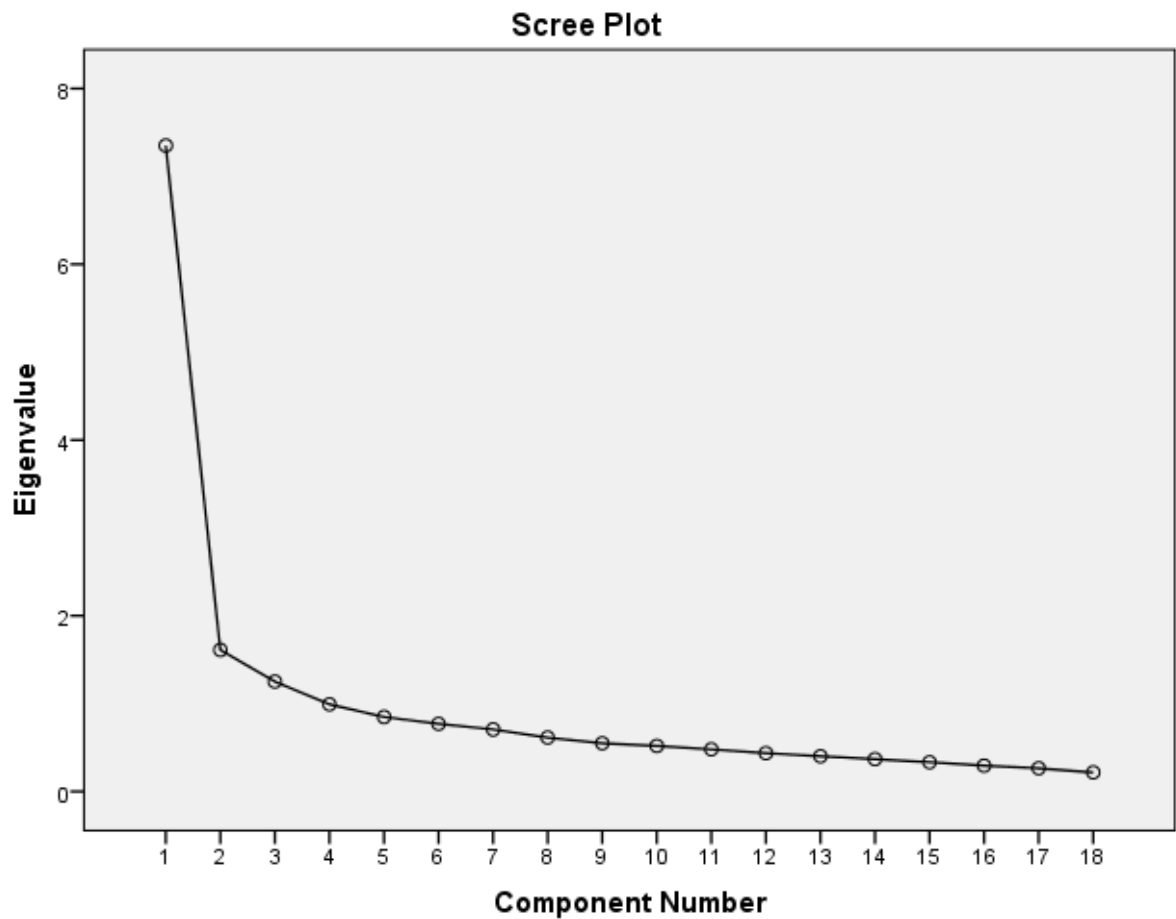
**Total Variance Explained**

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,352	40,844	40,844	4,238	23,546	23,546
2	1,611	8,950	49,793	3,983	22,127	45,672
3	1,250	6,947	56,740	1,992	11,068	56,740
4	,992	5,508	62,248			
5	,848	4,708	66,957			
6	,769	4,275	71,231			
7	,706	3,921	75,153			
8	,613	3,406	78,559			
9	,548	3,046	81,605			
10	,519	2,881	84,486			
11	,479	2,661	87,147			



12	,436	2,423	89,569		
13	,401	2,230	91,799		
14	,368	2,044	93,843		
15	,333	1,850	95,694		
16	,294	1,632	97,326		
17	,264	1,469	98,794		
18	,217	1,206	100,000		

Extraction Method: Principal Component Analysis.



