Social and Economic Perspectives on Sustainability

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The term "Sustainability" possesses numerous meanings for different people and various circumstances and it is a common mistake to define sustainability strictly in terms of "environmental sustainability". This misconception believes the major flaw of the contemporary pattern of development is simply its destruction of the environment. Handling "sustainability" only from an environmental standpoint is a superficial view that needs to be assessed carefully and underlined correctly. As A. D. Basiago suggests, "…[t]he protection of natural systems represents not an overarching panacea for achieving economic vitality and social justice, but a necessary component of an entire system for achieving economic, social and environmental 'sustainability', in which economic reforms and social reforms are as important."

The chapters included in this volume are composed of some selected significant contributions from the first International Sustainability Congress organized by International Center of Sustainability (ICS), 1-3 December 2016, in Istanbul, Turkey. All chapters are peer-reviewed by both the editors and at least two independent scholars from fields relevant to the manuscript's subject area. ICS is a research and academic center for sustainability founded in 2015 and dedicated to build resilience of communities and ecosystems to environmental and socio-economic risks. ICS has an integrated approach and specifies sustainability not only from an environmental point of view but also in terms of socio-economic process. Its mission is to produce information as well as enhance research and practice at Micro and Macro levels in Sustainable Development with a holistic and a cross-disciplinary approach.

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SOCIAL AND ECONOMIC PERSPECTIVES ON SUSTAINABILITY

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Introduction
Social and Economic Perspectives
on Sustainability

M. Mustafa Erdoğdu
Aslı Yüksel Mermod
Olcay Bige Aşkun Yıldırım

The term "sustainability" possesses numerous meanings for different people and various circumstances. But, the core meaning of sustainability is the responsible use of resources. Sustainability can be broadly defined as 'meeting the needs of the present generation without compromising the ability of future generations to meet their own needs' (WCED, 1987). There are three interconnected spheres of sustainability: social, economic, and environmental. When the concepts contained in the three spheres of sustainability are applied to real world situations, the quality of life for all is improved, natural resources are preserved and the environment is protected.

It is a common mistake to define sustainability strictly in terms of "environmental sustainability". This misconception believes the major flaw of the contemporary pattern of development is simply its destruction of the environment. Handling "sustainability" only from an environmental standpoint is a superficial view that needs to be assessed carefully and underlined correctly. As Basiago (1999: 155) suggests, '…[t]he protection of natural systems represents not an overarching panacea for achieving economic vitality and social justice, but a necessary component of an entire system for achieving economic, social and environmental "sustainability", in which economic reforms and social reforms are as important.'

The sustainability challenge is to overcome a vast array of market, policy and institutional failures and in addition to natural and environmental pollution, sustainability combine all the social, political, and economic encounters faced by humanity. The multi dimensional phenomenon of sustainability lies at the heart of the challenge of environment and development and the way governments, business and environmental groups respond to it. Sustainability is a multidimensional term both in term of its indicators and determinants

(Markulev & Long, 2013). This volume of gathered chapters will particularly focus on social and economic sustainability.

Social sustainability is based on the concept that a decision or action promotes the betterment of society. This social concept encompasses many things such as human rights, environmental law, and public involvement and participation. Economic sustainability, on the other hand, is the term used to identify various strategies that promote the use of resources in such a way that it is both efficient and responsible, and likely to provide long-term benefits.

The chapters included in this volume are composed of some selected significant contributions from the first International Sustainability Congress organized by International Center of Sustainability (ICS), 1-3 December 2016, in Istanbul, Turkey. All chapters are peer-reviewed by both the editors and at least two independent scholars from fields relevant to the manuscript's subject area. The chapters have a balance between the discussion of theory and policy and are written in an accessible and engaging style. All chapters offer a nuanced interpretation of the scholarly literature on the environmental impact of globalization, trade, finance, and production. While maintaining academic rigour, the chapters are written in such a way that they can be understood by non-academics and non-specialists and will be appealing to general public. The chapters in this book mainly seek to explain the developments in green policy and politics to understand the key challenges.

In the 2nd chapter written by Raya Tsvetkova and Savina Ezekieva, the purpose of the study is to analyze the culture of sustainability. Sustainability culture has a strong impact on all facets of life and business, and it is proving to be the way of the future. The authors interrogate what differentiates a sustainable culture and if the culture of sustainability a fostering environment for social and commercial innovation by using case studies and their personal research. The authors collect previously gathered data and cases, implications to draw the introduction of policies, which can help sustainability culture exist and flourish.

In the 3rd chapter, Caroline Duvier and Crina Oltean-Dumbrava focuses on measuring the impact of building materials on the environment, but also their sustainability in terms of life cycle performance and cost, largely depends on how well data is recorded for these materials. In a case study on a social housing provider in the UK, results show that many variables needed to assess the sustainability and environmental impact of building materials are missing. Sustainability is a large part of this obligation, particularly for future generations. Social housing providers will be able to focus on providing sustainable, high quality housing, integrating innovation and creativity.

In the 4th chapter, Dilek Akbaş Akdoğan scrutinizes the Renewable Energy Policy of European Union. Her study defines renewable sources and its status in EU. The objectives and the measures that the EU has set for member countries in the field of renewable energy are explained. Determinated targets in the field of renewables for 2020 and 2030 by the Directives of European Commission are discussed and the steps and the efforts taken in achieving the goals of 2020 and 2030 are evaluated. Support schemes for the development of

renewable energy in EU are briefly explained. Legal Framework of EU renewable energy policy, applied policies, developments and problems encountered in this field are analyzed and recommendations are given.

In the 5th chapter, M. Mustafa Erdoğdu and Coşkun Karaca sought an ideal solution for an industrial policy for Turkey to make use of its solar energy potential to raise national income and decrease unemployment. The authors underline persistently that the creation of a domestic solar energy manufacturing industry in Turkey would not only help to create a low-carbon economy and cleaner environment, but also increase the security of energy supply by reducing the dependence on imported oil and gas, for this target the need of governments to intervene and provide "policy rents" for sustainable investments while withdrawing rents from polluting investments is highlightened. The paper acknowledges numerous opportunities that Turkey's solar energy potential may bring and the accrual of the national income and employment which will be provided by solar energy investments is estimated through JEDI (Jobs and Economic Development Impact) method promoted by NREL (National Renewable Energy Laboratory) in the US to ensure realistic results from the analysis.

In the 6th chapter, Övünç Gürsoy highlights how the role of a bank in supporting a green economy can be improved in an environment where banks are challenged by Basel III requirements. Basel standards do not differentiate green loans from other corporate loans in terms of risk weightings. The author argues that Basel III requirements discourage financing sustainable economic activities. Sekerbank, which pioneered Turkey's first microfinance lending model, is examined as a case study. The bank's capacity to expand financing for green projects after Basel III implementation is focused. The findings show that if risk weightings of green loans were dropped to 50% from 100%, Sekerbank's capital adequacy ratio (CAR) would be 4 percentage points higher. The chapter suggests that risk weightings of green loans should be relaxed in order to encourage sustainable development.

In the 7th chapter, Semra F. Aşcıgil, Uğur Soytaş, Meltem Ö. Özcanlı emphasise the importance of internet information to analyse the level of corporate social responsibility (CSR) and the usefulness and accuracy of this type of information for corporation's internal and external audiences. Their study focuses at binding two streams of research together by using CSR disclosures on corporate websites as a proxy for corporate social performance (CSP) to investigate its cross-sectional relationship to corporate financial performance (CFP). The investigation includes Turkey's largest publicly held industrial enterprises. Results of regression analyses indicate that the level of CSP is not associated with the level of CFP, and vice versa. This study provides support for the view that CSP-CFP relationship might be weak for firms operating in developing economies.

In the 8th chapter, Sadullah Çelik and Aslı Yüksel Mermod propose a new strand of research for corporate social responsibility by considering the power and effects of voluntary data dissemination by corporations. The Economic and Policy Research Foundation of Turkey (TEPAV) collects information from producers in several different sectors of the Turkish economy through a survey that includes several questions and announces an index value titled as the Retail Sector Confidence Index (TEPE) for public use. The study uses

advanced econometric methodology to test the relationship between RSCI and other official and private leading indicators. They find that the RSCI of TEPAV is at least as good as any other indicator like the consumer confidence index and economic confidence index.

In the 9th chapter, Ayşe Demirhan, Serdar Bozkurt, Burcu Yiğit and Mehmet Çağlar review the general effects of Human Resources Practices on Sustainable Performance by applying their research based on their Survey on Technopark Companies. The authors' main point is to investigate the impact of human resources practices on organizational and market performance. As a result of this study, positive and high relationships between human resources practices and perceived organizational performance and market performance were determined. Moreover, it's found that human resources practices have an explanatory power of approximately 50% on perceived organizational performance and an explanatory power of 34% on market performance.

In the 10th chapter, Solomon Chukwuemeka Ugbaja and Refika Bakoğlu, inquire the integration of sustainability practices in Turkish universities through the research question 'How are Universities integrating sustainability practice in sustainability focused universities in Turkey as far as CORE system (Curriculum, Operations, Research, and Engagement) is considered?'. The research methodology relies on content analysis of the UI GreenMetric and universities' websites of selected universities from the UI Green Metric Sustainable University assessment and ranking index to observe Turkish universities' integration of sustainability practices. The sample of the study is selected from four hundred and seven (407) top sustainable universities ranked by UI GreenMetric. The study shows that universities that implement sustainability as part of their goals and have plans, policies, strategies and have gone ahead to integrate some of their sustainability goals.

In the 11th chapter written by Neşe Soysal and Ahmet Ok; the purpose of the study is to analyze prospective classroom teachers' attitudes toward sustainability and their perceived competencies on Sustainable Education. The results of their analysis reveal that prospective classroom teachers had positive attitudes towards environmental, economic and cultural aspects of sustainable development. However, their attitudes towards economic aspects of sustainable development were less positive than the environmental and cultural aspects. The main reason is probably related to their understanding of sustainable development and also the university they attended affected their attitudes towards Sustainable Development and their competencies of knowledge and systems thinking on Sustainable Education. Moreover, their fathers' education levels also affected prospective classroom teachers' competency of values on Sustainable Education.

In the 12th chapter, Merve Er Kara, Özlem Yurtsever, Seniye Ümit and Oktay Fırat focus on sustainable supplier evaluation and selection criteria. Companies started to focus on greening and sustainability issues in supplier evaluation and selection. There are several factors that increase the sustainability awareness of companies in their supply chain operations: changing customer demands, pressures from other stakeholders and complying with environmental legislations and regulations by related international organizations. This study aims to explore the sustainability issues in supplier evaluation and selection and present sustainable supplier selection criteria by reviewing the literature. One of the main results of this review is that;

environmental and social criteria are used less than the economic criteria in the supplier evaluation and selection literature.

In Chapter 13th Ayşe Ümit Gökdeniz argues the necessity of environmental accounting practices in terms of strategic implications of the information systems in companies. As environmental accounting information systems measure the environmental performance of corporate companies on the globe, there is an urgent need for an environmental accounting system to focus on controlling environmental costs. Also the author stresses on the need of new perspectives on knowledge-based environmental accounting applications. The author emphasizes on the vital role of information technology which is highly related to corporate social responsibility level of companies as management policy.

In the 14th chapter, Ayşe Uygur highlighted Turkey's importance as the third organic cotton grower in the world after India, China and criticized Turkey's unsatisfying position in organic cotton production in the world. Turkey is promising country for organic cotton production and is the third grower country in the world recently. Textile importation and textile exportation is important in Turkey and depend on the development in the World. The author underlines that collaborations among Farmers Associations, Agricultural Boards, Manufacturers, Governments, Trademarks, Non-Governmental Organisations, Consumers Associations and Fashion Designers must increase the amount of the transition to organic cotton from conventional cotton in the World as Organic cotton being a sign of sustainability.

In the 15th chapter, Recep Kurt explains a successful family business story from Uşak district, Turkey. The name of the entrepreneur is Hacı Ahmet Dede who gave his name to his products and continued his sustainable business which started in 1870 until now. The business concerns sesame paste and halvah production. The aim of the paper is to make an extensive research about the recent career plans of 4th,5th and 6th generations, the policies of human resources, the roles of women in this family business, the similarities and differences of the values of founder and family members, the level of the intergenerational conflict and differences such as cultural, business approach, opinion and management. Moreover, the financial problems and its solutions, the raising and education of children in family and all the impacts of these policies on their sustainable business are explored in multiple perspective way.

In the 16th chapter, written by Artür Yetvart Mumcu and Ozan Emre Ufacık; the purpose of the study is to observe the sustainability performance of enterprises in Borsa Istanbul (BIST) Sustainability Index. The main result of this research shows that for companies in BIST Sustainability Index, within the mission and vision expressions, social sustainability frequencies are more than economic sustainability frequencies. However, this study shows that economic Sustainability frequencies are more than social sustainability frequencies and also companies in BIST sustainability index have used social sustainability studies much more in their mission and vision statements. The unexpected output of their research has emerged in the analysis of the concept of Environmental Sustainability. It would have more frequency for a detailed examination of the topic.

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(Introduction: Social and Economic Perspectives on Sustainability)

18

1

Culture of Sustainability: How is the Concept of Sustainability Inspiring Innovation

Raya Tsvetkova
Savina Ezekieva

Abstract

In a world of endless diversity, there is something that connects many up-and-coming successful ventures with the resilient and highly successful market dominants, such as Sardex, Netfix and Google and that is their collection of values, attitudes and priorities – the culture of sustainability they have built and proliferated. Sustainability culture has a strong impact on all facets of life and business, and it is proving to be the way of the future. Most companies with any sort of strong product or service innovation culture exist also within a culture of organizational innovation and sustainable growth (OECD, 2015). This paper ventures to understand the nature of a culture of sustainability both within businesses and societies in several different aspects. What differentiates a sustainable culture? Is the culture of sustainability a fostering environment for social and commercial innovation? Furthermore, the paper explores the case studies of the companies mentioned above, and more, as well as supports these case-studies with personal research. As a summary and collection of all previously gathered data and cases, implications will be drawn for the introduction of policies, which can help sustainability culture exist and flourish.

Keywords: Sustainable development, organizational culture, innovation, case studies

Introduction

The 21st century society is living in one of the most complex, intricate and rapidly evolving environments that the human kind has ever witnessed. Numerous grave challenges lie in the path of mankind, including social inclusion, sustainable economic growth and environmental preservation. As a result of these urgent societal needs and issues, many modern businesses have placed their focus on deploying and incorporating the concept of sustainability on all organizational levels, embedding sustainable practices in both product development and process implementation (Leustean, 2016). However, what distinguishes genuinely responsible organizations that are valued and trusted by society is the existence of powerful sustainability culture.

In the contemporary business world, sustainability culture is perceived as the seamless web that interconnects all of the integral elements, processes and people within an organization. It creates the favourable internal environment which spurs creativity and innovation and is the building block of sustainable development. Sustainability cultures are those characterized by strong collective individuality which is capable of finding credible and responsible solutions, influencing the fundamental well-being of future generations. What is more, the indispensability of inclusive and accountable organizations characterized by strong cultures of sustainability are promulgated in the United Nations' Agenda 2030 (Bergman, 2015). As a result, organizations are increasingly relying on the effective development of an open and sustainable work culture which enables them to tap into the vast intellectual capacity and know-how of their employees, thus triggering the enormous potential for innovations:

Graph 1: Sources of Information used for Product and Process Innovation in the EU 2010-2012
(Source: Eurostat, 2015)
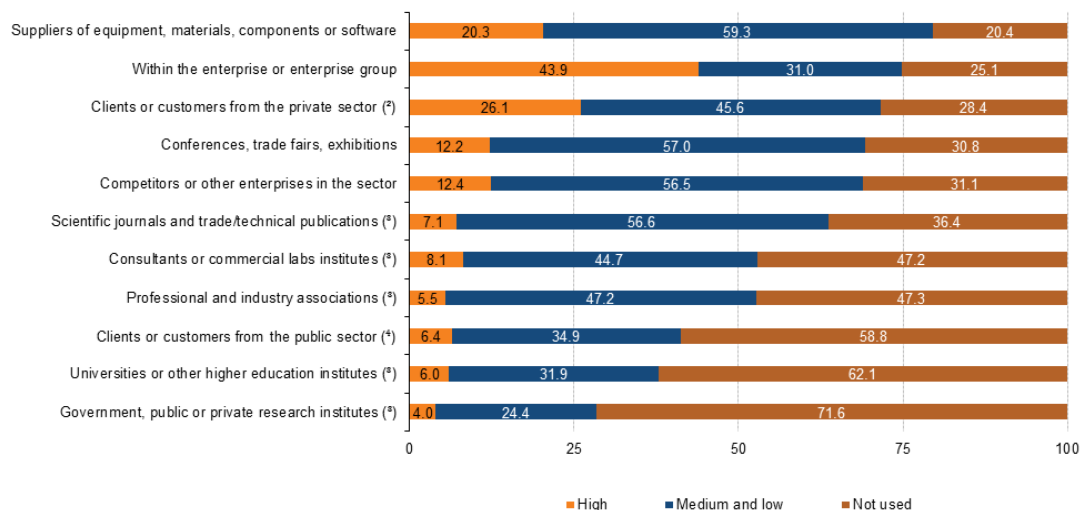
(¹) Excluding the Czech Republic, Denmark, Ireland, France, Latvia and the United Kingdom. The survey reference period covers the three years from 2010 to 2012.
(²) Excluding also Spain.
(³) Excluding also Sweden.
(⁴) Excluding also Spain and the Netherlands.
Source: Eurostat (online data code: inn_cis8_sou)

As it is evident from the graph above, 43.9% of companies in the European Union consider internal sources of information, including the contributions of employees, as essential to the success of innovation activities (Eurostat, 2015). This group also has the highest result in terms of importance to the development of effective innovation practices, a fact strongly in support of the interconnectedness of sustainability culture and innovation within the organization.

The objective of this paper is to analyse and evaluate the correlation between innovation practices and the existence of a sustainability culture by means of determining the relevant characteristics of the culture of sustainability and the major factors affecting innovation initiatives within companies. In addition, a combination of profound academic research and rigorous empirical analysis will be conducted in order to provide evidence in support or against the aforementioned statement.

The characteristics of a sustainability culture

Organizational culture, in its fundamental nature, consists of several crucial elements, namely the collection of values, practices, traditions and norms within a meaningful organizational context (Packalen, 2010). However, the creation and successful existence of sustainability cultures (or the s-cultures) demands paradigm-shifting efforts which go well beyond the ordinary expectations of society and hinge upon novel cultural characteristics.

Figure 1: The Elements of the Sustainability Culture (Source: Own conclusion)
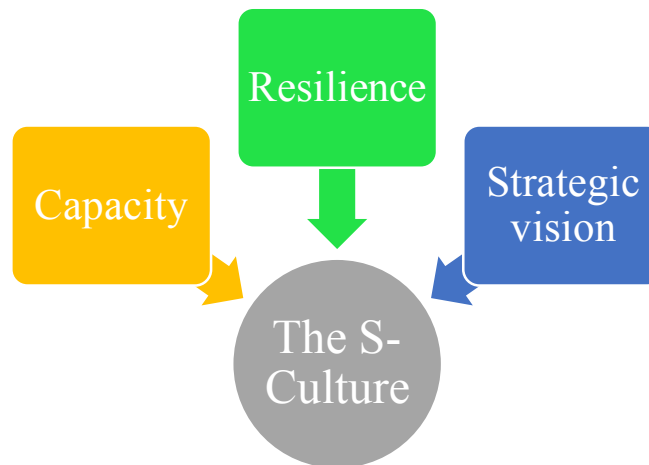
Sustainability cultures are those defined by the *superior capacity* of their employees to think, prioritize and act in manners accordant to the core principles and ideas of sustainable development. As the chairman of JetBlue Airways (one of the companies honored for their strong organizational culture) Joel Peterson said, cited by Spencer-Cooke *et al.* (2015):

"The actions of a business are its value statement… they swamp mission statements, speeches or memos, and they eclipse intentions."