**Rotated Component Matrix<sup>a</sup>**

	Component		
	1	2	3
a27	,762		
a25	,753		
a26	,734		
a31	,709		
a28	,564		
a33	,540		
a30		,740	
a24		,693	
a37		,674	
a35		,669	
a29		,666	
a40		,653	
a36		,602	
a39op		,473	
a38			,677
a41			,637
a32			,597
a34			,580

Extraction Method: Principal Component  
 Analysis. Rotation Method: Varimax with Kaiser  
 Normalization.

a. Rotation converged in 6 iterations.

**Component Transformation Matrix**

Component	1	2	3
1	,677	,657	,331
2	-,725	,520	,452
3	,125	-,546	,829

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Because we used an orthogonal rotation, this should be a diagonal matrix, meaning that the same number should appear in all three places along the diagonal. In actuality the factors are uncorrelated; however, because factor scores are estimated and there may be slight correlations among the factor scores.

**I.25 Reliability test of the first half (if 39op is deleted)****Case Processing Summary**

		N	%
Cases	Valid	532	100,0
	Excluded <sup>a</sup>	0	,0
	Total	532	100,0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
,910	17

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
a24	70,63	88,272	,739	,901
a25	71,33	86,882	,592	,904
a26	71,67	88,291	,476	,909
a27	71,17	87,563	,591	,904
a28	71,20	85,029	,662	,902
a29	70,54	88,844	,695	,902
a30	70,62	86,722	,755	,899
a31	70,97	86,222	,725	,900
a32	70,73	91,890	,472	,907
a33	70,74	86,409	,719	,900
a34	70,60	92,776	,492	,907
a35	70,62	86,574	,750	,899
a36	70,58	89,927	,506	,907
a37	70,86	82,456	,703	,901
a38	70,42	97,008	,188	,913
a40	70,45	93,883	,380	,910
a41	70,57	93,496	,431	,908

Now our scale has the optimum alpha score.

## I.26 Factor Analysis of the second part of variables (if 39op is deleted)

### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,935
	Approx. Chi-Square	4369,729
Bartlett's Test of Sphericity	df	136
	Sig.	,000

KMO and Bartlett's Test is also better than the previous one.

### Communalities

	Initial	Extraction
a24	1,000	,710
a25	1,000	,619
a26	1,000	,598
a27	1,000	,613
a28	1,000	,527
a29	1,000	,667
a30	1,000	,764
a31	1,000	,660
a32	1,000	,517
a33	1,000	,613
a34	1,000	,415
a35	1,000	,698
a36	1,000	,573
a37	1,000	,722

Value Added Sustainable Procurement Customer's Perspective as perceived by companies :  
 An Empirical Study of Western European Food and Beverage Companies.

a38	1,000	,474
a40	1,000	,416
a41	1,000	,476

Extraction Method: Principal Component Analysis.