This logic is rightfully adopted by organizations with strong sustainability cultures, which firmly believe that operating in a complex global domain whose environmental, social and economic challenges are deeply intertwined, requires the development of an open, proactive culture where employees have the capacity to anticipate and even trigger positive changes and act in ways that ameliorate their negative impact on the environment. With reference to that, the S-culture members place their efforts in integrating the four bottom-lines, being purpose, profit, people, and planet, with an aim of successfully transmitting responsible and transparent codes of conduct for both the contemporary and the future societies (Beck, 2014). In addition, organizational members participating in a culture defined by strong sustainability goals, are provided with the opportunity to freely experiment, take on new risks and collaborate actively in order to create synergies and disseminate self-reliance and responsibility on every level (Liebowitz, 2010).

The second pillar of the S-culture, the notion of *resilience* both in terms of organizational culture and societal progress, is closely related to the capability of individuals to respond efficiently and proactively to emerging issues and challenges in a broader context. As Mr. Imants Gross, the Director of the Nordic Council of Ministers' office in Latvia states before Finnsson (2016), recognizing the important role of businesses in solving the sustainability puzzle:

"Culture is not only about consumption, it's also about production. It's about creating better methods and producing better solutions."

According to a report by the USA's National Association for Environmental Management (2015), adopting a holistic approach towards environmental and economic risks is one of the distinguishing characteristics of successful organizations with strong S-cultures. What is more, careful and contingent planning combined with accurate assessment of social and environmental threats is what leads to effective mitigation strategies and drastically reduces hazards and vulnerabilities while paving the way for novel and often more efficient business solutions. All in all, there is a fine line between risk, failure and environmental disaster and it all boils down to the capacity of organizations to be resilient.

With respect to the third building block of the sustainability culture, namely the *strategic vision*, the main responsibility for the creation and proliferation of this vision is born by the company's leadership. An essential element of the S-culture is leadership by example and by a sense of transcendence, where the organization is proactively managed by publicly committing to ethicality, fairness and social responsibility through superior standards.

Furthermore, effective open communication and the establishment of a robust organizational infrastructure based on flexibility and empowerment, are the major attributes that attract competent, socially responsible and highly committed individuals to the organization (Jones *et al.*, 2013). The creation of a compelling vision

which outlines common goals for a sustainable future and postulates dedication, integrity and transparency in fulfilling the set objectives, is at the heart of the S-culture model.

Table 1: The Difference between the Mainstream and Sustainability Culture (Source: Own conclusion)

Mainstream Culture	The Sustainability Culture
• focus on quantity and authoritarian control • a reactive approach towards issues • rigidity and resistance to change • an organizational vision focused on profit maximization • development based on growth and acceleration	• emphasis on quality, empowerment, creativity and collaboration • proactive approach to challenges and risks • flexibility and autonomy in decision making • strategic vision propagating for a holistic approach towards the future • development based on balance and renewal

In summary, table 1 presents the vital differences between the traditional mono-dimensional cultures dominating today and the pioneering approach of the sustainability culture with its emphasis on systemic well-being.

Innovation and Sustainability Culture

It has been accepted in the academic and business fields that a culture that is not built to accommodate or is in conflict with the idea of creating innovation, will surely prevent its natural fostering (Szymańska, 2016). Moreover, the lack of flourishing innovation, be it in product or in any of the business processes in the organization, prevents the development of sustainable competitive advantage and market growth (Aniszewska, 2007).

However, with an increase of issues that concern the planet and all human societies, as well as our awareness of their existence as a species, many companies nowadays have created a different focus of culture. Cultures focused on sustainability, rather than innovation, exist in countries all over the world, manifesting in different ways and that brings its new specifics.

As discussed before, the three main elements of sustainability culture are capacity, resilience and strategic vision. Their existence in an organization's culture manifests as the product of determination and persistence, built into the way the organization functions and develops. And while there are many positive sides not only from an environmental, societal and a managerial perspective (in terms of aligned vision and coordinated, firm focus) there are also significant positive spillovers from the fostering of a sustainability culture. Evidence shows that one of those, in a way, externalities, is the nurturing and sparkling of innovation.

Later, when observing existing case studies of companies, which have adopted or developed a culture of sustainability, the exact terms of its existence and benefits will be discussed based on the study. However, the common traits and connections between sustainability culture and innovation can be most concisely summarized as:

- A 2014 study shows that corporate or organizational environmental sustainability leads to an increase of sustainability-related innovations (Lampikoski *et al.*, 2014);

- Awareness of sustainability issues brings more opportunities for innovation and new business opportunities, including reduction of costs and increases in efficiency of operations, which are created with the aim of using up less resources from the environment or using them in a more environmentally-friendly way. Further, sustainability-driven innovation leads to penetration of new markets with new customer groups, which will include more sustainability-conscious consumers – which is dually very unlikely to cause loss of customers, as it is a prestigious and favorable PR move. The creation and development of new products, services and business models, which aim to help and accommodate the needs of the contemporary society, will moreover, be a competitive advantage when those needs become prevalent. (Hansen *et al.*, 2009);

- Empirical evidence shows that innovation, which stems from integrated sustainability practices in companies (*i.e.* a culture oriented towards sustainability) positively correlates with overall organizational performance, and improved both financial and non-financial indicators (Maletič *et al.*, 2016).

In summary, studies definitively show the positive correlation between the existence of S-cultures in organizations and a following creation of sustainable, stable and often successful practices of innovation both in products and services, and in processes and business models.

Impact of Sustainability Culture on Innovation – Case Studies

"Corporations, because they are the dominant institution on the planet, must squarely address the social and environmental problems that afflict humankind."

This quote from Paul Hawken's book "The Ecology of Commerce" (1993) inspired Ray Anderson to change the activities, mentality and fundamentally, the organizational culture of his company Interface Inc. One of the factors, which make the organization a model for sustainability is the fact that in its belief system it is incorporated that not only does the company have to be sustainable, but the whole supply chain related to producing and delivering products to customer must be too (Stubbs & Cocklin, 2008). Moreover, employees are encouraged through different incentives to embrace and complement, as well as enrich this S-culture (Dubose, 2000) – a factor, which greatly helped build up and sustain this culture. The base on which the culture of sustainability exists in the organization are in those 7 pillars or fronts, as seen in the following excerpt from the company's site:

Figure 2: Seven Fronts of Sustainability in Interface Inc. (Source: Dubose, 2000)

Seven Fronts of Sustainability

To our founder and Chairman Ray Anderson, the journey to a fully sustainable Interface would be like summiting "a mountain higher than Everest" – difficult, yes, but with a careful and attentive plan, not impossible. As we created a framework for our climb, we identified Seven Fronts on Mount Sustainability through which we'd ascend:

Front #1 – Eliminate Waste: Eliminate all forms of waste in every area of the business

Front #2 – Benign Emissions: Eliminate toxic substances from products, vehicles and facilities

Front #3 – Renewable Energy: Operate facilities with 100% renewable energy

Front #4 – Closing the Loop: Redesign processes and products to close the technical loop using recycled and biobased materials

Front #5 – Efficient Transportation: Transport people and products efficiently to eliminate waste and emissions

Front #6 – Sensitizing Stakeholders: Create a culture that uses sustainability principles to improve the lives and livelihoods of all of our stakeholders

Front #7 – Redesign Commerce: Create a new business model that demonstrates and supports the value of sustainability-based commerce

As a result, Interface Inc. is an example of sustainability progress, and is known as a leading innovator in processes and production. They have achieved this in order to fulfill the ambitious seven pillars, which Ray Anderson puts in place in the beginning of this endeavor for sustainability. Not to ignore are also the brilliant end results of the efforts of the company both in terms of decrease of environmental impact and increase in financial gain (Nelson, 2009).

A different successful business model, which has leaned heavily or many would argue – solely succeeded, because of its sustainability nature, is the one of Sardex. Sardex is usually an unlikely case study for the topic of sustainability, as the company has not made any great efforts or developments in solving environmental or social issues. However, the success of the company has been largely attributed to the fact that it was founded and has grown with a strong and pervasive culture of inclusion and societal awareness. The company's unique interaction with their surrounding community is what has ensured their success, or as one of the owners says (Posnett, 2015):

"From the moment that I take from a community — as is the case in Sardex — I am in debt towards that community; when I settle that debt with the community, I have given what I have received."

On the other hand, Netflix is a company which has established itself as a modern enterprise with an enviable culture for its employees because of its pioneering HR ideas. A "culture of excellence" as they call it (McCord, 2014) is what has created an environment of happy employees, which perform only held to the highest of standards, while also receiving the treating that only executives could in other companies. This culture has been a source and driver of many of the most profitable ideas and projects in Netflix, as the founder and CEO of Netflix has claimed (McCord, 2014):

"Industrial firms thrive on reducing variation (manufacturing errors); creative firms thrive on increasing variation (innovation)."

Netflix has also often found itself in lists with most innovative companies in the world (Pomerantz, 2014) and as it is growing and expanding in new and innovative ways, the company is reaping many new successes (Stanley, 2014). Finally, it is worth discussing the case of Google (or Alphabet as a whole, further) and the culture it has harnessed and that has received widespread and honest praise and has been a huge driver that has positioned Google as a world's leading innovator (Vella, 2015). For its success, Google relies on a culture that values individuality and constantly evolves to accommodate the needs of employees and customers alike. According to Satell (2014), the culture of Google, which gives freedom and trust to its employees, as well as enough time and resources to handle problems they enjoy and that they are passionate about, allows for quick recognition and fixing of problems, as well as for continuous innovation. Moreover, because of ambitious goals related to sustainable development in terms of environmental care, Google has invested hundreds of millions of dollars in green energy for its data centres (Khoo, 2011) and even further – in recent years, it has spent more than a billion dollars in direct investments for energy efficiency and green energy for their operations and their employees; the company supports electric cars with enough parking spots that are also charging stations, and shuttles to drive employees, which save carbon emissions (Carus, 2013). Google's ongoing awareness and effort to protect the environment and develop the talent of its employees has in turn inspired them to focus on innovation – many of the creations, which can be considered a product of the culture, can also be seen as problem-solving for a large-scale economic, social or environmental problem, making the culture truly a sustainability one.

Methodology and Research Design

The empirical evidence gathered by our primary research for the purpose of analysing the link between culture and sustainability was based on the qualitative data approach, as the topic and its specificities are rather complex and ambiguous for quantitative representation. Through the utilization of various tools for quantitative research, with a major focus on small scale in-depth interviewing and distribution of relevant questionnaires to managers of multinational and local organizations, the results have indisputably proven that regardless of the industry and the nature of the organizational work, innovation thrives within open cultures defined by high levels of autonomy, creativity and empowerment. In addition, the majority of multinational and local companies interviewed agree upon the importance of fostering innovation in terms of organizational processes and activities. The major focus there is on creating transparent, reliable and socially responsible procedures that support long-term economic growth and prosperity.

For the purpose of this research, multinational companies, as well as start-ups operating in Bulgaria and Kosovo were analysed, providing evidence for the pivotal role of employees with respect to both incremental and radical innovation. What is more, one of the managers in a renowned digital payment services company, acknowledges and emphasizes on the contributions of individual organizational members and the value of employee diversity towards the creation of innovative services and processes in the firm. In addition to this

case, another successful local company operating in the leisure and tourism sector, states the importance of motivated and empowered employees as part of the sustainability culture, who bring added value and spur product and service-related innovations (innovative entertainment activities and new water attractions in the particular case). What unifies the aforementioned examples of sustainability-driven cultures is the superior employee capacity combined with a strategic vision towards a more resilient future growth, namely all those key characteristics previously presented as the core of the S-culture.

What the discussed case studies and our conducted research clearly show is that the drive towards sustainability and the appeal of sustainable development both for the entrepreneurs and managers, and for the customers they are targeting, is a key driver of innovation in companies, which operate in a culture of sustainability. The culture of sustainability manifests itself in different dimensions and drives innovation in varying ways; however, the correlation exists on a case-by-case analysis, as well as in a more universal rule.

Future Developments and Recommendations

Figure 3: Assessment tool for embedding sustainability (Source: Bertels et al.,2010)
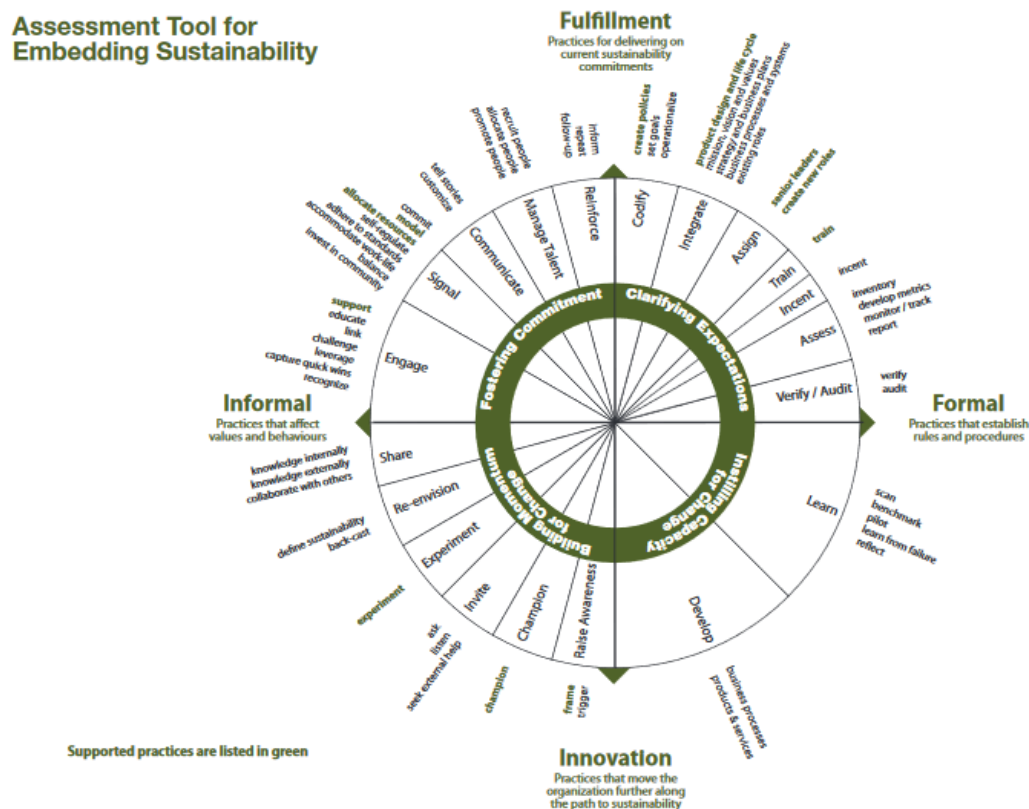
One of the crucial aspects to be considered by organizations is to facilitate internal knowledge sharing by carefully designing communities of practice and knowledge networks where employees can effectively share and collaborate on sustainability ideas and solutions. Moreover, systemic thinking is essential in order to prudently consider the entire lifecycle impact of business offerings and to subsequently minimize their harmful effects. A stronger comprehension of the aforementioned factors and embedding them into the S-culture would lead to enhanced understanding of the environmental complexity and would trigger the efforts towards innovation in every step of the value chain.

Another relevant and practical solution to the dissemination of sustainability knowledge and practices, is the incorporation of mentoring groups and networks. What is more, certain companies opt for the creation of reverse mentoring relationships, as these organizations believe that young individuals are more progressive, creative and environmentally-conscious and literate, and are able to bridge the environmental knowledge gap and transfer their know-how and ideas to senior colleagues and management (Fischhoff, 2014).

Additionally, blending the sustainability efforts at work with the personal initiatives of employees is an effective way to proliferate sustainability practices within the broader community and reinforce the values both in the internal organizational culture and the external environment. Many managers believe that this is the right path to disseminating the culture of sustainability on a broader scale and encouraging sustainable actions and behaviours, regardless of their scale (it can either be a "quick win" for sustainability solutions or a breakthrough innovation in the company).

Finally, the existence of a plethora of sustainability activities within the organizational community, including formal practices which establish procedures and guidelines and informal actions that influence the consolidation of values and norms, is of vital importance to the creation of strong sustainability culture which triggers innovative practices along the path to sustainability (Bertels *et al.*, 2010).

Conclusion

Cultures of sustainability are a new dimention of development in organizational culture. In a way, they can be seen as the culture of the future: aware of the societal problems and willing to work on fixing them through different means, in tight collaboration with employees, which are happy and motivated to do the work they do.

On a global scale, as UNESCO (2012) shows, S-culture is influencing the way the world is developing in terms of common goals and aims at improving quality of life all over the world through the promotion of sustainable development, equality and diversity.

As this paper showed, sustainability cultures add to innovation in companies for products, services, processes and attitudes towards labour and future developments. Case studies and empiric studies show the real benefits and true results of working in a sustainability-driven culture, including a better perception from customers and employees, higher level of motivation, increased innovation and productivity, and increased efficiency,

effectiveness and financial gain. What UNESCO discusses is that on an even wider scope, sustainability cultures may be at least partly the answer to many of the problems mankind faces today.
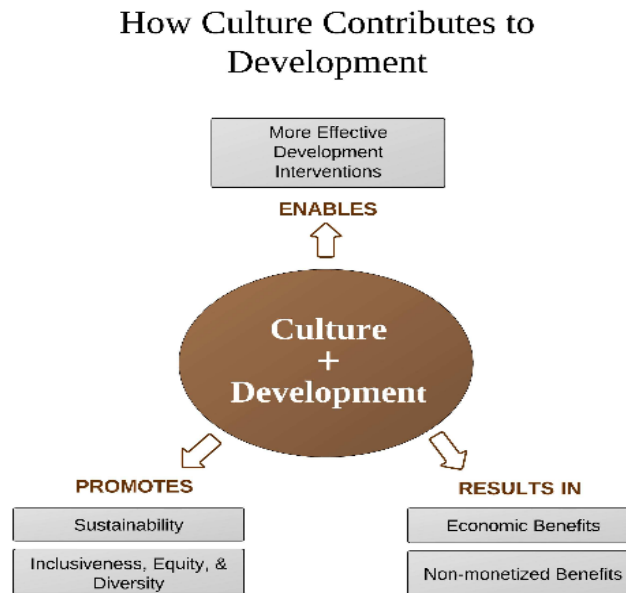
Figure 4: How culture contributes to development (Source: UNESCO, 2012)

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2

Asset Data in Social Housing – Culture and Data Quality

Caroline Duvier
Crina Oltean-Dumbrava

Abstract

Measuring the impact of building materials on the environment, but also their sustainability in terms of life cycle performance and cost, largely depends on how well data is recorded for these materials. Interestingly, how well data is collected and stored depends largely on the company culture. Since it is vital to have good data to assess the sustainability and environmental impact of asset data, implementing a data governance framework, where collection, storage, and analysis of data are closely monitored in terms of quality is recommended. Added to this, a change in company culture is necessary, through training and information dissemination targeted at highlighting the positive impact of good data collection and storage.

Keywords: Data quality, asset data management, social housing, cultural change

Introduction

The social housing sector in the UK is undergoing many changes recently due to governmental cuts and obligations to reduce greenhouse gas emissions on a national level. It has never been more important to make predictions on the future of the market and its assets. However, the social housing sector as a whole is experiencing difficulty in utilising its data. While data have been collected extensively over the years, they have not been used to make predictions or comparative analyses. This problem is widely recognised in the sector, with many housing providers moving towards better data collection and

data quality. This chapter focuses specifically on issues within asset data management, and offers practical solutions social housing providers can take to tackle data issues.

Background

The human impact on climate change has negative effects on our ecosystem, including ourselves, with anthropogenic greenhouse gas emissions being at their highest levels in reported history (IPCC, 2014). Mitigating efforts are underway, including government legislation such as the Climate Change Act in the UK (HMG, 2014), and responses by regulators to reduce greenhouse gas emissions in the building sector, both for existing and new builds (HMG 2010a, b, c, d). The social housing sector, representing around 17% of housing stock in 2015 (DCLG, 2016), also needs to follow regulations, such as the Code for Sustainable Homes, for building in more energy efficient and sustainable ways (ODPM, 2005). The goal of the UK government was to build only zero carbon buildings by 2016 (Pan & Garmston, 2012), and while this goal could not be met, there still exists an urgency to build in more sustainable ways. This sets the targets for new builds, but existing stock also needs to reduce its greenhouse gas emissions. In order to understand how much greenhouse gas a building is emitting and what improvements are needed, high quality data needs to be available. In social housing, this poses a major difficulty, as data collection and storage has not been considered a priority. Indeed, the sector as a whole faces large issues relating to data, their quality, and ability to analyse (Leach, 2016). The goal of this chapter is to highlight how data quality can be improved in the social housing sector.

Main Focus of the Chapter

Issues, Controversies, Problems

For any organization, data quality is one of the most important assets to have (Lee, Pipino, Fund & Wang, 2006; Sadiq & Berti-Équille, 2013). The social housing sector is slow to realize this, with data not being properly collected and maintained (Leach, 2016). Some of the main problems include the lack of understanding of the usefulness of data, lack of commitment by management to improve data quality, and costs related to improving data (Leach, 2016; Tee, Bowen, Doyle & Rohde, 2007). Poor data quality can lead to significant losses for an organization, including bankruptcy (Eckerson, 2002; Redman, 2013; Tee et al., 2007).

So far, one reported case exists of a successful case of data management in social housing. The Housing and Development Board (HDB) in Singapore is responsible for providing social housing, and moved, in a mammoth task, from 120 different databases to a single data warehouse that manages data successfully (Ang & Teo, 2000). Some social housing providers have taken steps towards better data quality by focusing on asset management strategies that aim to improve housing standards in the most efficient way (Gruis, Niboer & Thomas, 2004). While these strategies focus more on economical efficiency, asset data is also crucial in order to measure sustainable performance of a building, such as the measurements used to calculate Energy Performance Certificates (EPC) for buildings (Henderson & Hart, 2015), or modelling the sustainability of a

building (Oltean-Dumbrava, Watts & Miah, 2013), particularly social housing (Abuzeinab, Oltean-Dumbrava & Dickens, 2014).

Asset Data Case Study

Following the successful implementation of the data warehouse at the HDB in Singapore, a social housing provider in the UK decided to embark on a similar project. To start with, several variables related to the sustainability of the stock were chosen, and their data quality assessed. Table 1 outlines these variables. Variables were selected based on their influence on the environmental performance of social housing stock (CCC, 2008; DCLG, 2010; Maliene & Malys, 2009; Miller & Buys, 2013; Mulliner et al., 2013). According to the literature, the variables identified in Table 1 are most important in determining the environmental impact of a building, starting from insulation and heating systems, to window glazing and cold spots. All of the variables refer to assets, i.e. relating to stock rather than tenants. The Code for Sustainability (2008) specifies that social housing providers need to follow specific building requirements; therefore, knowledge of the current stock condition is necessary.

Table 1. Asset data together with detailed measures

Asset data	Detailed values needed for assessment
Condensation/damp/mould	Location, repair (yes/no), occurrence
Wall insulation	Type (cavity/solid wall), material, thickness, manufacturer, year of installation, thermal value
Roof insulation	Type (slanted/flat, etc.), material, thickness, manufacturer, year of installation, thermal value
Heating system and hot water heater	Type (gas, electric), manufacturer, model and make, year of installation, efficiency
Construction material	Type of material, manufacturer
Number of bedrooms	Count
Housing type	House, maisonette, flat, bungalow
Unit location	End/middle of terrace, ground/middle/upper floor level, storeys in dwelling and building
Windows and window frames	Glazing, year of installation, manufacturer, thermal value
Air ventilation system	Year of installation, manufacturer, make and model, location, air quality
Cold spots	Location, size, age
Sun exposure	Orientation, hours of sunlight per day
Door proofing	Material, manufacturer, heat loss

Researchers from the University of Bradford worked closely with the social housing provider and were based at their offices for the duration of the study. The team worked with all departments throughout the company to gather data for the variables in Table 1. Specific data holders were identified by conduction meetings and unstructured interviews with managers, directors, and team leaders. Following meetings and requests to gain access to data, the researchers were given data that existed in the company for this exercise, which is stored in various systems and spreadsheets. Next, the existing data was compared to a set of data criteria, selected

according to importance to the social housing provider, which was established through the values and mission of the social housing provider, and how well the criteria fitted with those.

Nine data quality criteria were used to assess the quality of asset data, taken from Wang and Strong (1996), Han and Kamber (2006), and Askham et al. (2013). These criteria were chosen due to their relevance to the organization's vision and mission. Table 2 gives an overview of the criteria, together with a description for each.

Table 2. Data quality criteria used in the assessment

Data quality criteria	Description
Accuracy	Values are free of errors
Accessibility	Values are accessible by those who need them
Completeness	There are no missing values
Consistency	Values are the same across different systems
Timeliness	Values are up to date
Believability	Values can be trusted by the user
Value added	Values benefit the organization
Interpretability	Values can be interpreted or displayed in a way that enables the user to extract information/knowledge
Validity	Values conform to syntax (format, type, range)

Data Quality Assessment Results

From the list of assets to be assessed, none of the efficiency values (thermal values, efficiencies for heating, etc.) were recorded by the organization, and these values could therefore not be assessed in this exercise. In total, 56% of all data was missing. The data quality criteria 'consistency' was impossible to assess due to the number of databases and spreadsheets used by the organization to hold data and difficulties for the researchers to access the databases. Seven databases are used to store the majority of information collected, and only one of them can be accessed by everyone in the company. The other databases have restrictions on who can access and manipulate data. Further, most databases are provided by outside organizations and not internally managed. Apart from databases, data is stored on spreadsheets in various departments across the organization and held by individuals, making sharing difficult.

Some of the biggest issues with the assessment were missing values with existing variables. Variables such as the glazing of windows, or wall insulation, were recorded for less than half of the properties. Other variables (in this case, heating system) were recorded more than once, making it impossible to assess which heating system was installed, and which one replaced, as year of installation is not recorded. However, this double recording did not occur in all databases, so other databases that also stored information on heating systems were either not updated, or stored the wrong heating system.

None of the variables fulfilled all data quality criteria satisfactorily. The best recorded variable was construction material, fulfilling five of the nine criteria (timeliness, believability, value added, interpretability,

and validity). All other variables received a maximum of three passed criteria, failing mostly on accuracy, completeness, consistency, timeliness, and believability.

Solutions and Recommendations

The assessment of data quality of asset data was significantly more complicated than initially assumed. Two main reasons for lack of data quality have been identified, namely the lack of a data governance framework, and a need to change the company culture to integrate data quality as a priority.

Policy Changes - Data governance framework

Data governance frameworks help in setting clear goals, roles, and responsibilities regarding data within a company (Sadiq & Berti-Équille, 2013, Thomas, 2006). The social housing provider in this case study has no such framework or similar structures in place, making it difficult to get people to take responsibility for data, or having a unified system that structures how, where, and what kinds of data should be stored. For example, repairs data is stored mainly as free text at first point of contact. The information is then transformed into a repairs category, again with free text from the person carrying out the repair. This way of recording data leads to loss of information, as the initial call from the customer was not taken up again in the notes by the repairs team, and free text makes data analysis very difficult. A data governance framework would also ensure that information necessary to make predictions about stock performance, such as energy efficiency values, is recorded. At present, the only variables relating to energy efficiency are those collected as part of an energy performance certificate (EPC), which is a governmental requirement when a property is re-let. However, EPCs generally do not record efficiency values such as u-values. Integrating all necessary variables in the data governance framework, including how and where they would be recorded, will give departments clear guidance.

One of the biggest advantages of having a data governance framework is the creation of responsibilities across the organization. A data governance framework is a policy, and without a policy in place, any attempt to create better data is likely to fail (Lee et al., 2006). Data needs to be governed by departments other than IT, as IT knows how to build the infrastructure, but specialized departments such as finance know what data are required and should therefore take responsibility for the data they need and use (Cheong & Chang, 2007; Wende, 2007). Having a framework in place allows for practices such as data champions ensuring high data quality throughout the organization (Tee et al., 2007), a very successful strategy for organizations.

Changes to Company Culture

While collecting data for the assessment, the researchers repeatedly experienced issues with accessing data, or the people responsible for the data. It was impossible to collect all the data necessary, even when approaching those who have unrestricted access to all databases. The reasons behind these difficulties can only be speculated at this point, but personal communication to higher management within the organization points towards two possible issues: fear of being made responsible for data that turns out to be of poor quality, and

lack of understanding of the importance of high data quality. Ang and Teo (2000) purport that individuals guard data they control, adding to the difficulty of gaining access to data.

Taking Ang and Teo's (2000) study on how the HDB in Singapore moved towards better data, their lessons can be adapted to the English social housing sector. They identified seven management issues that the organization had to deal with, all relating to changes within the company: (1) HDB almost went back to the drawing board by identifying business processes their data warehouse would support, and coming up with a detailed plan to achieve these processes. (2) Data is inherently complex, and high data quality means existing data needs to be cleaned, transformed, and standardized. HDB used an in-house approach so that they had full control over the data and develop a sense of ownership within the organization. (3) Rather than attempting a full-blown change, HDB opted for an incremental plan, meaning that small, highly focused tasks were preferred, together with the overarching architecture that was followed at every step. (4) User involvement was very important, as it deepens the user's understanding of the process, but also leads to greater satisfaction amongst staff in terms of team building and being perceived as a valuable member of the organization. However, data sharing was not welcomed by all, and dual ownership mechanisms were put in place to overcome resistance. (5) Getting the right people to lead each part of the project is crucial, in order to motivate the team and mediate disputes or disagreements. (6) Training in using data is a continuous effort and should be part of the long-term goals of any change towards better data within an organization. (7) Data maintenance is important, as the organization needs to stay flexible, and data changes over time. It also means that costs are reduced down the line, as continuous maintenance is cheaper than dealing with problems as they arise.

These seven points can be easily adapted to reflect the needs of other companies, such as the social housing provider in the UK. Indeed, an initial team has been identified through this project that will guide the shift towards better data governance. This team will focus on changing the culture of the company towards data, and will utilise the HDB case study as a guide.

Future Research Directions

This exercise concentrated on one set of variables, namely those important to the environmental performance of stock for the social housing provider. As a next step, researchers should conduct interviews or focus groups with members of the social housing provider to find out what data are most important for the provider in terms of conducting business. The exercise has shown that major issues exist in the collection and storage of environmental data – however, this data might not be of essential importance to the housing provider, considering the budgetary constrains in the current market situation. Through this exercise, the social housing provider realised the importance of data quality and cultural change, and is willing to implement a company-wide focus on better data governance.

Further, taking the approach of the HDB in Singapore, the data quality exercise should be extended to include incorporation of a cultural change and the implementation of clear rules and regulations regarding

data within the organisation, as outlined just above. The case study should therefore be extended from an exercise concentrated on data quality to an exercise incorporating all elements to do with changing the way data is collected and stored. This will allow researchers to investigate economic and social aspects of data governance, such as savings incurred, or changes in satisfaction by staff and customers alike.

Conclusion

The housing market is regulated by tight standards, but also has a moral obligation to provide good quality housing. Sustainability is a large part of this obligation, particularly for future generations. Data quality is invaluable for decision making in any organization, but particularly so for the social housing sector that relies on government funding and has a set budget. High data quality can ensure that decisions are made effectively and efficiently. The social housing market as a whole has a long way to go to achieving high data quality standards, as this case study on an asset data quality assessment highlights. However, by implementing a sound data management strategy such as establishing a data governance framework, together with commitment by management, high data quality is achievable. Social housing providers will be able to focus on providing sustainable, high quality housing, integrating innovation and creativity.

Acknowledgements

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3

The European Union
Renewable Energy Policy

Dilek Akbaş Akdoğan

Abstract

Energy remains in the center of the economic and social activities especially for industrialized countries and it is one of the major factors for the economic growth and sustainability. The development of a resilient Energy Union (EU) is one of the strategic objectives of the European Union. Ensuring stable, secure and sustainable energy supply at a reasonable price is the aim the Europe Union's energy policy and in this context renewable energy is a key driver of the energy policy. EU is following developments in renewable energy and building global leadership and shaping all over the world. This study firstly defines renewable sources and its status in EU and the reasons of deployment renewables are given. The objectives and the measures that the EU has set for member countries in the field of renewable energy are explained. Determinated targets in the field of renewables for 2020 and 2030 by the Directives of European Commission are discussed and the steps and the efforts taken in achieving the goals of 2020 and 2030 are evaluated. Support schemes for the development of renewable energy in EU are briefly explained. Legal Framework of EU renewable energy policy, applied policies, developments and problems encountered in this field are analyzed.

Keywords*: Renewable Energy, European Union, Energy Policy.*

1. Introduction

Fossil fuels were used commonly over the world by virtue of its cheapness and its existing developed production technologies until the oil crisis in 1970s. However, the energy crises of 1970s increased concerns about "energy security" across the world. Great numbers of countries understood how

energy and politics were intertwined. In those years the need and search for alternative energy resources have occupied the countries' agenda.

Renewable energy is defined as energy that comes from resources that are naturally replenished. The International Energy Agency (IEA) and clarifies hydropower, geothermal, bioenergy, solar photovoltaic, solar power, wind and marine (tide and wave) energy as renewable (IEA, 2016: 2). These energy sources are sustainable, clear and generally have negligible negative externalities. The use of renewable energy has many potential benefits. Renewable energy sources reduce greenhouse gas emissions and foreign energy dependency resulting also in the diversification of energy supplies. As is known renewable energy sources may bring economic benefits to many regional areas. Renewables may create new employment areas and they may also have the potential to stimulate employment in the EU, through the creation of jobs in new 'green' technologies (EUROSTAT, 2016).

Renewable energy is also finding a solution to the climate change that is one of the most important problems in our era. Climate change which is defined as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods" is an urgent issue in today's world (UNFCCC, 1992: 7). Renewable energy has already contributed to emissions reductions in the power sector.

By the Kyoto Protocol International Treaty that extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC) crucial international step has been taken. The Kyoto Protocol adopted in 1997 and put into force in 2005 has committed its Parties by setting internationally binding emission reduction targets and has determinated flexible mechanisms to reduce the overall costs of achieving its emissions targets. In this context, the concern for renewable energy has been increasing due to the environmental awareness and the economics issues in EU and across the globe. In 2005 European Union set up emission trading scheme (ETS) in response to Kyoto Protocol's targets. It is world's first and the biggest international emissions trading system (Mermod & Dombekci, 2011).

This study aims to examine the development of EU renewable energy policy. Legislative regulations and directives are evaluated and the policy instruments used are discussed in the field of renewable energy in the European Union. The study is completed with a conclusion and recommendations.

2. The European Union Policy on Renewable Energy

The energy crisis occurred in 1970's had negative effects on the European economies as well as other economies in the world. After that energy security has had a permanent place in the agenda of EU. In the 1990s, the EU has begun to set targets and policies for increasing share of renewable in energy market. In 1996, the European Commission prepared the Green Paper where the benefits of renewable energy on the EU's dependence, energy imports, regional development and employment issues was explained (EC, 1996). The European Commission prepared a new paper called White Paper in 1997. The White Paper has emphasized that renewable energy can play an important role in reducing CO2 emissions, in addition to

energy supply security (EC, 1997). Although EC has set targets in both Green Paper and White Paper for the share of renewable energy in total energy output (target in Green Paper is 12 % share, target in White Paper is 23.5 % share of total electricity production), neither of them has been achieved.

The Directive of the European Parliament and of the Council on the promotion of electricity produced from renewable energy sources in the internal electricity market has been published in 2001. The Directive has required Member States to specify targets for the purpose of increasing the use of renewable energy sources in electricity generation and to submit their instruments to achieve their targets (EC, 2001).

Another Directive of the European Parliament and of the Council on the promotion of the use of biofuels or other renewable fuels for transport has been published in 2003. The Directive has aimed at promoting the use of biofuels or other renewable fuels to replace diesel or petrol for transport purposes in each Member State. This directive has set a target of 2 % ratio for biofuels or other renewable fuels calculated on the basis of energy content, of all petrol and diesel for transport purposes placed on their markets by 2005 and % 5.75 ratio by 2010 (EC, 2003).

In 2007 European Commission published a document called "Renewable Energy Road Map" and this document designates the Commission's long term strategy for renewable energy in the European Union. Ensuring security of energy supply and reducing greenhouse gas emissions are the main objectives and in this context mandatory targets for 2020 are firstly proposed in Renewable Energy Road Map by Commission and at the 2007 spring, European Council, the EU political leaders endorsed the 2020 targets. Renewable Energy Road Map also proposes creation of a new legislative framework and in response to this the Renewable Energy Directive is published in 2009 and designates targets in the field of renewables for 2020 and creates a legal framework for 2020 targets.

The 2009 Directive 2009/28/EC is the most important basic of European Union renewable energy policy on the promotion of the use of energy from renewable sources. And it amends and subsequently repeals Directives 2001/77/EC and 2003/30/EC.

In 2011 European Commission prepared a document called "Energy Road Map 2050" and it determined the target of an 80-95% cut in greenhouse gases compared with 1990 levels. Energy Road Map 2050 states that special attention should be paid to the development of renewable energy. Decarbonisation of economy as one of the European Energy Union main dimensions inholds targets for renewables (EC, 2011).

The development of a resilient Energy Union is one of the strategic objectives of the European Union. In February 2015 the European Commission published a Strategy for a European Energy Union. The subjects that Energy Union concentrates on are energy security, completing the internal energy market, energy efficiency, decarbonisation and research, innovation and competitiveness. By this way the Energy Union has given a new impulse to the coordination and integration of energy policies in the EU (EPRS, 2015).

In the light of the strategy, it is stated that the European Union's energy policy is driven by three major targets. These are "competitiveness", "security of supply" and "sustainability". EU seeks to have a balance between these objectives while establishing energy policies (Republic of Turkey Ministry for EU Affairs, 2016). Renewable energy is a key factor of this general energy policy.

The primary production of renewable energy in 2014 was 196 million tons of oil equivalent (teo) and it is equal to 25.4 % share of total primary energy production for all sources in 2014. Table 1 shows the primary production of renewable energy in years 2004 and 2014. The amount of renewable energy produced in the EU-28 increased significantly by 73.1 % between 2004 and 2014 and that is equal to an average increase of 5.6 % per year (EUROSTAT, 2016).

Table 1: Primary Production of Renewable Energy, 2004 and 2014

	Primary production (thousand toe)		Share of total, 2014 (%)				
	2004	2014	Solar energy	Biomass & waste	Geothermal energy	Hydropower	Wind energy
EU-28	113.134	195.814	6,1	63,1	3,2	16,5	11,1
Belgium	760	2.857	9,4	75,8	0,1	0,8	13,9
Bulgaria	1.009	1.842	6,9	63,6	1,8	21,5	6,2
Czech Republic	1.875	3.656	5,4	89,0	0,0	4,5	1,1
Denmark	2.447	3.144	2,6	61,5	0,1	0,0	35,8
Germany	14.568	36.018	10,3	70,8	0,5	4,7	13,7
Estonia	681	1.186	0,0	95,4	0,0	0,2	4,4
Ireland	282	854	1,4	39,6	0,0	7,1	51,8
Greece	1.571	2.329	22,2	47,1	0,5	16,5	13,6
Spain	8.816	18.003	17,3	39,1	0,1	18,7	24,8
France	15.769	21.002	2,9	63,1	1,0	25,7	7,1
Croatia	1.847	2.292	0,5	62,5	0,5	33,8	2,7
Italy	12.193	23.644	8,9	42,2	22,1	21,3	5,5
Cyprus	48	111	66,7	17,8	1,4	0,0	14,1
Latvia	1.837	2.371	0,0	92,3	0,0	7,2	0,5
Lithuania	849	1.358	0,5	92,8	0,1	2,5	4,0
Luxembourg	51	120	9,3	77,2	0,0	7,7	5,7
Hungary	950	2.051	0,5	89,2	6,3	1,3	2,8
Malta	0	13	80,3	20,5	0,0	0,0	0,0
Netherlands	1.881	4.555	2,1	86,0	0,8	0,2	10,9
Austria	6.618	9.370	2,7	55,8	0,3	37,6	3,5
Poland	4.321	8.054	0,2	89,0	0,3	2,3	8,2
Portugal	3.800	5.848	2,2	53,8	3,2	22,9	17,8
Romania	4.594	6.090	2,3	61,9	0,5	26,6	8,8
Slovenia	822	1.180	2,8	50,1	2,7	44,4	0,0
Slovakia	745	1.441	4,0	70,4	0,5	25,1	0,0
Finland	8.728	10.068	0,0	87,6	0,0	11,4	0,9
Sweden	13.147	16.660	0,1	61,2	0,0	32,9	5,8
UK	2.929	9.696	4,1	62,3	0,0	5,2	28,4
Iceland	2.333	5.223	0,0	0,0	78,7	21,2	0,0
Norway	10.542	12.965	0,0	8,4	0,0	90,1	1,5
Montenegro	–	329	0,0	54,2	0,0	45,8	0,0
FYR of Macedonia	304	278	0,4	56,9	3,1	37,4	2,2
Albania	704	621	2,0	32,5	0,0	65,5	0,0
Serbia	1.859	2.068	0,0	54,0	0,3	45,7	0,0
Turkey	10.783	12.010	6,7	28,8	29,3	29,1	6,1
Bosnia and Herzegovina	696	2.278	0,0	77,6	0,0	22,4	0,0
Kosovo	176,3	263	0,1	94,9	0,0	5,0	0,0

Source: Eurostat (2016).