**Total Variance Explained**

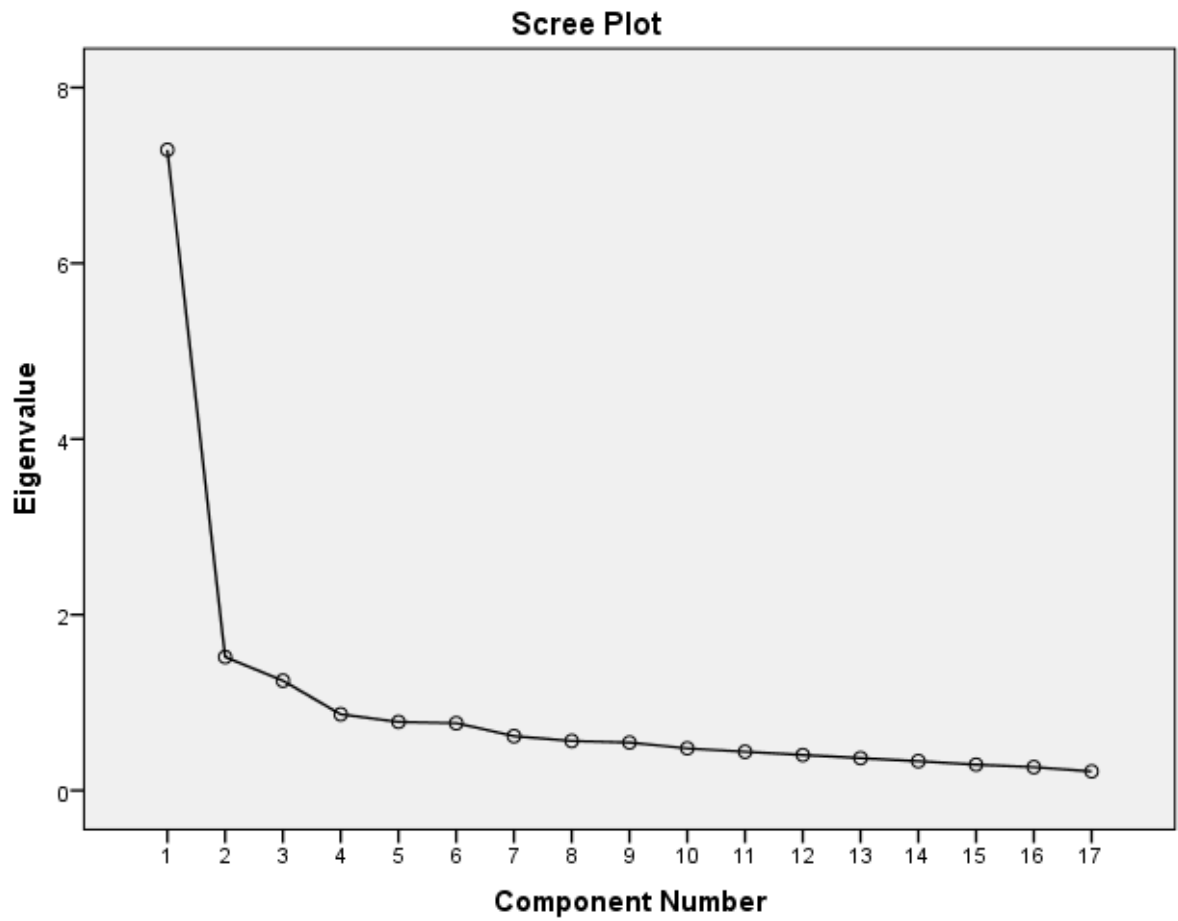
Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,292	42,893	42,893	4,301	25,298	25,298
2	1,519	8,935	51,828	3,674	21,609	46,907
3	1,249	7,350	59,177	2,086	12,270	59,177
4	,866	5,097	64,274			
5	,780	4,588	68,862			
6	,765	4,503	73,365			
7	,618	3,634	76,999			
8	,564	3,315	80,314			
9	,545	3,206	83,520			
10	,479	2,818	86,338			
11	,440	2,588	88,926			
12	,404	2,377	91,303			
13	,369	2,168	93,471			
14	,333	1,961	95,432			
15	,294	1,729	97,162			
16	,265	1,561	98,722			

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17	,217	1,278	100,000		
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Extraction Method: Principal Component Analysis.



**Rotated Component Matrix<sup>a</sup>**

	Component		
	1	2	3
a30	,794		
a24	,750		
a29	,733		
a35	,718		
a37	,683		
a40	,635		
a36	,593		
a33	,500		
a26		,770	
a25		,743	
a27		,743	
a31		,671	
a28		,522	
a38			,687
a41			,636
a32			,605
a34			,570

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.