The figure below shows the final energy consumption in EU by sector with renewable share in 2014. Renewable share in the sector of heating and cooling is 46%, 30% in the sector of transports and 24% in the sector of electricity.

Figure 1: Final Energy Consumption in EU by Sector with Renewable share in 2014

heating and cooling 46%
transports* 30%
electricity 24%
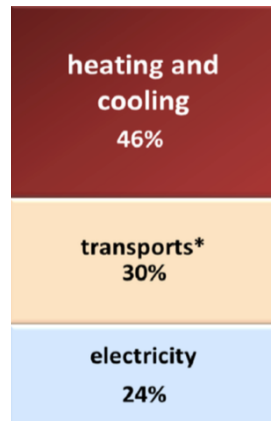
Source: European Commission (2016a).

EU aim is to make the European Union the number one in renewable energy. In EC 2015 publication EU is committed to become the world leader in renewables and center for developing the next generation of technically advanced and competitive renewable energies. The EU has also determined an EU target of at least 27% as the share of renewable energy consumed in the EU for 2030. The other dimension of European Energy Union is trinity called research, innovation and competitiveness. The EU must have a leading role in the next generation of renewable technologies (EC, 2015a: 15-16).

On 30 November 2016, the Commission published a proposal for a revised Renewable Energy Directive. Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (recast) aims to assure the target of final energy consumption for 2030. It is stated that this directive will enter into force on 1 January 2021 (EC, 2016b).

2.1. The European Union Renewable Energy Targets for 2020 and 2030

The Renewable Energy Directive 2009/28/EC adopted in 2009 determines a comprehensive policy for the production and promotion of renewables in the EU. The Directive requires the EU to achieve targets written below for 2020 (EC, 2009).

- *Increasing the share of renewable energy resources by 20% and increasing the use of biofuels in transport by at least 10%.*

- *Reducing greenhouse gases by at least 20% compared to 1990s levels*

- *Reducing energy consumption by 20%*

The Directive 2009/28/EC also requires regular reporting at national and community levels in terms of the development of renewable energy. Member countries have to develop and a national action plan every two years and they have to report on their progress (EC, 2009: 26).

As member states have different renewable energy potentials, technologies and gross domestic products, the Directive not only sets targets for the EU but also sets specific targets for each country. Besides member states have a degree of flexibility in choosing preferred approaches and areas of focus (Wyns *et al.*, 2014: 4-5).

EU has already determined the 2030 Energy Strategy. EU countries have agreed on a new 2030 Framework for climate and energy, including EU-wide targets and policy objectives for the period between 2020 and 2030. These targets aim to help the EU achieve a more competitive, secure and sustainable energy system and to meet its long-term greenhouse gas reductions target for 2050.

The European Union's targets for 2030 are;

- *40% share of reduction in greenhouse gas emissions*

- *At least 27% share of renewable energy consumption*

- *Increase energy efficiency by 27-30%*

- *15% share of electricity interconnection (EC, 2014).*

Every member state has selected its own way for achieving the target for renewable energy in their country. (Gaigalis *et al.*, 2014: 424). European Commission has merely proposed policies. *The policies that are set to achieve these targets are as follows:* -A reformed EU emissions trading scheme (ETS)- New indicators for the competitiveness and security of the energy system, such as price differences with major trading partners, diversification of supply, and interconnection capacity between EU countries- First ideas on a new governance system based on national plans for competitive, secure, and sustainable energy (EC, 2016c).

The Commission's Publication on electricity interconnections determines the target of having electricity interconnection links to other Member States of at least 10% of their own electricity production capacity by 2020. The publication explains how to achieve the 10% electricity interconnection target and it predicts 15% target by 2030 (EC, 2015b).

Investments in renewable energy should increase dramatically to reach the 2020 and 2030 targets. The Renewable Energy Directive 2009/28/EC requires a better use of structural funds and framework programmes and it is needed a better and increased use of funds from European Investment Bank and other public financier (Gaigalis *et al.*, 2014: 423).

Renewable energy currently ensure the needs of 78 million Europeans. The target of 20% final energy consumption from renewable sources by 2020 is not hard to make real (European Commission, 2015c: 2). When we look at the data of 2012, we can see that the European Union is about to achieve the 2020 targets. The greenhouse gases are reduced by 18% between 1990 and 2012. Renewables share reached 14.1% in 2012, up from 8.5% in 2005 and energy efficiency is expected to improve by 18-19% by 2020. Only targets of energy efficiency seem to be under the 20% target. But time will show (EC, 2016d).

2.2. Support Schemes for the Development of Renewable Energy in the European Union

Renewable energy sector is partly new than other energy sectors. Renewable energy technologies have an enormous potential but developing new renewable resources will require large initial investments to build infrastructure. Besides incentives for fossil fuels make renewable energy resources relatively costlier. In this context, government policy on renewable energy is vital. Renewable energy markets are not enough mature to be without government support. Support schemes for the development of renewable energy in the European Union is needed. Hence both the European Union members and governments encourage renewable energy by the incentives programs. Public support for renewable energy technologies ensures EU member states to reach the goals.

These support mechanisms are price based market instruments [feed-in tariffs (FIT) or feed-in premium (FIP)], obligations [tradable green certificates (TGCs) or renewable energy certificates (RECs)] fiscal incentives, tenders, tax incentives or credits, direct cash grants/rebates (OECD, 2012: 38-39). Feed-in tariffs are a fixed guaranteed price at which renewable power can be sold into electricity market. This incentive usually covers a certain period of time, such as the first 10–20 years. Feed-in tariffs and premium feed-in tariff can also implemented together with feed-in premium. Feed-in premium (premium feed-in tariffs) are similar to feed-in tariff, it is an improved version of FIT. A premium price feed in tariff (premium feed-in tariffs) also provides a guarantee of the purchase of the output of the renewable generator. But, the payment to the generator is made with the addition of a premium amount on top of the market price (Şimşek & Şimşek, 2013: 523).

Tradable green certificates (TGCs) or renewable energy certificates (RECs) are based on the idea of separating the actual power from its "greenness". In this mechanism renewable energy power is sold on the normal market and the generators can also sell a certificate that represents specific amount of renewable electricity on a different market established just for these certificates. The certificates are sold to large consumers or retailers of electricity that that have the mandatory to buy a certain number of these certificates (OECD, 2012: 39)

Financial incentives are significant for overcoming specific market barriers (Gaigalis *et al.*, 2014: 423). Lots of policies are designed to provide incentives for voluntary investments in renewable energy by reducing the costs of such investment. These finansal incentives are subsidies and rebates, tax incentives, grants loans. The most common fiscal instruments used by countries are tax measures. (Beck & Martinot, 2004)

The incentives mechanisms applied in EU member states are not identically same, the incentives mechanisms differ by the technology and countries types. A number of features can be listed for a successful incentive mechanism. These are; reduction of management costs, varying incentive mechanisms, reducing consumer prices, building investor trust, developing market, being compatible with general market structure and with other regulatory mechanisms, raising public awareness about renewables, eliminating of external factors (Deloittle, 2011: 2).

Member states may have joint support schemes, they can coordinate their national support schemes for renewable energy generation. When two or more member states coordinate, it can facilitate achieving the renewable energy targets in a cost-effective manner and it can make contribution to completing the internal energy market (Wyns *et al.*, 2014: 4-5).

Some countries in EU uses merely one instrument or mechanism for supporting generation of electricity from renewable sources. Feed-in tariffs and feed-in premiums are applied as the basic instrument in 20 member states. There is a tendency to choose feed-in premiums system. Germany, France, Austria, Ireland, Bulgaria, Greece, Latvia, Portugal, Luxembourg, Slovakia, Lithuania and Hungary use feed-in tariff as the only instrument. Poland, Romania and Sweden use quota obligation to support electricity from renewable sources. Italy, Denmark, Finland, Spain, Finland, Czech Republic, Estonia and Netherlands use feed-in premiums as the main support instrument or as part of the instruments mix (Zamfir *et al.* 2016: 90).

As of the end of 2015, fixed price policies are being implemented at national or regional / provincial level in 110 jurisdictions at the national or state/provincial level. In this case, feed-in tariffs is the most widely used and adopted instrument as support mechanism for electricity generation from renewable sources. Besides, tendering has gained gain speed in recent years. The demand of tendering instrument is increasing. Many countries that are both EU members and non-EU members are preferred tendering to feed-in policies. Many countries still use a combination of these policies to progress renewable energy sector (Akbaş Akdoğan, 2016: 155).

The European Union has been leading in funding the development of renewable energy sources since 2005. Between 2005 and 2012, Europe had the highest share in total new global investments in renewable energy sources. Only China has surpassed EU since 2013. The European Union also constitutes an admirable achievement for creating employment. It had the second highest per-capita employment in the area of renewable energy behind Brazil in 2014 (EEA, 2016: 11). Europe's renewable energy and technology firms employed about 1.2 million people in 2012 and also these firms have created stable jobs on regional and local basis thus sustainable growth (EC, 2015b: 4).

3. Conclusion

Renewable energy sources are sustainable, constantly renew themselves so will never run out. They increase security in the energy supply and diversity of energy power. Moreover, renewables meet targets for reducing

carbon emissions and ensure protection of the environment. Costs for renewable energy technologies have fallen dramatically in recent years. The government policies have a major influence on it.

To build a successful policymaking for renewables, establishing policy goals is needed. The European Union has clear and visible goals that they announced. EU has adopted lots of Directives and Papers for this purpose. Directive 2009/28/EC has big influence on EU renewable energy policy. It contains increasing share of renewable energy sources, additionally binding National Renewable Energy Action Plans and reduction rates for greenhouse gas emissions. The European Union 2020 has been an effective driving force for renewables. But it is certain that for more sustainable and secure energy system, higher share of renewable energy beyond 2020 is needed. The European Union targets for 2030 and 2050 (Road Map) are the important steps in this field. 2030 Energy Strategy has already been determined. EU has been taking firm steps forward in the field of renewable energy. The European Union is the key implementer of successful policymaking. Although EU has almost attained success for 2020 targets, the initial the costs of renewable energy investments are very high in both EU and other countries. Renewables still have disadvantages over against the traditional fuel based investments in terms of cost. This is the biggest barrier for all countries. It seems that renewables will be able to compete with fossil fuels in near future.

The European is the most widespread producer and user of renewable energy source. The European Union not only has a leading role including targets and incentives of renewable energy sources, but also it presents reliable sources of data by keeping statistics properly. Owing to the fact that the European region is not very lucky in terms of having the sources of oil and natural gas and the European Union has substantial environmental consciousness and awareness, the European Union also attach great importance to the renewable energy polices. In this case the European Union is following developments in renewable energy and building global leadership and shaping all over the world.

The process of liberalization in the field of energy of EU and the policies of EU towards creating a competitive energy market has been continuing. The transformation of the European energy system has become a mandatory rather than a necessity. Renewable energy is a key factor. Member states should make further effort to provide that renewable energy is better integrated into the market. Member States have more responsibilities in this field. The Legislative regulations are not sufficient in all member states. Necessary legal arrangements should be made and unnecessary bureaucratic barriers should be eliminated.

Cooperation and integration are important factors for the policy success. Europe needs to develop cooperation. Member states should be connected with each other in a renewable energy cooperation mechanism. EU's Energy Union Strategy is pertinent for Europe's future. Energy Union will ensure more cooperation and coordination within and between Member States and regions. But it will take a long time to form an Energy Union and the EU must continue to take steady and secured steps to ensure this.

Region selection for renewable energy production is also a very important issue. The types of renewables decided to produce should be suitable for the region and the governments support mechanisms should be correspond to the characteristics, nature of the region.

State intervention may be required in sectors that market failure exists. The sectors like energy and infrastructure generally needed to be supported by governments and state intervention may lead to efficiency or more productivity. Renewable energy sector is not mature and needs to be improved. Besides incentives for fossil fuels make renewable energy relatively costly. Through encouragement, renewable energy should compete with fossil fuels. In this context renewable energy in the European Union needed to be supported by the member states. But state interventions should be carefully designed. Every state intervention may not result in positive outcome.

As it is stated in the European Commission Paper (2015a) energy transition requires strategic planning. Within this scope long-term planning and concordantly long-term goals are required for achievement. All the members should have extensive long-term strategies.

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4

An Industrial Policy Recommendation for Raising Solar Energy Investments in Turkey and Its Possible Employment Effect

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Abstract

This paper aims to identify an industrial policy for Turkey to make use of its solar energy potential to raise national income and decrease unemployment. The paper is based on the premise that markets fail to provide required incentives for environmental sustainability. Therefore, governments must intervene and provide "policy rents" for investments in sustainability while withdrawing rents from polluting investments. The paper first reveals various opportunities that Turkey's solar energy potential may bring. Second, the accrual of the national income and employment which will be provided by solar energy investments is estimated through JEDI (Jobs and Economic Development Impact) method promoted by NREL (National Renewable Energy Laboratory) in the US to ensure realistic results from the analysis. However, because the model may not decide the magnitude of the solar energy installed power, the magnitude should be determined by the user. That is why 3,000 MW installed power put by the Ministry of Energy and Natural Resources for solar energy investments in "2012-2023 Energy Efficiency Strategy Document" has been taken into consideration. According to the results of the analysis, if Turkey actualizes its 2023 target for solar energy investment, the direct aditional employment amount might reach nearly 32,000 and worth of production increase might be 4,365 million $.

Keywords: Solar Energy, Industrial Policy, Employment, Sustainable Development, Turkey

1. Introduction

Sustainable development requires sustainable supply of clean and affordable renewable energies. Renewable energy resources like sunlight and wind never have any risk of depletion and every country has the potential to take advantage of these energy resources. Green growth policies that focus on renewable energy production resources prevent not only environmental degradation but may also stimulate economic growth and reduce unemployment.

Current energy markets are biased against renewable energies because of the "lock-in" effect of the established technologies (Mah & Hills, 2009).[1] As the conventional energy technologies are already mature and have achieved economies of scale, it is often difficult to achieve a short-term transition to renewable energy sources. The big challenge for the renewable energy industry has been to make the cost of clean energy competitive with heavily-subsidised conventional energy. Because of this, a strong push is necessary for renewable energy industries to emerge and prosper.

History shows that in all cases of successful catching up, the state has played a proactive role, be it in building markets, in nurturing enterprises, in encouraging technological upgrading, in supporting learning processes and the accumulation of capabilities, in removing infrastructural bottlenecks to growth (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014).

Turkey is an energy dependent country and the country's current energy mix is not suitable for sustainable development. Thus, Turkey today needs to transform its economy from being driven primarily by fossil fuel sources of energy to becoming an economy that can function effectively through renewable energy sources. Among the renewable energies, wind energy currently performs better. But, Pegels and Lütkenhorst (2014) inform us that while wind energy is already mature, learning curve of solar PV may still promise strong cost reductions.

Since 2008, the solar industry has grown rapidly as a source of energy and economic activity around the World. Combined with the sector's evolving cost competitiveness and continued technological improvements, it is clear that growth in solar will be supported well into the future (ITA, 2016: 17). Renewable generation costs continue to fall, particularly in solar photovoltaics. Falling prices in solar have helped bring it closer to grid parity compared to fossil fuels. Market expansion in most of the world is due largely to the increasing competitiveness of solar PV, as well as to new government programmes, rising demand for electricity and improving awareness of solar PV's potential as countries seek to alleviate pollution and CO_2 emissions (REN21, 2016: 60).

In the wake of the Paris climate agreement, China accounted for more than a quarter of global solar additions with a record 15.1 gigawatts of installations last year. China's total solar capacity was 43.2 gigawatts at the

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[1] Three major strands of lock-in effects are essential: Technology, market linkages and a combined organisational and individual experience pattern of managers. Each lock-in is an interdependent cause, effecting an organisational environment, which may result in fatal outcomes (Oestreicher, 2012).

end of 2015, surpassing Germany as the country with the most installed solar capacity (UNFCCC, 2016). Although the Turkish economy is not as competitive as the Chinese economy, it has an important potential to enable the development of the solar energy market. This is mainly because Turkey has reasonably well-educated and cheap workforce and this presents an important opportunity for Turkey to increase solar panel exports. However, for this to happen, there is a need for policies that will enable the development of the industry. Solar leasing, crowd sourcing, and the use of on-bill repayment, for example, should all improve the attractiveness of distributed PV for customers, with Turkey companies providing the knowhow and expertise to finance these projects around the world.

This paper aims to identify an industrial policy for Turkey to make use of its solar energy potential to raise national income and decrease unemployment. To ensure realistic results from the analysis in this study, the accrual of the national income and employment as a result of investments for the solar energy installed power has been estimated through JEDI (Jobs and Economic Development Impact) method promoted by NREL in the US. However, because the model may not decide the magnitude of the solar energy installed power, that magnitude should be determined by the user. That is why 300 MW installed power put by Ministry of Energy and Natural Resources for solar energy investments in "2012-2023 Energy Efficiency Strategy Document" has been taken into consideration.

The Next section looks at theorethical arguments for industrial policy. The following section investigates an industrial policy for inducement of solar energy investment in Turkey. The fourt section examins possible effects of solar energy investment drive in Turkey. The final section concludes.

2. Theorethical Arguments for Industrial Policy

The theoretical case for industrial policy is a strong one. The market failures which industrial policies target have long been at the core of what development economists study. The conventional case against industrial policy rests on practical difficulties with its implementation (Rodrik, 2008: 1).

Contrary to conventional wisdom, which often attributes the industrial successes of Western economies to laissez-faire and free market policies, the historical evidence shows that the use of industrial, trade, and technology policies was critical to their successful structural transformation (Lin & Treichel, 2014). The best economic performance was obtained by those countries that defied the conventional wisdom and put heterodox policy packages in place, while those that fully embraced the standard policy package experienced de-industrialization and macroeconomic volatility (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014: 11).

There is considerable historical evidence that today's most advanced economies have relied heavily on government intervention to ignite and facilitate their economic take-off, which allowed them to build strong industrial bases and sustain the momentum of growth over long periods (Lin & Treichel, 2014). There is little doubt that the period after the Second World War was a "golden age" of industrial policy, in large part because governments in developed countries were in broad agreement that balanced and coordinated expansion, increased provision of public goods and services, accelerated technological progress and

appropriately designed multilateral arrangements in trade and finance offered (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014).

There has been a renewed appreciation of the importance of industrial policy to achieving more economically sustainable and inclusive growth paths. The resurgence of interest in industrial policy was strongly inspired by the better understanding, based on overwhelming evidence and increasingly accepted by the mainstream economic profession, that the developmental states of East Asia had successfully used industrial policies to help them rapidly absorb know-how, technology and knowledge from the rest of the world, to assimilate them at a tremendous pace and to diversify into new and more sophisticated products (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). Japan in 1970's, South Korea and Taiwan in 1980's and 1990's, China in 2000's are the countries that applied selective industrial policy with the aim of obtaining a dynamic comparative advantage.[2]

2.1. Market Failures

Market mechanism is an effective tool, but there can be serious failures in the provision of correct signals from free markets. Market failure can be described as any situation where the individual incentives for rational behavior do not lead to rational outcomes for the society at large. When failure happens, less welfare is created than could be created given the available resources. There are six basic market failures. They are: 1) imperfect competition; 2) public goods; 3) externalities; 4) incomplete markets; 5) imperfect information; 6) unemployment and other macroeconomic disturbances (Stiglitz, 2000: 85). Markets fail when participants engage in fraudulent or anti-competitive behavior; they fail when transaction costs prevent the internalizing of technological and other non-pecuniary externalities; and they fail when incomplete information results in moral hazard and adverse selection.

In the early decades after the Second World War structuralism was in the ascendancy and emphasided that market failure as a pervasive feature of developing countries and stressed the role of active intervention. Later, neo-classical economists developed a contention that market failures are rare (Greenaway & Milner, 1993: 59). Even some economists – *i.e.* Austrian school economists – argued that market failure arguments are overblown, and indeed government failure is a bigger problem.

Probably the most important market failure is externalities. As Stewart and Gani (1991: 569) indicate, '[e]xternalities occur where market-priced transactions do not fully incorporate all the benefits and costs associated with transactions between economic agents.' Market can not take into account externalities, because it cannot put a price tag on them. If production decisions are left to the fortunes of the free market, investment in industries with high potential externalities may not be undertaken. The vast majority of investment will instead be directed towards projects that yield quick returns.

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[2] See Johnson (1982) for Japan, Amsden (1989) and Chang (1994) for South Korea, Wade (1990) for Taiwan, and Riskin (2007) for China.

Stiglitz (1989: 198) notes that among the "commodities" for which markets are most imperfect are those associated with knowledge and information. There are always unappropriated spillovers of knowledge. For instance, investment in knowledge suggests a natural externality. The creation of new knowledge by one firm is assumed to have a positive external effect on the production possibilities of other firms because, as Romer (1986: 1003) put it, 'knowledge cannot be perfectly patented or kept secret.'

According to Chang (2009: 489), there are positive roles that state intervention can play in promoting industrial upgrading, given important market failures that exist in the supply of new technological knowledge, such as the externalities generated by innovators experimenting with new things and the co-ordination failures across different input markets (for example, education, finance, legal institutions, and infrastructure).

Market failures are usually defined and understood in a static neo-classical sense, but the inability of markets to spontaneously bring about desirable structural transformations, *e.g.* in building dynamic comparative advantage, is ultimately the most important reason for industrial policy. While state intervention may not always be a superior solution to a market failure, a state failure may be better addressed by different government intervention rather than by relying on the market (Jomo & Togo, 2006: 15).

2.2. Systemic Failures

Justman and Teubal (1991: 1181) point out that 'over and above "simple" or orthodox market failure, the growth process encounters more fundamental failures associated with discrete strategic choices among alternative development paths or types of structural change ("strategic" failures). These involve not only market failures, but also the possible failure of public and private decision-making mechanisms and institutions to coordinate among the infrastructure elements for new industries, at the junctures of structural change: physical infrastructure; technological capabilities; marketing infrastructure; and financial institutions'. Justman and Teubal rightly suggest that there is no reason to believe either the unaided market or the pre-existing body of institutions will be able to tackle this challenge appropriately. Given the inherent uncertainty concerning future demand, firms are more likely to stick with the existing and familiar product lines rather than venturing into new products or industries. Hence, non-market forces or mechanisms are needed to stimulate such shifts, to lead economic agents from shorter to longer-term investment and marketing strategies, to channel projects from currently profitable activities into investment in those likely to become profitable over time.

The nature of the process of acquiring higher technological capabilities is such that a country trying to catch up with a more technologically advanced country needs to set up and protect industries in which it does not have comparative advantage (Chang, 2009: 490). A country will have a latent comparative advantage in an industry in which it would in principle be competitive based on the factor cost of production, but is currently not competitive due to transaction costs arising from lack of infrastructure and of a conducive business environment (Lin & Treichel, 2014).

3. Industrial Policy for Inducement of Solar Energy Investment

As Rodrik (2008: 5) rightly claims, 'development is fundamentally about structural change: it involves producing new goods with new technologies and transferring resources from traditional activities to these new ones.' Although being a late comer has its own disadvantages, it also has some advantages. It can learn from past experience, avoid some of the policy missteps of the past and has an opportunity to "leapfrog" directly to cleaner and more efficient technologies. For speeding up economic development and catching up frontiers, it is imperative to govern the market and create a virtuous cycle (Erdoğdu & Karaca, 2014: 77). The role of government is quite significant in terms of building generic capacity and capability through policy and institutional support measures. The government may provide incentives, direction and coordination.

The literature on development gives us good conceptual and empirical reasons to believe that market imperfections hinder the full private appropriability of social returns in growth-promoting investments, and this problem would remain even when institutions are decent (Rodrik, 2008: 5). Development requires intelligent industrial policy, organisation building, and efforts to accumulate technological capabilities through R&D, training and production experiences (Chang, 2009: 500-501). These advances offer developing countries many opportunities to catch up rapidly by learning to master technologies and products already available in more developed countries (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014).

Industrial upgrading is an innovation involving risks and externalities, whether in developed or developing countries, and thus requires the government to play a facilitating role. Governments in developing countries can play that role through the channels of information, co-ordination and compensation for externalities (Lin, 2009: 500). Learning builds up dynamic capabilities which are key drivers of catching up and economic development. These capabilities in turn shape patterns of productive transformation and job creation, as well as the speed and sustainability of the catching-up process (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014).

The specifics of industrial policy depend heavily on the circumstances and institutional capabilities of a country. Still, there are some general principles we can articulate about how institutions carrying out industrial policy should be designed. These principles follow from these considerations: (1) The requisite knowledge about the existence and location of the spillovers, market failures, and constraints that block structural change are diffused widely within society; (2) Businesses have strong incentives to "game" the government; (3) The intended beneficiary of industrial policy is neither bureaucrats nor business, but society at large. The first of these requires that industrial policy be "embedded" within society. The second calls for strong safeguards against bureaucratic capture and the third necessitates accountability (Rodrik, 2008: 18-19).

The big challenge for the renewable energy industry has been to make the cost of clean energy competitive with heavily-subsidised[3] conventional energy. Cost barriers range from the cost of technologies themselves,

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[3] Recent research from Bloomberg New Energy Finance reveals that governments are spending substantially more on subsidizing dirty forms of energy than on renewable energies. In fact, support for cleaner sources is dwarfed by the help the oil, coal, and other fossil fuel sectors receive. Government subsidies to renewable energy came to about $45 billion worldwide, compared to more than $550 billion spent to subsidize fossil fuels around the globe

the lack of access to affordable credit and the costs of connecting with the grid and transmission charges, which often penalize intermittent energy sources. Import duties on renewable technologies and components also act to make renewable energy costlier (Sawin, 2004: 1). For the most part, the barriers that exist in developing countries are similar to those in the industrial world. However, specific national characteristics, particularly within the developing world, can play an important role in determining barriers from one country to the next. Additional barriers in many developing countries include poor transport and communication infrastructure, lack of trained personnel, and low literacy rates. Moreover, the perceived risk of investing in renewable energy projects in developing countries is high, owing to uncertainties about political, regulatory, and market stability (Mendonça, 2007).

Policy measures to support an industry can be grouped into two categories: direct and indirect measures. Direct measures refer to policies that specifically target a local industry, while indirect measures are policies that indirectly create an environment suitable for a local industry to prospere (Lewis & Wiser, 2005). Next section will first look at direct measures.

3. 1. Some of Direct Policies for the Promotion of Solar Energy Investment

There are a variety of policy alternatives which could directly favour domestic production. They can be seen at Table 1.

Table 1: Some Direct Support Policies for Domestic Production

Direct Policy	Implementing Countries
Local Content Requirements	Spain, China, Brazil, Canadian States
Financial and Tax Incentives	Canada, Australia, China, American States, Spain, Germany, Denmark
Favorable Customs Duties	Denmark, Germany, Australia, India, China
Export Credit Assistance	Denmark, Germany
Quality Certification	Denmark, Germany, USA, Japan, India, China
R & D	in different ways, all countries - especially Denmark, Germany, USA and Netherlands

Source: EMSAD (2009).

Local Content Requirements, Preference or Incentives for Local Content

One direct way to promote an industry is to oblige the use of locally-manufactured technology and other inputs. A common form of this policy requires a certain percentage of *local content* installed in some, or all, projects.

Financial and Tax Incentives

Financial incentives come with stipulations, such as minimum investment amounts, qualifying system requirements and maximum limitations on the amount of the incentive. Tax incentives may take the form of

capital- or production-based income tax deductions or credits, accelerated depreciation, property tax incentives, sales or excise tax reductions and VAT reductions.

Favourable Customs Duties

Another way to create incentives for local manufacturing is through the manipulation of customs duties to favour the import of solar PV panel components over the import of entire solar PV panels. This creates a favourable market for firms trying to manufacture or assemble solar PV panels domestically by allowing them to pay a lower custom duty on imported components than companies that are importing full foreign-manufactured solar PV panels.

Investment and Energy Subsidies

Investment subsidy is a grant for the installation of capacity that reduces costs for consumers and producers. As Mizuno (2007: 349) points out, investment subsidies in its early years can be an effective means of kick-starting the market. Energy subsidies may be direct cash transfers to producers, consumers, or related bodies, as well as indirect support mechanisms, such as tax exemptions and rebates, price controls, trade restrictions, and limits on market access. They may also include energy conservation subsidies (Whitley, 2013).

R&D Support and Demonstration Programs

Many studies have shown that the sustained public support of research can be crucial to the success of a domestic industry (Lewis & Wiser, 2005). R&D is often most effective when there is some degree of coordination between private and public institutions, such as national laboratories and universities.

Many countries have applied aforementioned policies to promote solar energy investments and have achieved significant gains. In the United States, for example, the federal business energy investment tax credit is available for solar energy and fuel cells. For solar energy, the credit is equal to 30% of expenditures on equipment that uses solar energy to generate electricity, to heat or cool and on hybrid solar lighting systems. Besides the investment tax credits, the US Federal Government also provides an accelerated cost-recovery system through depreciation deductions: solar energy technologies are classified as five-year property. In addition, the federal Economic Stimulus Act of 2008, enacted in February 2008, and the American Recovery and Reinvestment Act of 2009, enacted in February 2009, provide a 50% bonus depreciation to solar energy technologies implemented between 2008 and September 2010 and 100% bonus depreciation to solar energy technologies placed in service after September 2010. In the case of residential tax payers (*i.e.*, non-business taxpayers), a taxpayer may claim a credit of 30% on qualified expenditures on solar energy equipments (*e.g.*, labor costs for onsite preparation, assembly or original system installation). If the federal tax credit exceeds tax liability, the excess amount may be carried forward to the succeeding taxable year until 2016 (Timilsina *et al.*, 2012: 458).

The 30% federal tax credits have provided significant leverage to solar energy development in the United Sates, where state governments have further supplemented federal tax incentives with their own programs. For example, the one megawatt CSP project (Sugarno project) installed by Arizona Public Service (APS) in 2006, and the 64 MW Nevada Solar One parabolic trough CSP installed in Boulder City, Nevada in 2007 have largely benefited from the federal tax credit scheme (Canada *et al.,* 2005). In Bangladesh, the primary driver of the PV market is microcredit finance that led to the substantial growth of privately owned Solar Home Systems (SHS) (IDCOL, 2008).

Another incentive mechanism that implement of each country or state to promote renewable energy investments is subsidies. The rebate program for solar PV in California under the California Solar Initiative (CSI) is a significant example of a subsidy scheme for solar energy. The goal of the $3.3 billion CSI program is to support the development of 3000 MW of PV in California by 2017 using rebates, also known as "Buy-Down" and performance-based incentives (PBI). For systems 50 kW and smaller, the buy-down level is calculated based on expected system performance, taking tilt, location and orientation into account; the subsidy is referred to as Expected Performance-Based Buy-Down (EPBB). The better the system is projected to perform, the higher the rebate it receives. Preliminary results indicate that the ambitious target set under the CSI can be reached (CPUC, 2011) with 506 MW already installed by April 2011 and another 403 MW pending. Progresses have been most impressive in the residential sector while progresses are slower for the non-residential sector (Timilsina *et al.*, 2012: 459).

The Czech government launched a new incentive scheme with the name National Energy Efficiency Action Plan on 2014 April for energy efficiency that will also support the installation of residential PV systems for self-consumption. The government will allocate a total of 27 billion CZK ($1.13 billion) for the program over the next 10 years, of which 520 million CZK ($21.8 million) in 2015 and 2.85 billion CZK in 2016. The Parliament has approved within the scope of this law that exempts rooftop PV projects up to 10 kW from requiring building approval. Thanks to law, the country installed 2 MW of solar PV alone in 2014 (Insider, 2015).

In addition to these incentives, some financial institutions provide conditional loans suitable for solar energy investments, thereby ensuring the spread of these investments. In India, the Shell Foundation worked with two leading banks Canara Bank and Syndicate Bank, to develop renewable energy financing portfolios. This project helped the banks put in place an interest rate subsidy, marketing support and vendor qualification process. Using the wide network of their branches, the interest subsidies were made available in over 2000 branch offices in the two states of Kerala and Karnataka. Within two and half years, the programs had financed nearly 16,000 solar home systems, and the subsidies were gradually being phased out. Whereas in 2003 all sales of PV home systems were on a cash and carry basis, by 2006, 50% of sales were financed (Usher & Touhami, 2006).

The rapid growth of the grid-connected PV and CSP market is largely attributed to a policy suite that guarantees attractive returns on investment along with the technical and regulatory requirements such as grid

connectivity and power purchase commitments required to incentivize investments. While FITs played an instrumental role in Germany and Italy, a mix of policy portfolios that includes federal tax credits, subsidies and rebates, RPS, net metering and renewable energy certificates (REC) facilitated solar energy market growth in the United States. Although some policy instruments have leading roles in promoting solar energy in some countries, a mix of policy instruments, instead of a single policy, would be more effective. For example, when the initial 354 MW of parabolic trough CSP was constructed in California, it benefited from the combination of federal tax credits, favorable utility power purchase agreements, and property tax exemptions from the State. Although property tax exemptions may not be a significant incentive for residential PV systems, property taxes can amount to millions of dollars for large-scale, ground-mounted solar thermal electric projects (Timilsina *et al.*, 2012: 460).

The capital subsidy was the predominant policy instrument early on in India, but a mix of policy instruments, such as, subsidies, fiscal incentives, preferential tariffs, market mechanisms and legislation, were encouraged later for the deployment of solar energy (MNRE, 2006). For instance, in 2004–05, the subsidy for the solar photovoltaic program varied between 50% and as high as 90% for the 'special category states and islands.' Similarly, the subsidy for solar photovoltaic water pumping was Rs. 100/Wp and as much as Rs. 135/Win the special category states (Banerjee, 2005). The growing role of private finance has reduced the role of fiscal policy drivers in the overall financing mix for solar power, and capital subsidies have been ratcheted down substantially, except in exceptional cases such as "remote villages and hamlets." India now relies on a mix of mechanisms including various tax and generation-based incentives, renewable purchase obligations, capital subsidies and accelerated depreciation. Yet, the accumulation of incentive programs and the failure to coordinate them is thought to hinder the development of renewable energy resources in India as it results in unnecessary delays and conflicts (ESMAP/WB, 2011). In the Philippines, the portfolio of policy instruments includes duty-free importation of equipment, tax credits on domestic capital equipment and services, special realty tax rates, income tax holidays, net operating loss carry-over, accelerated depreciation and exemption from the universal charge and wheeling charges (WWF, 2008; Timilsina *et al.*, 2012: 460).

3. 2. Some Indirect Policies for the Promotion of Solar Energy Investment

There are many indirect policies for the promotion of solar energy investment. Recent experience from around the world suggests that feed-in tariffs, or what are now called renewable tariffs, are the most effective and efficient support schemes for promoting renewable electricity (Lauber, 2005; Couture & Gagnon, 2010; Haas *et al.*, 2011; Pegels & Lütkenhorst, 2014).

Feed-in Tariffs

A feed-in tariff (FIT) is an energy-supply policy focused on supporting the development of new renewable power generation. Feed-in tariffs (feed-in laws) offer renewable energy developers a guaranteed power sales price, coupled with a purchase obligation by electric utilities. Standardized interconnection requirements for renewable generators are also a common and important component of feed-in tariffs (Wiser, 2002: 2). Feed-

in tariff systems are characterized by a specific price normally set for a period of several years, which must be paid by electricity companies, usually distributors, to domestic producers of green electricity. The additional costs of these schemes are paid by the suppliers of conventional energy forms, in proportion to their sales volume, and are passed through to the power consumers by a way of a premium on the kWh end-user price. The goal of feed-in tariffs is ultimately to offer cost-based compensation to renewable energy producers, providing the price certainty and long-term contracts that help finance renewable energy investments (Couture *et al.*, 2011: 71).

If the feed-in tariff is highly attractive when compared to renewable energy costs, substantial amounts of renewable energy might be developed. However, the level of the fixed price must be carefully set in order to ensure that the costs of the overall policy do not exceed the benefits. Conversely, If the feed-in tariff is not attractive little development might occur (Wiser, 2002: 9). Stepping FITs (*e.g.* by decreasing the FITs over time according to the expected learning curve and economies of scale and scope effects of both new renewable and conventional energy technologies, and/or the discriminating of the feed-in tariffs according to some technology performance indicators) can lead to comparable cost reductions with FITs[4] (Haas *et al.*, 2004: 838).

Mendonça and Jacobs (2009: 1) argue that FIT promotes the fastest expansion of renewable electric power at the lowest cost by spreading the costs among all electric utility customers. A study evaluating renewable energy policies in EU countries found that the FIT is the most effective policy instrument to promote solar, wind and biogas Technologies (CEC, 2008: 7). As of year-end 2015, 110 jurisdictions at the national or state/provincial level had enacted feed-in policies, making this the most widely adopted regulatory mechanism to promote renewable power (REN21, 2016: 20). FITs cover all types of solar energy technologies (*e.g.,* small residential rooftop PV to large scale CSP plants). The tariffs, however, differ across countries or geographical locations, type and size of technology (Timilsina *et al*., 2012: 458).

For example, German feed-in payments are technology-specific, such that each renewable energy technology type receives a payment based on its generation cost, plus a reasonable profit. The FIT is further subdivided by project size, with larger projects receiving a lower feed-in tariff rate in order to account for economies of scale, and by project type, with freestanding systems receiving a low FIT (BMU, 2007). Particularly in Germany, the Renewable Energy Sources Act (EEG) implemented has demonstrated the effectiveness of joint industrial and political commitment through its most dominant and effective instruments, the fixed FIT.

Utility Quota Obligation

Utility Quota Obligation generally called as renewables portfolio standard (RPS), renewables obligations or quota policies. A standard requiring that a minimum percentage of generation sold or capacity installed is provided by renewable energy. Obligated utilities are required to ensure that the target is met (REN21,

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[4] For comprehensive FIT policy design, implementation, and RPS policy interactions see Cory *et al.* (2009) and Pegels (2014)

2012). Under an RPS, a country or state requires all utilities or retail suppliers to purchase a certain amount of renewable energy. Many design variations of an RPS are possible and this policy may be used in conjunction with other policies, such as a tendering auction, or a public benefits fund. In its most common form, this policy requires that a fixed percentage of electricity in each retail suppliers' portfolio be generated by renewable resources, though clearly the actual policy design can be tailored to meet specific domestic markets (Lewis & Wiser, 2007: 1854).

RPS create a trading regime where utilities with no or low renewable electricity content in their overall supply portfolio buy from those with high renewable electricity content. In the United States, 31 out of 50 States have introduces RPS. The standards range from 10% to 40%. New Jersey became the first state to create an RPS with specified standards for solar energy. The New Jersey RPS required that 6.8% of the electricity sold in the state be renewable by 2008, of which 0.16% was to come from PV.

Both feed-in tariffs and RPS are government-mandated policies designed to create a market for renewable energy. However, unlike the feed-in tariff, the RPS is a quantity-based policy that establishes a target quantity of renewable energy to be included in the electricity mix by a specific date. An RPS also specifies who is responsible for obtaining that renewable energy and defines the penalties for non-compliance. A well-designed RPS can be extremely effective in bringing new renewables on-line, while a poorly designed RPS can have little or no effect on new renewable development (Wiser, 2002: 3).

4. Possible Effects of Solar Energy Investment Drive in Turkey

Supplying large part of energy demand with fossil fuels pose an obstacle for the sustainable development. This is mainly because consumption of fossil fuels cause negative externalities, such as damage on environment and health (Karaca, 2016: 246). Producing electricity from sun, on the other hand, would create significant positive effects, primarily on environmental quality, employment, the balance of payment deficit and the budget deficit.