**Component Transformation Matrix**

Component	1	2	3
1	,705	,612	,357
2	,414	-,765	,494
3	-,576	,201	,793

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

**Component Score Coefficient Matrix**

	Component		
	1	2	3
a24	,218	-,035	-,063
a25	-,068	,285	-,108
a26	-,157	,343	-,076
a27	-,088	,285	-,067
a28	,046	,114	-,011
a29	,225	-,022	-,115
a30	,246	-,045	-,094
a31	-,024	,197	,005
a32	-,165	,097	,358
a33	,036	,063	,118
a34	-,124	,208	,099
a35	,191	-,008	-,053
a36	,179	-,199	,206
a37	,169	-,124	,172

Value Added Sustainable Procurement Customer's Perspective as perceived by companies :  
An Empirical Study of Western European Food and Beverage Companies.

a38	-,133	-,075	,474
a40	,290	-,119	-,198
a41	-,069	-,034	,377

Extraction Method: Principal Component  
Analysis.

Rotation Method: Varimax with Kaiser  
Normalization.

## I.27 Factor Analysis of the Second Part

### Factor 2a: Customer's Driven Packaging Label(sustainability impact)

A30	Reduced or Recycled Packaging or use of more environmental friendly packaging material and shape are preferred by customers.	,794
A24	As a procurement officer or senior management professional do you understand "sustainable value procurement" (SVP).	,750
A29	Packaging or labeling BIO or other local traditional or Fair Trade quality standard claims and green colors are preferred by customers.	,733
A35	Independently Surveyed Customers share common environmental values.	,718
A37	Customer's choice is influenced in their purchasing decisions by your Environmental policy and SVP initiatives.	,683
A40	Special certified labels such as: Bio, Organic, Max Havelaar, Product of ...(region), All Natural, Traditional, etc, are preferred by customers	,635
A36	Legislation favors SVP conformity in Packaging and Product Labels.	,593
A33	Stock Market and Investors report favorably on our company's environmental initiatives.	,500

#### Reliability Statistics

Cronbach's Alpha	N of Items
,894	8

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a30	32,19	23,093	,800	,868
a24	32,20	24,026	,772	,872
a29	32,11	24,356	,722	,877
a35	32,19	23,251	,762	,872
a37	32,43	20,792	,732	,878
a40	32,02	26,798	,431	,889
a36	32,15	24,472	,565	,890
a33	32,30	23,662	,665	,881

**Factor 2b: Implementation of SVP Strategy**

A26	Suppliers involved in the procurement process been trained in SVP.	,770
A25	Employees involved in the procurement process been trained in SVP.	,743
A27	Marketing has taken advantage of SVP to enhance the brand image on the packaging.	,743
A31	Your SVP product initiatives have resulted in increased Sales.	,671
A28	Advertising has taken advantage of some SVP message to enhance the brand image and sales with customers.	,522

**Reliability Statistics**

Cronbach's Alpha	N of Items
,832	5

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a26	16,25	11,000	,594	,810
a25	15,92	10,883	,677	,784
a27	15,76	11,371	,643	,794
a31	15,56	11,561	,678	,787
a28	15,79	11,284	,575	,814

**Factor 2c: SVP Customer Value**

A38	Customers are willing to pay something extra for an environmental/social friendlier choice.	,687
A41	Competitors that practice SVP are preferred by customers and do well for those SVP products.	,636
A32	Non Governmental Organizations (NGO's) report favorably on our company's environmental claims.	,605
A34	Consumer Advocacy Groups (CAG's) report favorably on our company's environmental initiatives.	,570

**Reliability Statistics**

Cronbach's Alpha	N of Items
,617	4

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
a38	13,80	2,602	,243	,588
a41	13,95	2,246	,379	,455
a32	14,11	1,924	,430	,403
a34	13,98	2,371	,320	,503