4. 1. Development Effect of Solar Energy Investment (Induced Effect – Multiplier Effect)

Producing electricity from sun may provide huge benefits. In particular, by producing PV panels using domestic components and with lower wage rates would mean Turkey may gradually gain international competitiveness in the solar industry. Eventually, Turkey could earn important amount of foreign currency in this sector, which would help to decrease the current account deficit. Moreover, reduced production cost of electricity generated from solar energy would not only promote the wide-spread use of solar energy within Turkey, but also decrease energy dependency of Turkey (Erdoğdu, 2016).

It may be stated that multiplier effect may be higher in the countries such as Turkey in which energy import dependency rate is high and job creation level is not well enough. Solar energy investments may contribute particularly the development of economic activities in rural areas. The improvements in the technologies of these power plants contribute to local and national economy by providing the formation of new manufacture

and service sector within local, national and international levels. Based on the work of Perloff (1957) which demonstrated that growth rate of local industries develops much more than the national growth rate, it is possible to make these investments as the locomotives of national economy by achieving scale economy in solar energy technologies. In this respect, production costs decrease by benefiting from scale economies and external economy advantages occur in labour market after all the companies which provide the production with procurement concentrate on determined areas (Krugman, 1990: 4). It must not be forgotten that the technological developments together with the easier actualization of information exchange and productivity growth will bring international competitive power to such industries in this process.

4. 2. Employment Effect of Solar Energy Investment

Numerous works demonstrated that countries investing in renewable energy tends to reach respectable level of employment. Some of the countries using this opportunity can be seen on Table 2. By creating investments in renewable energies, a total of 8.1 million people could be employed all over the world in 2015. Solar energy creates the largest employment share with 46 per cent among all the renewable energies with a total of 3.7 million employed people.

As seen on Table 2, solar energy investments create the highest opportunity for employment among renewable energy sources. China, for instance, employs about 2,4 million people merely from solar energy production.

Table 2: Employment in the Renewable Energy Sector (year 2015, thousand)

	World	China	Brazil	USA	India	Japan	Bangladesh	European Union		
								Germany	France	Other EU Countries
Biomass	**822**	241	n.a.	152	58	n.a.	n.a.	49	48	214
Biofuel	**1,678**	71	821	277	35	3	n.a.	23	35	47
Biogas	**382**	209	n.a.		85	n.a.	9	48	4	14
Jeotermal	**160**	n.a.	n.a.	35	n.a.	2	n.a.	17	31	55
Hidro	**204**	100	12	8	12	n.a.	5	12	4	31
Solar (panel)	**2,772**	1,652	4	194	103	377	127	38	21	84
Solar (heating)	**939**	743	41	10	75	0.7	n.a.	10	6	19
Wind	**1,081**	507	41	88	48	5	0.1	149	20	162
Total	**8,079**	3,523	918	769	416	388	141	355	170	644

Source: IRENA (2016: 17).

Employment opportunities appear in the processes such as the installation of power plants, their operation and maintenance processes. Employment in these processes is divided into direct, indirect and induced

employment. Direct employment is composed of the workers who work in the production of the materials to be used in solar energy investments and of the core team who is assigned to design, installation, maintenance and repair. Because it is easy to determine the labourers in solar energy projects which are established and operated in different fields, it is much easier to determine full time workers than other employment types in terms of direct employment.

Indirect employment is composed of secondary sectors which are necessary for the installation and operation of solar energy investments and which supply input for primary sectors. The workers who extract and process the necessary raw material for solar energy investments and who work in consulting firm and research-development institutions shape this employment. Induced employment is a kind of employment which is induced through the inclusion of incomes gained by direct or indirect employment emerged as a result of solar energy investments. The employment which is gained for supplying the food and accommodation demands of workers in solar energy sector can be shown as an example. However, because it is difficult to determine the connection between direct-induced employment and renewable investments, most of the researches are overlooking such kind of employment or including these effects into analysis based on a rate.

Contrary to the last two phases, the contribution to the total employment is higher in the first two phases which have material production and the installation of power plant. Accordingly, 90 per cent of the total employment work in production and manufacturing and installation while 10 per cent work in management and maintenance and repair. Based on this data, it is rather important to ensure an increase in employment by using local resources for solar energy investments and the necessary production for these investments. In the case of ensuring used materials through importation and fulfillment of installation by a foreign firm, a small part of the total employment will stay in Turkey. If induced factors are to be increased in the economy, this matter has to be carefully taken into consideration by the policymakers.

4. 3. An Analysis of 2023 Target

According to *Energy Efficiency Strategy Paper 2012-2023*, Turkey has an electricity production target of 3,000 MW from solar energy by 2023. This section will estimate gross direct and indirect jobs, earnings, and economic output potentials of solar energy in Turkey. Calculations of these estimations will be done with the JEDI method developed by the NREL in the US.

JEDI model is a representation of national or regional economic accounting that records the way industries trade with each other and produce flows of products and services. The Jobs and Economic Development Impact models are user-friendly tools that estimate the economic impacts of constructing and operating power generation and solar plants at the local and state levels. JEDI constructs profiles of investments during different phases of the project cycle, and allows demonstration of employment and economic impacts that are likely during construction and operation phases, and allows one to differentiate between local and non-local job-creation activities. Local spending results from using local labour, such as concrete pouring jobs, services such as engineering, legal or design, materials and other components. The user can replace these default values

with project-specific information, such as costs and expenditures, financing, taxes, and local share of spending (NREL, 2016).

Job estimates are expressed as FTEs, or job-years, as well as average annual jobs per year. One FTE job (or job-year) is full-time employment for one person for the duration of a year. Three FTEs could therefore be made up either one full-time job for three years or three full-time jobs for one year. Earnings are the total payroll costs, including wages, salary compensation, and benefits paid to workers. Economic output is the sum of all economic activity (value of production for all industry sectors) resulting from the investments in the solar generation facilities (NREL, 2016).

Two crucial points have to be paid attention while analyzing. First, it is not possible and logical to build a 2,750 MW size (250 MW established power has been removed from 3,000 MW target) solar energy power plant in a single area. The first reason for that is the difficulty in finding a field size (21,350,000 square meters) which may support that much established power in a single region of Turkey. Second, the increase in national income and employment may be much more if solar energy power plants are planned to be fulfilled in 55 different regions instead of a single area. Third, analyzed data belongs to California province of the US. Therefore, instead of the solar radiation value of 7.65 kWh / m2 / day, which is the model of California, the average value of 3.60 kWh / m2 / day, which is the Turkey average determined by the Ministry of Energy, is defined. The following section presents the estimates of the jobs, earnings, and output supported during the construction period of the analyzed systems.

4. 3. 1. Construction Period Jobs, Earnings, and Economic Output

For the construction phase, the impacts are broken out by project development and on-site labor impacts, including construction labor and construction related services, local revenue and supply chain impacts, and induced impacts. Table 3 shows a summary of jobs and economic impact for a 2,750 MW solar power plant.

Table 3: Estimates of the Construction Period Gross Direct and Indirect Jobs, Earnings,
and Economic Output Supported by 2750 MW Solar Power Plant

During construction period	Jobs	Earnings (Million $)	Output (Million $)
Project Development and Onsite Labor Impacts	30,233	$3,378	$4,365
Construction and Interconnection Labor	22,838	$2,778	
Construction Related Services	7,395	$600	
Equipment and Supply Chain Impacts	19,595	$1,011	$4,322
Induced Impacts	14,583	$561	$1,757
Total Impacts	**64,412**	**$4,951**	**$10,443**

Notes: (i) Earnings and Output values are millions of dollars in year 2009 dollars. Jobs are full-time equivalent for one year, (ii) Plant workers includes field technicians, administration and management, (iii) The analysis does not include impacts associated with spending of plant "profits.", (iv) Totals may not add up due to independent rounding.

The results indicate that during the construction period (12 months), the project supports 30,233 direct full-time equivalent (FTE) jobs[5] (associated with project development and all onsite field services), and 19,595 indirect FTE jobs (associated with local revenue and supply chain). In addition, the construction of the project is expected to generate 14,583 induced FTE jobs due to the increased economic activities and demands by direct and indirect workers. In all, project construction is estimated to generate $4,951 million in total earnings and $10,443 million in total economic activity.

4. 3. 2. Operational Period Jobs, Earnings, and Economic Output

Operational period jobs, earnings, and economic output are associated with the O&M of the systems and include the impacts from purchasing equipment and materials and services necessary to keep the installed systems operating as well as spending related to ongoing local revenues. These annual job and economic impacts, shown in Table 3, are expected to be sustained over the lifetime of the systems (20–30 years).

Once the solar plant is up and running, 1,768 full-time plant operations and maintenance jobs (or direct jobs) are estimated to be supported by the annual operation over the entire economic life of the facility. It is expected that 1,003 indirect jobs will be supported through local revenue and supply chain activity and additional 424 induced jobs will be supported through induced impacts. A total of 3,195 FTE jobs are estimated to be supported annually by the solar plant during the 30-year economic life of the facility. Overall, during the operating years it is estimated to generate $178 million in annual earnings and $360 million in annual economic activity.

Table 4: Estimates of the Operational Period Annual Gross Direct and Indirect Jobs, Earnings, and Economic Output Supported by 2750 MW Solar Power Plant

During operating years (annual)	Jobs	Earnings (Million $)	Output (Million $)
Onsite Labor Impacts	1,768	$114	$114
Local Revenue and Supply Chain Impacts	1,003	$46	$192
Induced Impacts	424	$17	$53
Total Impacts	3,195	$178	$360

Notes: (i) Earnings and Output values are millions of dollars in year 2009 dollars. Jobs are full-time equivalent for one year, (ii) Plant workers includes field technicians, administration and management, (iii) Economic impacts "During operating years" represent impacts that occur from plant operations/expenditures, (iv) The analysis does not include impacts associated with spending of plant "profits.", (v) Totals may not add up due to independent rounding.

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[5] Job calculations are based on a full time equivalent (FTE) basis for a year. One FTE job = 2080 hours worked in a year by one person full time or several persons part-time.

5. Concluding Remarks

Currently, Turkey does not have an international competitive solar energy manufacturing industry. It has, however, a good potential to create one. The nature of the process of acquiring higher technological capabilities is such that a country trying to catch up with a more technologically advanced country needs to set up and protect its industries in which it does not have comparative advantage. Given the serious market and systemic failures, there are positive roles that state intervention can play in providing or coordinating investments in the necessary infrastructure and complementary inputs.

Producing electricity from sun may provide huge benefits. Creation of a domestic solar energy manufacturing industry in Turkey would not only help to create a low-carbon economy and cleaner environment, but also increase the security of energy supply by reducing the dependence on imported oil and gas. An additional benefit, which is particularly important for this paper, is the high employment potential within a rising industry. Solar energy production is highly labor-intensive. Therefore, solar energy sector may reduce unemployment in the country significantly. Due to the decreasing capital costs of solar power and the potentially increasing fossil fuel prices over the long-term, solar power is likely to become very competitive compared to the conventional resources of electricity generation. Hence, it appears that utilization of solar energy with an ultimate aim of creating a locally owned domestic manufacturing industry is a right strategy for Turkey.

Turkey has recently realized the importance of renewable energy investments and has set the goal of reaching 3000 MW installed power until 2023 for solar energy investments. In our work, we have analized the amount of additional employment to be provided by additional solar energy investments with the assumption that 2023 target is achieved. The results of the analysis shows that, if Turkey actualizes its 2023 target for solar energy investment, a respectable amount of employment can be created. The direct employment amount is expected to be nearly 32,000 and worth of production increase might be 4,365 million $. If indirect and induced production are included in this amount, the total production volume may reach 10,443 million dollars. A total of 3,195 FTE jobs are estimated to be supported annually by the solar plant during the 30-year economic life of the facility. Overall, during the operating years it is estimated to generate $178 million in annual earnings and $360 million in annual economic activity.

Unfortunately, solar energy investments, which have a high potential for employment, do not attract much interest in Turkey. It is imperative for the government to make more efforts and to direct the market in this direction in order to increase the production of solar energy and to improve the sector. Blending regulations, tax incentives, government purchasing policies and other measures are needed to support solar energy production. It would seem a wise investment to strengthen the related frameworks, institutions and policies. Stability and continuity of government support and clear demonstration of political will are critical, even if the policy mixture, itself, is changed over time. The effectiveness of policies in promoting solar energy production will depend on their design, enforcement, how well they address national circumstances and the extent to which they are consistent and sustained.

The experiences of several countries show that, when designed properly, feed-in tariffs and RPS-based mechanisms can effectively spur the development of the solar energy sector. Feed-in tariffs are simpler to administer and enforce, may better ensure local industry infrastructure development, can set the stage for price reductions by nurturing cost reductions. In a nascent market, a feed-in tariff can minimize contracting, development, financing and inter-connection hassles. Such ease of market entry is especially important at the initial stages of solar industry development in Turkey for the less well-financed and smaller players in the industry.

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5

Do Capital Requirements in Basel III Restrict the Financing of Green Economy? A Case Study of a Turkish Bank

Övünç Gürsoy

Abstract

This chapter tries to explore how the role of a bank in supporting a green economy can be improved in an environment where banks are challenged by Basel III requirements. Basel standards do not differentiate green loans from other corporate loans in terms of risk weightings. The authors argue that Basel III requirements discourage the financing of sustainable economic activities. Sekerbank, which pioneered Turkey's first microfinance lending model, is examined. The bank's capacity to expand financing for green projects after Basel III implementation is focused. The authors found that if risk weightings of green loans were dropped to 50% from 100%, Sekerbank's capital adequacy ratio (CAR) would be 4 percentage points higher. This chapter suggests that risk weightings of green loans should be relaxed in order to encourage sustainable development.

Keywords: Sustainable finance, Green loans, Banks, Basel III, Capital adequacy

Introduction

Sustainable finance refers to any form of financial service integrating environmental, social and governance criteria into the business or investment decisions for the lasting benefit of both clients and society at large (UNEP, 2016). Green finance is a broad term that can refer to financial investments flowing into sustainable development projects and initiatives, environmental products, and policies that encourage the development of a more sustainable economy (Hohne et al., 2012). Admittedly, the context of

green finance differs for many countries; however, developing countries, with immature financial systems, face certain challenges in financing green projects. The connection between conventional banking and sustainable development began with the greening of banks in the 1980s, though some specialized social and environmental banks were already founded in the early 1970s (Weber, 2013). Banks play a major role in providing low-cost, long-term financing support for green projects. Of course, banks may take excessive risks, which lead to a collapse of economies and financial crises. In order to alleviate the intensity of global crises Basel standards were introduced in 1988.

The Basel Committee was established by the central bank governors of the G10 countries in 1974 soon after serious problems were experienced in international currency and banking markets. The main aim of Basel regulations is to measure and evaluate the capital adequacy of the banks and to decrease the intensity of global financial crises, if not avoidable (CISL & UNEP FI, 2014). Besides, Basel regulations target at enhancing financial stability by improving the quality of banking supervision worldwide, and improving effective risk management and market discipline.

Basel I required banks to hold a minimum amount of capital against their risk-weighted assets (RWAs). In 1999, Basel II was introduced to cover the weaknesses of Basel I and improve risk measurement and management at banks. Basel II emphasized the use of risk weightings for banks to set the riskiness of their assets through Pillar 1 "Minimum Capital Requirements". Later, it was experienced that the risk weightings of most banks were poor indicators of the financial risks to which banks were exposed. In response to the 2007-2008 financial crises Basel III came into light. However, Pillar 1 of Basel III does not make any distinction between loans for green projects and other corporate loans in terms of risk weightings. Thus, green loans consume a bank's capital as much as other corporate loans.

Green loans could be defined as bank loans distributed for financing renewable energy, energy efficiency, agricultural development and small and medium-sized enterprises (SMEs) productivity. They promote environmentally responsible investments and stimulate low-carbon technologies, projects, industries and businesses.

That being said, in many countries, options for green finance are inadequate due to barriers in demand or supply. From the supply side perspective, this chapter argues that unless capital requirements for green loans are relaxed, long-term project finance for environmentally sustainable economic activities might be restricted. The authors believe that Basel standards could support sustainable development by setting risk weights of green loans lower than other corporate loans. This could, in turn, reduce capital consumption, keep CARs high, and thus incentivize banks to channel their capital to environmentally and socially sound projects.

It is a well-known fact that today, air, soil and water pollution are all quite severe. This makes extensive economic growth at the cost of natural resources and the environment difficult to sustain. A study by the United Nations forecasts that the annual cost to the global economy of maintaining the current scale of unsustainable economic activity will reach nearly $28.6 trillion by 2050, equivalent to 18 per cent of global

GDP (UNEP, 2011). Meanwhile, estimates indicate that around $1 trillion of additional investment in new green infrastructure in energy, transport, buildings and industry is needed annually until 2030 (WEF, 2013). Therefore, countries have to emphasize the balance between economic development and environmental protection by prioritizing green development as a national strategy and introducing various relevant policies and regulations accordingly.

This chapter is organized as follows: the first part includes a brief literature review and examines previous research on the critical topics of "green finance" and "Basel III". The second part discusses capital requirements in Basel III and the impact of Basel III on capital adequacy ratios of Turkish Banks. In the third part, the research methodology is introduced and "Sekerbank" is studied as a case. The bank's capacity to expand its financing for green projects after Basel III implementation is further analysed. The fifth part concludes with some recommendations and comments for further research.

Literature Review

Green finance encompasses all financial products and services offered in order to promote environmentally responsible investments and stimulate low-carbon technologies, projects, industries and businesses (PWC NEP FI, 2014). As far as green loans are concerned, they are very similar to standard loans. The only difference is that the lender distributes these loans for financing green projects, which typically include renewable energy, energy efficiency and agricultural development. These loans basically support businesses and industries with a positive impact on the environment and society (IFC, 2016). As for Sekerbank's case, loans distributed for financing renewable energy, energy efficiency, agricultural development and SME productivity are classified as green loans.

The authors think that sustainable development through green finance has to be placed at the heart of the financial system. In fact, efforts to build bridges between the financial system and sustainable development have recently gained considerable momentum. In 2015, for example, private investment in renewable energy comprised almost two-thirds of the net additions to global power capacity, and the market size of electric vehicles expanded 60% (Bloomberg, 2016). Besides, renewable energy sources have many economic benefits to many countries, such as reduction in greenhouse gas emissions, diversification of energy supplies and reduction in foreign energy dependency (Akdogan, 2016).

Of course, banks play an important role in financing sustainable economic development. Their capital structures and risk taking behaviors are vital for the overall health of world economies. Their compliance with Basel standards gives at least some assurance to public and their stakeholders who are fearful of their collapse. Effective implementation of Basel III will demonstrate to regulators, customers, and shareholders that the banking system is recovering well from the global financial crisis of 2008 and has been developing the resilience to future shocks (Mahapatra, 2012). Certainly, the role of financial regulators is to ensure that excessive risks that would threaten the stability of the financial system are not taken.

This chapter argues that Basel III's Pillar 1 "Minimum Capital Requirements" discourages the financing of environmentally sustainable economic activities. A study on environmental risks in Basel III conducted by the University of Cambridge has also tried to answer the same question through interviews with some bank executives and regulators around the world (CISL & UNEP FI, 2014). Based on interviews they have concluded that the economic and political riskiness of the project was more important than Basel III's stricter capital requirements in financing green projects. Some interviewees also stated that lowering capital requirements to benefit environmentally sustainable economic activities might create an undesirable trade-off between financial stability and environmental sustainability.

First of all, the authors agree that economic and political riskiness of a project is a key factor in lending decisions; however, they believe capital requirements are also equally important. Indeed, in this chapter it is shown that a bank's capacity to expand its financing for green projects increases if capital requirements are eased for green loans.

Second, the authors acknowledge that riskiness of a green loan should not be overlooked. Besides, it is suggested that a distinction between green loans and other corporate loans in terms of risk weightings should be made, and risk weights of green loans should be reduced by regulators. This might incentivize banks to support a greener economy as their CARs will be less impacted from distributing these loans.

Discussions on Basel III and its implications

The Basel Committee was established by the central bank governors of the G10 countries in 1974 soon after serious problems were experienced in international currency and banking markets. The main aim of Basel regulations is to measure and evaluate the capital adequacy of the banks and to decrease the intensity of global financial crises, if not avoidable (CISL & UNEP FI, 2014). Besides, Basel regulations target at enhancing financial stability by improving the quality of banking supervision worldwide, and improving effective risk management and market discipline.

Basel I was adopted in 1988, which stipulated that internationally banks must hold a minimum amount of capital against their RWAs. It also aimed at promoting an internationally level playing field for cross border banking (Norton, 1995). Actually, Basel I achieved its objective of increasing the amount of regulatory capital in banks; however, it contained many national discretions, loopholes and incentives for banks to make riskier short-term loans and to transfer less risky assets off their balance sheets (Goodhart, 2011).

Basel II was suggested in 1999 to cover the weaknesses of Basel I and established the "three pillars" concept, namely minimum capital, supervisory review, and market discipline. These three pillars are created to support each other and to motivate banks to improve their risk measurement and management. Basel II emphasized the use of risk weightings for banks to set the riskiness of their assets through Pillar 1 "Minimum Capital Requirements". Assets with lower risk weightings generally attract lower capital charges, whereas assets with higher risk weightings generally attract higher capital charges.

Later, it was experienced that the risk weightings of most banks were poor indicators of the financial risks to which banks were exposed. The Basel Committee responded to the 2007-2008 financial crises by changing Basel II, which became known as Basel III. Although Basel III is not legally binding, most countries have adopted it. Some countries choose what provisions to comply with, while others impose stricter standards.

Turkish banks have started to adopt Basel III capital requirements from 2014 and the full implementation will be effective from January 2019, as is the case in most of their emerging market counterparts. Accordingly, capital risk weightings of loans, Basel III capital requirements and the impact of Basel III on capital adequacy ratios of Turkish Banks are discussed in the next sections.

Basel III Does Not Differentiate Green Loans from Others

Pillar 1 of Basel III does not make any distinction between loans for green projects and other corporate loans in terms of risk weightings. In this chapter, it is argued that unless capital requirements are relaxed, long-term project finance for environmentally sustainable economic activities might be restricted. The authors believe that Basel standards could support sustainable development by setting risk weights of green loans lower than other corporate loans. This could, in turn, reduce capital consumption, keep CARs high, and thus incentivize banks to channel their capital to environmentally and socially sound projects.

Turkish banks use only the public ratings of "Fitch Ratings International Ratings Institution" in determining risk weightings of loans. The below table shows risk weights of different loan categories, which is also in line with the Basel III standards and local banking regulation.

It can be seen from the below table that Basel standards do not make any distinction between green loans and other corporate loans in terms of capital risk weightings. As Turkey rated "BBB-" by Fitch Ratings, corporate loans have 100% risk weight in banks' capital regardless of their type, collaterals, maturity or probability of default. This obviously curbs the overall appetite of banks to distribute project loans to corporates, not to mention the green project finance loans.

Besides the negative supply impact, this also leads to less demand from corporates due to a high cost of financing as banks pass on the full charge on their capital to borrowers by setting higher interest rates on corporate loans. The authors suggest that capital requirements for green loans should be eased to increase the supply of long-term project finance for environmentally sustainable economic activities, and thereby making them more affordable for borrowers in terms of costs.

Table 1. Capital risk weights by loan segments and assigned ratings

Credit Quality Grade	Risk Rating	Exposure to Central Banks	Exposure to Non-Commercial Undertakings	Exposures to Banks and Brokerage Houses		Corporate Receivables
				Remaining Maturities Less Than 3 Months	Remaining Maturities More Than 3 Months	
1	AA- / AA / AA+ / AAA	0%	20%	20%	20%	20%
2	A- / A / A+	20%	50%	20%	50%	50%
3	BBB- / BBB / BBB+	50%	100%	20%	50%	100%
4	BB- / BB / BB+	100%	100%	50%	100%	100%
5	B- / B / B+	100%	100%	50%	100%	100%
6	C / CC / CCC- / CCC / CCC+ / D	100%	100%	150%	100%	100%

Source: Banking Regulation and Supervision Agency (BRSA)

Capital Looks Tight Going Forward

Turkish banks have started to adopt Basel III capital requirements from 2014 and the full implementation will be effective from January 2019, as is the case in most of their emerging market counterparts. The authors think that most Turkish banks need capital in the near term to comply with Basel requirements in 2019.

In accordance with Basel III, the minimum common equity Tier I (CET1) requirement was set at 4.5% of RWAs and an additional Tier 1 of 1.5% was determined, resulting in a total Tier 1 capital of 6.0% of RWAs. In 2016, certain safety buffers were also introduced, climbing gradually until 2019. The "capital conservation buffer" was set at 0.625% for the first year (January 2016), which will rise gradually to 2.5% in January 2019. Additionally, the "systemic risk buffer (SIFI)" was introduced, which allows the banking regulator to impose a capital surcharge of up to 3% of RWAs for those banks it deems systematically important. The BRSA categorized the systematic importance of Turkish banks into three groups (i.e., Group 1: 1%, Group 2: 1.5%, Group 3: 2.0%), where large banks in the system are classified under Group 3 and will phase in the D-SIB, starting at 0.5% and climbing to 2% by end-2019.

On the other hand, the banking regulator has set the "countercyclical buffer (CCyB)" at 0%, determining the key parameter that will trigger the implementation of this buffer as the "credit-to-GDP gap" (i.e., the

difference between the credit-to-GDP ratio and its long-term trend). If the credit-to-GDP gap in the Turkish banking system exceeds 3% (the requirement is stricter at 2% under Basel III), a countercyclical buffer will be introduced, the ceiling of which would be 2.5%. All in all, with the inclusion of capital conservation and systemically important bank buffers, the core Tier 1 capital and Tier 1 capital thresholds will climb to 9% and 10.5% for large banks in 2019 (excluding the CCyB, which is currently set at 0%). Accordingly, the CAR threshold will rise to 12.5%.

Table 2. Turkish banks – Capital thresholds (2016 – 2019)

CET1	2016	2017	2018	2019
Overall threshold	5.6%	6.8%	7.9%	9.0%
Minimum	4.5%	4.5%	4.5%	4.5%
Conservation buffer	0.6%	1.3%	1.9%	2.5%
Counter cyclical buffer	0.0%	0.0%	0.0%	0.0%
SIFI buffer	0.5%	1.0%	1.5%	2.0%
Tier I	**2016**	**2017**	**2018**	**2019**
Overall threshold	7.1%	8.3%	9.4%	10.5%
Minimum	6.0%	6.0%	6.0%	6.0%
Conservation buffer	0.6%	1.3%	1.9%	2.5%
Counter cyclical buffer	0.0%	0.0%	0.0%	0.0%
SIFI buffer	0.5%	1.0%	1.5%	2.0%
CAR	**2016**	**2017**	**2018**	**2019**
Overall threshold	9.1%	10.3%	11.4%	12.5%
Minimum	8.0%	8.0%	8.0%	8.0%
Conservation buffer	0.6%	1.3%	1.9%	2.5%
Counter cyclical buffer	0.0%	0.0%	0.0%	0.0%
SIFI buffer	0.5%	1.0%	1.5%	2.0%

Source: BRSA

RWA growth might be under pressure

Since 2012, the CAR and Tier 1 capital ratios have already fallen as much as 200bps and 130bps, respectively, through sharp erosion in available-for-sale securities reserves and the increase in risk-weighted assets. In addition, as discussed above, Basel III is expected to exert extra pressure on CAR. Unconsolidated CAR and Tier 1 capital ratios of Turkish banks averaged at 16.0% and 13.8% as of September 2016 and are still comfortably above the thresholds. That being said, heading to tighter capital standards, Turkish banks may focus more on capital efficiency, RWA optimization, and more profitable segments to preserve capital. Admittedly, those with stronger Tier 1 capital ratios could be more comfortable supporting the loan growth strategies and may have additional time for improving capital efficiency and RWA optimization.

With capital thresholds expected to increase 4.5 percentage points until 2019, along with the phasing-in processes of safety buffers, some Turkish banks may unlikely sustain their historical growth rates going forward. This could also mean the banks will be less supportive of the overall national economy, as well.

RWAs are foreseen increasing at a slower pace than in the post-global crisis period. In the meantime, the growth in core capital could undershoot the increase in RWAs on average, due to a slower increase in retained earnings.

Figure 1. Turkish banks – CAR
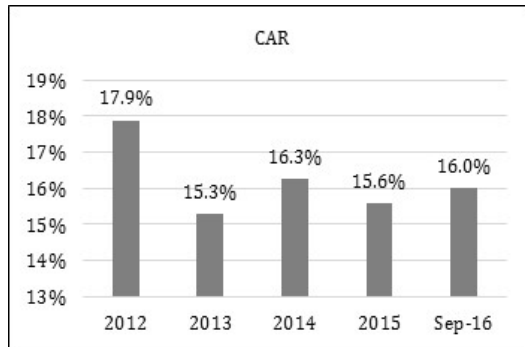
Figure 2. Turkish banks – Tier I ratio
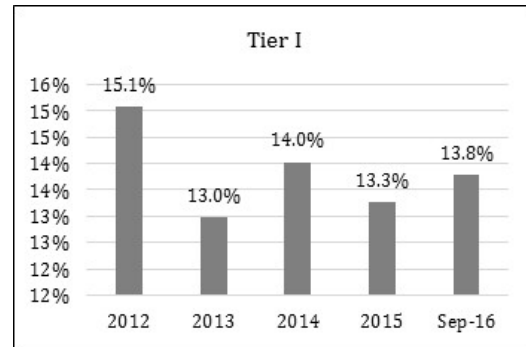
Source: BRSA, unconsolidated   *Source: BRSA, unconsolidated*

It can be understood from the above discussion that banks capacity to expand financing for green projects after Basel III implementation set to decline as their CARs are under pressure. Unless capital requirements for green loans are eased by local government agencies, long-term project finance for environmentally sustainable economic activities may be restricted and opportunities for green finance such as renewable energy, energy efficiency, agricultural development and SMEs productivity could be in jeopardy. The authors believe that local governments should aim to encourage more investment in green assets and better financing for environmentally sustainable economic activity.

Research Methodology

In this chapter, case study method is used to suggest that Basel III requirements related to risk weightings of green loans should be relaxed in order to encourage sustainable development. Sekerbank, which pioneered Turkey's first microfinance lending model and assigns a significant part of its loan portfolio to sustainable development projects, is studied as a case.

Sekerbank's capacity to expand its financing for green projects such as renewable energy, energy efficiency, agricultural development and SMEs productivity after Basel III implementation is examined. The sensitivity of Sekerbank's CAR to changes in risk weighting of green loans is further analyzed. The authors try to explore whether the bank's capacity to expand its financing for green projects after Basel III implementation could be improved by lowering risk weights of green loans.

Sekerbank in Brief

The bank has an equity of TRY 2.4bn, asset size of TRY 22.8bn and loans of TRY 16.3bn as of September 2016. If we have a look at the composition of assets and liabilities (Figure 3), we see that loans make up a huge 73% of total assets. On the other hand, among loan categories (Figure 4), corporate and commercial loans comprise 64% of total loans and thus constitute the highest proportion in the loan mix, followed by commercial instalment loans (27%). Therefore, commercial loans comprise 91% of the loan book, which is in line with the mission of the bank as the financier of micro businesses, agriculture, and SMEs.

As for capital adequacy, Sekerbank's Basel III compliant CAR stands at 12.9% as of September 2016 and Tier I ratio at 12.4%. With capital thresholds expected to increase 4.5 percentage points until 2019, along with the phasing-in process of safety buffers, minimum CAR would be 12.5% and minimum Tier I at 10.5% for banks in Turkey. Admittedly, the current CAR and Tier I ratios of Sekerbank are slightly above the minimum thresholds set by Basel III. However, the main concern is the bank's capacity to expand its financing for green projects after Basel III implementation. Heading to tighter capital standards, Sekerbank has to focus more on capital efficiency, RWA optimization, and more profitable segments to preserve capital. The bank could be less comfortable supporting the loan growth; therefore, its financing for sustainable development projects may be restricted.

Figure 3. Sekerbank's Asset & Liability Mix
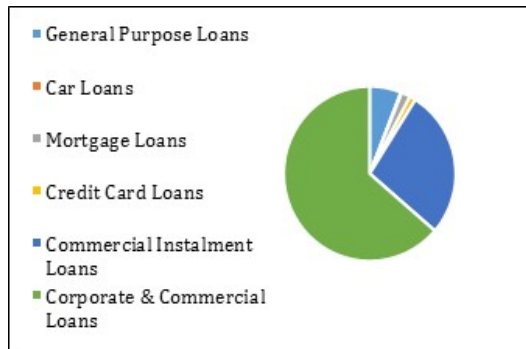
Source: Sekerbank, Sept. 2016, unconsolidated

Figure 4. Sekerbank's Loan Mix
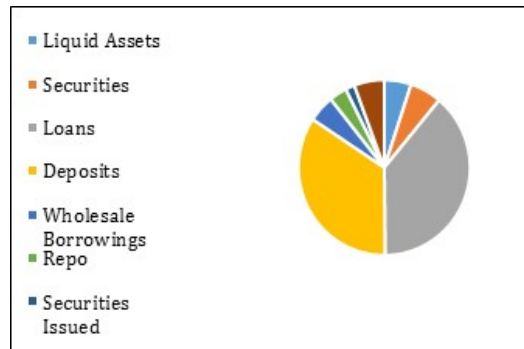
Source: Sekerbank, Sept. 2016, unconsolidated

Research Results

Loans distributed for financing renewable energy, energy efficiency, agricultural development and SME productivity are classified as green loans in this analysis. According to Sekerbank's sustainability report as of 2013, 70% of foreign funds acquired from international markets are used for financing agriculture, trade, and SMEs.

This actually gives an important insight regarding the funding structure of loans. For purpose of the analysis, it is conservatively assumed that 60% of commercial loans are used for green finance by Sekerbank.

In light of the results, if risk weightings of green loans were dropped to 50% from 100%, Sekerbank's CAR would be almost 4 percentage points higher, and this would partially offset the pressure of Basel III on the bank's capital.

The result of the analysis further prompts us to suggest that Basel III requirements related to risk weightings of green loans should be relaxed in order to encourage sustainable development. This could, in turn, reduce capital consumption, keep CARs high, and thus incentivize banks to channel their capital to environmentally and socially sound projects.

Table 3. Sensitivity Analysis of Sekerbank's CAR

TRY thousands, unless otherwise stated			Current 100% risk weight	Scenario with 50% risk weight	CAR support from lower risk weight
(III+II-VI)/VIII		CAR	12.9%	16.7%	3.8%
I/VII		Tier I	12.4%	16.1%	3.6%
	I	Tier I capital	2,354,222	2,354,223	
	II	Deductions from Tier I capital	38,316	38,316	
	III	Net Tier I capital	2,315,906	2,315,907	
	IV	Tier II capital	150,774	150,775	
	V	Total capital	2,466,680	2,466,682	
	VI	Deductions from total capital	19,398	19,398	
	VII	RWA	18,935,445	14,652,008	
	VIII	Total Loans	15,690,244	15,690,245	
VIII*91%	IX	Commercial Loans	14,278,122	14,278,123	
IX*60%	X	Green Loans	8,566,873	8,566,874	
	XI	Risk-weighted Commercial Loans	8,566,873	4,283,437	

Source: Sekerbank's unconsolidated financial statements (September 2016)

Conclusion

As financial regulators are assessing standards and rules to assure financial stability and a well-running economy, they should aim to encourage more investment in green assets. This paper has shown that Basel III's Pillar 1 "Minimum Capital Requirements" discourages the financing of environmentally sustainable economic activities by reducing banks' capacity to expand financing for green projects.

Sekerbank, which pioneered Turkey's first microfinance lending model, is examined in this chapter. The bank is expected to be less comfortable supporting the loan growth and its financing for sustainable development projects could be restricted due to requirements of Basel III. In light of the analysis, it is shown that if risk weightings of green loans were dropped to 50% from 100%, Sekerbank's CAR would be almost 4 percentage points higher, and this would partially offset the pressure of Basel III on the bank's capital. Thus, the bank's capacity for green finance such as renewable energy, energy efficiency, agricultural development and SMEs productivity could increase.

On the back of our analysis, the chapter suggests that Basel III requirements related to risk weightings of green loans should be relaxed in order to encourage sustainable development. This could, in turn, reduce capital consumption, keep CARs high, and thus incentivize banks to channel their capital to environmentally and socially sound projects.

Our analysis clearly has profound implications. Further research is necessary to assess the feasibility of its implementation. In fact, in this chapter, only one Turkish bank is examined. Sekerbank is a small Turkish bank in terms of asset size. For this reason, it does not represent the whole Turkish banking system. Further studies may focus on big scale banks operating in Turkey or different regions in the world. This constitutes a limitation to this research. Besides, the profitability impact of distributing green loans is not considered in this chapter. The authors focused only on the capital adequacy impact and risk weights of green loans. A further study could be done on profitability by collecting data on costs and asset quality trends of green loans.

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6

The Relationship between Corporate Social Performance and Corporate Financial Performance: Evidence from Turkey

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Abstract

As the Internet has become the predominant mode of communication to disclose information about responsible business practices to various stakeholders, corporate social responsibility (CSR) literature has begun to discuss the potential benefits of using corporate websites to communicate CSR-related information to internal and external audiences. This relatively new strand of the literature flourishes alongside the long-standing tradition of examining the impact of CSR on organizations. This study aims at binding these two streams of research together by using CSR disclosures on corporate websites as a proxy for corporate social performance (CSP) to investigate its cross-sectional relationship to corporate financial performance (CFP). The investigation includes Turkey's largest publicly held industrial enterprises. Results of regression analyses indicate that the level of CSP is not associated with the level of CFP, and vice versa. This study provides support for the view that CSP-CFP relationship might be weak for firms operating in developing economies.

Keywords: Corporate Social Responsibility, Corporate Websites, Corporate Social Performance, Corporate Financial Performance, Turkey

Introduction

Contributing to social and environmental causes constitutes an important agenda issue for many organizations, albeit for a variety of reasons. Some organizations believe acting responsibly can have a positive impact on the bottom line, while others expect to enhance their reputations in the eyes of many different stakeholders by engaging in socially responsible activities. Accordingly, studies in the corporate social responsibility (CSR) literature have indicated that CSR-driven organizations increase demand for their products or services by attracting socially aware customers (e.g., Peloza, Loock, Cerruti, & Muyot, 2012; Sharma & Mehta, 2012), are more attractive to prospective employees with multiple job choices (e.g., Albinger & Freeman, 2000; Backhaus, Stone, & Heiner, 2002; Turban & Greening, 1996), and improve organizational members' self-esteem and work attitudes (e.g., Dutton, Dukerich, & Harquail, 1994; Maignan & Ferrell, 2001; Peterson, 2004). The vast majority of research, however, has been concerned with examining the direct relationship between corporate social performance (CSP) and corporate financial performance (CFP), without, though, being able to provide consistent empirical evidence due to the methodological difficulty of developing appropriate objective criteria for measuring both variables (Cochran & Wood, 1984; Margolis & Walsh, 2003). Therefore, while some studies found a positive relationship between them (e.g., Moskowitz, 1972; Parket & Eilbirt, 1975; Sturdivant & Ginter, 1977), others found a neutral relationship (e.g., Abbott & Monsen, 1979; Alexander & Buchholz, 1978; Aupperle, Carroll, & Hatfield, 1985), and still others suggested a negative relationship (e.g., Shane & Spicer, 1983; Vance, 1975).

A recently developing strand of CSR literature, on the other hand, has recognized the benefits of making use of the Internet to disclose CSR-related information to internal and external audiences as it has become the predominant mode of access to stakeholder groups, regardless of the motivations behind the focus on CSR. This body of work has highlighted a number of advantages websites offer over the traditional media such as annual reports and brochures. It has been noted that websites allow for tailoring messages to different needs and expectations of various stakeholders (e.g., Dawkins, 2004) and publicizing detailed and up-to-date information less expensively and faster than ever before (e.g., Wanderley, Lucian, Farache, & Filho, 2008) as well as stimulate direct dialogue between organizations and their stakeholders through interactive features such as opinion forms and questionnaires (e.g., Moreno & Capriotti, 2009).

Considering the growing dominance of the use of the Internet in corporate communications about responsible business conduct and the literature's concern about assessing the direction and the strength of the relationship between CSP and CFP, the objective of this research study is to investigate this relationship by using CSR disclosures on corporate websites as a proxy for CSP. Although content analysis is one of the generally accepted methods of measuring CSP (Cochran & Wood, 1984), earlier works have mostly gathered data from traditional media to examine the relationship between CSP and CFP (e.g., Bowman & Haire, 1975; Ingram, 1978; Verschoor, 1998). Therefore, this research aims to contribute to the extant literature by operationalizing CSP in a way that has been largely neglected by research seeking to explore its relationship to CFP. In other words, the focus of research is on whether there is a cross-sectional relationship between the level of CSR communications on corporate websites and CFP.

This paper is divided into five main sections. The following section outlines the conceptual framework and presents our hypotheses regarding the relationship between CSP and CFP. The two subsections of the next section provide a discussion of methods of data collection and analysis. Then findings and evaluations are presented in the following section. Finally, conclusion is offered.

Conceptual Framework and Hypothesis Development

Despite the ever-increasing attention towards CSR, the concept continues to lack a commonly accepted definition. It is often assumed that the modern debate on the subject began with Bowen's (1953, p. 6) argument that businessmen have an obligation 'to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society'. Since then, scholars have thoroughly examined the concept and have provided various CSR definitions. 1970s, 1980s, and 1990s witnessed a surge of academic interest in CSR topics, in part because some powerful models of CSP were developed building and improving on earlier work (see, for example, Carroll, 1979; Wartick & Cochran, 1985; Wood, 1991). Identifying what dimensions CSP embodied occupied organizational theorists during these periods.

At the same time, interest in investigating the CSP-CFP relationship emerged. In a meta-analytic review, Margolis, Elfenbein, & Walsh (2007) reported that one hundred and sixty-seven studies examined CSP-CFP linkage between 1972 and 2007. Although a comprehensive appraisal of the findings of thirty-five years of research indicated a mildly positive relationship between CSP and CFP (Margolis et al., 2007), empirical studies, in fact, offered contradictory findings, as we have noted above.

With Freeman's (1984) stakeholder theory, researchers turned their attention to the idea that organizations have responsibilities not only to their shareholders, but also to a broader range of stakeholder groups. Hence, the financial success of a business depends on building and maintaining positive relationships with these groups that hold a stake in the organization. In our endeavour to explore the CSP-CFP relationship, we draw on the tenets of stakeholder theorists' thinking to classify groups of stakeholders that organizations address on their websites according to financial and non-financial constituencies.

In this study, we do not seek to establish a cause-effect relationship between corporate social and financial performances. This is because it could be just as likely that financially stronger organizations commit greater corporate resources to socially responsible activities as it could be that more responsible organizations achieve superior financial performance (Bowman & Haire, 1975; Sturdivant & Ginter, 1977; Waddock & Graves, 1997). Instead, we investigate an association between the two variables. We propose the following hypotheses to investigate the CSP-CFP relationship in both directions:

Hypothesis 1: Higher levels of CSP are positively related to CFP.

Hypothesis 2: Higher levels of CFP are positively related to CSP.

Research Methodology

Sample and Data Collection

The İstanbul Chamber of Industry's ranking of Turkey's largest industrial enterprises for the year 2012 was used as the sampling frame for this study. This list ranks industrial enterprises by their production-based sales. CSP data were collected for publicly held firms since CFP data were available for those enterprises. Moreover, we only included firms that ranked in the top 250 in the list because we could hardly discern CSR-related information on corporate websites of the remaining firms. A total of 57 enterprises satisfied these conditions and were included in the sample.

Measurement

In the current study, CSP was measured by the level of CSR disclosures on corporate websites. For purposes of content analysis, which was conducted between October 2013 and December 2013, a checklist for two different groups of CSR indicators, i.e. CSR issues and the stakeholder groups, was created based on the review of literature, the investigation of the company websites, and the principles of the United Nations Global Compact (see Table 1). The websites were scanned for CSR-related information and the absence and the presence of information about different CSR issues and for different stakeholder audiences were coded. A category was assigned a score of zero if the website conveyed no information regarding the criterion under analysis, and a category was assigned a score of one if the website provided information regarding the criterion under analysis.

We took into account either actualized CSR projects or explicit statements of doing business or treating stakeholders with a CSR mentality. An example of actualized projects is Vestel's providing a laboratory for a vocational high school located in a city in the southeast of Turkey, which took place in 2012 and aimed to assist the educational programmes in the country. On the other hand, an example of doing business with a focus on CSR is the following statement developed by Coca Cola, which demonstrates an interest in protecting the environment:

We aim to minimize water consumption in our operations, to control our carbon footprint with effective energy consumption and to preserve natural resources with our sustainable packaging processes and high waste management performances.

To make such statements, companies should have previously invested in infrastructures and physical technologies. In a similar vein, an example of treating stakeholders with a focus on CSR is shown by the following statement provided by Erdemir:

All of the job assignments, promotions, and training activities are carried out based solely on merit and objective measures to maintain a discrimination-free working environment.

Again, statements of this kind require well-established practices. Therefore, the projects and the ways of doing business we counted among CSR activities do not offer momentary glimpses of CSP and instead signal progress over a period of time. Since we accepted such projects or statements as CSP indicators and excluded intentions for the future from analysis, our content analysis in 2013 pointed to CSR initiatives companies were recently involved in, especially in the past one year.

For both CSR indicators, we calculated the sum of the scores for each enterprise. Then, we divided the sum of the scores by the total number of criteria (eleven for CSR issues and seven for the stakeholder groups) to express the values as percentages. Lastly, we added up those two ratios to produce a comprehensive CSR measure.

Table 1. CSR Checklist

CSR Issues Addressed on Corporate Websites	Stakeholders Addressed on Corporate Websites
Human Rights	Customers
Labour Standards	Suppliers
Workplace Health & Safety	Employees
Environment	Governmental Institutions
Anti-corruption	NGOs
Product Quality	Shareholders
Education	Society
Charitable Donations	
Support of the Arts & Sports	
Healthcare	
Other	

On the other hand, CFP was measured by one of the most widely used accounting based measures of financial performance, i.e. return on equity (ROE). We preferred accounting returns to investor returns because while the basic idea behind using the former is to focus on how firm earnings respond to different managerial policies, in this case CSR, the basic idea underlying the latter is that returns are measured from the shareholders' perspective (Cochran & Wood, 1984). ROE is measured by dividing net income by owners' equity. In order to calculate ROE, we retrieved companies' financial reports for the year 2012 from Public Disclosure Platform. Considering the way CSP data were collected, it is possible to treat our CSP and CFP data as cross-sectional as they inform us of firm performances (both social and financial) mostly for the same time period.

In addition, since firm size and industry type are two of the variables that have been most frequently controlled for by previous researchers investigating the relationship between CSP and CFP, we decided to include these factors in our analysis. While we used firm size as a control variable and the logarithm of total assets as a proxy for firm size, we employed industry type as a dummy variable coded with 1s and 0s.

We acquired industry type information from Public Disclosure Platform and enterprises operating in similar industries were grouped under one category. The industrial breakdown of the sample is as follows: Twenty of

the enterprises are in metalworking machinery and equipment, technology/defence, and industrial metals; fourteen are in chemicals, petroleum, rubber, and plastics industry; nine are in cement/glass products, mining, other manufacturing, and electric/gas/water supply; eight are providers of food, beverage and tobacco; and six are in textile/leather and paper/publishing.

Results

The CSP-CFP relationship was investigated in both directions and regression analyses were run to test the hypotheses. Table 2 provides descriptive statistics for all the variables used in this study. We conducted a pre-analysis screening procedure to spot any potential outliers both for ROE and CSR. Using outlier labelling rule and graphical methods (i.e. histograms and box plots), we identified one case as an outlier for ROE and deleted it before running the regression analyses. No case appeared as an outlier for the variable CSR.

Table 2. Descriptive Statistics

	Mean	Std. Deviation	Minimum	Maximum	N
CSR	1.282296650717703	.376187502205147	0.415584415584416	2	57
ROE	.145884929626202	.242467556429713	-0.251526695990988	1.66349175792881	57
Log of Assets	19.67584349	2.353613231	13.4352320867378	23.2990349586947	57
Metalworking	.351	.4815	0	1	57
Chemicals	.246	.4343	0	1	57
Cement	.158	.3679	0	1	57
Food	.140	.3504	0	1	57

Three models are proposed to test whether the level of CSP is associated with the level of CFP. In all three models, ROE is the dependent variable. We will for space reasons present the regression results tablewise only for the third model. In the first model, CSR is the only independent variable that enters the regression equation. The model is:

$$CFP = \beta 0 + \beta 1(CSR) \tag{1}$$

where CFP is the dependent variable ROE, $\beta 0$ is the regression constant that is equal to the y intercept of the regression line, $\beta 1$ is the regression coefficient for CSR, and CSR is CSP.

R^2 for the model points to a very small effect size. It suggests that .027 of the variance in CFP is explained by the level of CSR disclosures. The F value is used to decide whether the model as a whole has statistically significant predictive capability. A result is said to be 'statistically significant' whenever $p<.05$. The overall F-test for this model is 1.475 with a p value of .230. This indicates that the level of CSR disclosures on corporate websites does not have statistically significant predictive capability for CFP.

In the second model, ROE is the dependent variable and CSR and firm size are the independent variables. The model is:

$$CFP = \beta_0 + \beta_1(CSR) + \beta_2(Size) \qquad\qquad (2)$$

where CFP is the dependent variable ROE, β_0 is the regression constant that is equal to the y intercept of the regression line, CSR is CSP, size is the logarithm of total assets used as a proxy for firm size, and β_1 and β_2 are the regression coefficients for the independent variables CSR and firm size respectively.

The results of the regression analysis suggest that CSR is still positively related to CFP once we control for firm size. In fact, the effect is larger as the coefficient for CSR has increased. The overall F-test for this model is 1.040 with a p value of .360. Thus, the equation as a whole is not statistically significant in explaining CFP (.360>.05). We also test the individual predictors. CSR has a p value of .162 and the logarithm of assets has a p value of .436. The p values larger than .05 mean that changes in the predictors are not associated with changes in the dependent variable. Therefore, no statistically significant relationship has been found between CFP and CSP.

In the third model, all independent variables (CSR, firm size, and industry type) enter the regression equation to explain some percentage of the variance in ROE. The full model is:

$$CFP = \beta_0 + \beta_1(CSR) + \beta_2(Size) + \beta_3(Metalworking) + \beta_4(Chemicals) + \beta_5(Cement) + \beta_6(Food) \quad (3)$$

where CFP is the dependent variable ROE, β_0 is the regression constant that is equal to the y intercept of the regression line, CSR is CSP, size is the logarithm of total assets used as a proxy for firm size, metalworking is metalworking machinery and equipment industry, chemicals is chemicals, petroleum, rubber, and plastics industry, cement is cement/glass products, mining, other manufacturing, and electric/gas/water supply industry, food is food, beverage, tobacco industry, and β_1, β_2, β_3, β_4, β_5, and β_6 are the regression coefficients for the independent variables CSR, firm size, metalworking, chemicals, cement and food respectively.

The correlation matrix for the variables used in this model and collinearity statistics (i.e. tolerance and variance inflation factor values) prove that no multicollinearity problem is evident. Table 3 illustrates the results of the regression analysis using ROE as the dependent variable and CSR, firm size, and industry type as the independent variables. The R^2 for the model is now .083. An increase of .045 indicates that the fit has moderately improved. The F-test is .735 with a p value of .624. This implies that the proposed relationship between ROE and the set of predictors (CSR, firm size, metalworking, chemicals, cement, and food) is not statistically reliable. Furthermore, all independent variables have p values larger than .05. We conclude that CSP is not positively related to CFP. Thus, we fail to provide support for Hypothesis 1.

Table 3. Regression results from using ROE as the dependent variable and CSR

as the key independent variable when controlling for firm size and industry type

Variable	Coefficient	Std. Error	t stat	P Value
(Constant)	-.218	.214	-1.021	.312
CSR	.083	.054	1.550	.128
Log of Assets	.010	.009	1.120	.268
Metalworking	.027	.062	.441	.661
Chemicals	.085	.066	1.285	.205
Cement	.046	.070	.660	.512
Food	.017	.077	.221	.826
R^2				.083
F				.735
Sig. F				.624[a]

a. Predictors: (Constant), Food, Logarithm of Assets, Cement, Chemicals, CSR Measure, Metalworking

Three additional models are proposed to test whether the level of CFP is associated with the level of CSP. CSR is the dependent variable in these three models. Again, we will offer a table of values only for the regressions results of the third model. In the first model, ROE is the only independent variable that enters the regression equation. The model is:

CSR = β0+β1(ROE)   (4)

where CSR is the dependent variable CSP, β0 is the regression constant that is equal to the y intercept of the regression line, β1 is the regression coefficient for ROE, and ROE is CFP measure.

R^2 of .012 indicates that almost none of the variance in CSP is explained by the level of CFP. The overall F-test for the model is .651 with a p value of .423. We conclude that the equation as a whole is not statistically significant in explaining CSP (.423>.05).

In the second model, ROE remains the principal independent variable. The logarithm of assets also enters the regression equation to control for firm size. The model is:

CSR = β0+β1(ROE)+β2(Size)   (5)

where CSR is the dependent variable CSP, β0 is the regression constant that is equal to the y intercept of the regression line, ROE is CFP measure, size is the logarithm of total assets used as a proxy for firm size, and β1 and β2 are the regression coefficients for the independent variables ROE and firm size respectively.

The R^2 for the model is now .156. The fit has improved over the simpler model. The F-test is 4.983 with a p value of .010. This test statistic suggests that the model as a whole is significant and these two independent variables together explain some percentage of the variance in CSP. Next, we consider if both variables uniquely explain any amount of the variance in the dependent variable. We notice that although the

regression coefficient is positive, ROE does not explain any amount of variability of the level of CSR disclosures (p value=.395). However, firm size is useful for explaining CSR (p value=.004). The negative regression coefficient for the logarithm of assets implies that as the firm size increases, the level of CSR disclosures tends to decrease.

In the last model, all independent variables (ROE, firm size, and industry type) enter the regression equation to assess their degree of association with CSP. We produce a summary of the variables used in all of the models in Table 4.

Table 4. Variables Used in Regression Models

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ROE	DV*	DV	DV	IV	IV	IV
CSR	IV**	IV	IV	DV	DV	DV
Firm Size		IV	IV		IV	IV
Industry Type			IV			IV

*Dependent variable
**Independent variable

The last model is:

CSR= β0+β1(ROE)+β2(Size)+β3(Metalworking)+β4(Chemicals)+β5(Cement)+β6(Food)   (6)

where CSR is the dependent variable CSP, β0 is the regression constant that is equal to the y intercept of the regression line, ROE is CFP measure, size is the logarithm of total assets used as a proxy for firm size, metalworking is metalworking machinery and equipment industry, chemicals is chemicals, petroleum, rubber, and plastics industry, cement is cement/glass products, mining, other manufacturing, and electric/gas/water supply industry, food is food, beverage, tobacco industry and β1, β2, β3, β4, β5, and β6 are the regression coefficients for the independent variables ROE, firm size, metalworking, chemicals, cement and food respectively.

The correlation matrix for all the variables used in this model and collinearity statistics (i.e. tolerance and variance inflation factor values) indicate that a problem of multicollinearity is not detected. Table 5 contains the results of the regression analysis using CSR as the dependent variable and ROE, firm size, and industry type as the independent variables.

The R^2 indicates that .221 of the dependent variable's variation is related to CFP, firm size, and industry type. This is an improvement in the fit compared to previous two models. The overall F-test for the model is 2.368 with a p value of .043. The equation as a whole is statistically significant (.043<.05). Turning to consider whether the independent variables are uniquely associated with the dependent variable, we discover that firm size is the sole variable that is statistically significant. The negative regression coefficient for the logarithm of

assets suggests that firm size and CSR change in opposite directions. We conclude that CFP is not positively related to CSP. Therefore, we fail to provide support for Hypothesis 2.

Table 5. Regression results from using CSR as the dependent variable and ROE

as the key independent variable when controlling for firm size and industry type

Variable	Coefficient	Std. Error	t Stat	P Value
(Constant)	2.417	.448	5.402	.000
ROE	.073	.202	.361	.720
Log of Assets	-.062	.021	-2.960	.005
Metalworking	.069	.164	.421	.676
Chemicals	-.025	.176	-.141	.888
Cement	.093	.185	.502	.618
Food	.290	.197	1.474	.147
R^2				.221
F				2.368
Sig. F				.043a

a. Predictors: (Constant), Food, Logarithm of Assets, Cement, ROE, Chemicals, Metalworking

Conclusion

In this study, we sought to explore an association between the level of CSR disclosures on corporate websites and CFP. Additionally, our findings inform us of the types of CSR issues and the stakeholder groups that companies most commonly make reference to on their websites.

We found that the websites of all enterprises included in the sample contain some information that is related to CSR. However, three issues - product quality, environment, and workplace health and safety - particularly stand out as essential to the content of the websites of the largest industrial enterprises. 97% of the websites contain information about the issue of product quality. This result is not surprising. Problematic products may damage brand image and may have significant adverse effects on CFP. Therefore, CSR messages are developed to stress the importance attached to quality. Similarly, 97% of the websites reveal a concern for environmental issues. These CSR messages include issues of waste management, improvement of business efficiency, energy savings, etc. Lastly, 86% of the websites provide CSR messages that concentrate on the importance of workplace health and safety. The emphasis on this issue may stem from legal obligations or there may be other considerations at stake such as attracting and retaining a loyal workforce. Nevertheless, the more likely explanation for organizational focus on messages of this kind is the desire to avoid consumer boycotts or critical media attention in the context of Turkey where workplace accidents due to the negligence of employers are commonplace.

For most of the firms, certain stakeholder groups, i.e. customers, shareholders and employees, also take precedence over others. CSR messages developed for customers typically contain an explicit focus on

satisfying their needs and expectations. Shareholders represent another important stakeholder group that firms are willing to communicate their socially responsible behaviours. CSR messages directed to shareholders have been divided into two categories. The first presents an explicit statement that organizations intend to deal with their owners honestly and with integrity in all their communications; the second describes their level of commitment in building shareholder value through the generation and marketing of high-quality goods and services (Snider, Hill, & Martin, 2003). Our data provide empirical evidence of this categorization, that firms concentrate their discussions on these two categories. Lastly, employees constitute another stakeholder group that are frequently addressed on corporate websites. They receive messages concerning continuous development opportunities, performance management, work-life balance, etc.

To summarize the results of this research, the level of CSP is not associated with the level of CFP, and vice versa. The absence of a positive relationship between CSP and CFP does not support an instrumental stakeholder approach; however, it supports the argument that CSP-CFP relationship might be stronger for firms operating in developed economies, rather than developing economies, where mature institutional systems alongside efficient market systems exist (Wang, Dou, & Jia, 2016). Moreover, our results suggest that a greater CSR focus is not associated with poorer financial performance, at the very least. Such a result could motivate organizations to pursue CSR for goals other than financial ones. For instance, previous studies have revealed that prospective employees with multiple job choices favour firms demonstrating higher levels of CSR (Albinger & Freeman, 2000; Turban & Greening, 1996).

Further, we discovered that firm size and CSP are negatively associated - as the firm size increases, the level of CSR disclosures tends to decrease. One possible explanation for the negative relationship between firm size and CSP is that larger organizations seem to use their economies of scale and slack resources to generate higher financial performance, but this heightened concern for financial goals may come at the expense of social goals (Judge, 1994). This may well be the case when an economy suffers contraction just like in the years the data for this study were collected.

Our findings should be approached with caution as the present research has had certain limitations. First, there might be a weak relationship between a company's CSR disclosures and its actual CSP. It is important to emphasize once again that we used CSR-related information disclosures on corporate websites as a proxy for CSP. Past research suggested that companies are more likely to attract critical stakeholder attention, if they focus too intently on communicating social ambitions (Ashforth & Gibbs, 1990). Therefore, they might have filtered out some information about their CSR actions. From the other side, companies might have over-emphasized the level of socially responsible activities they engage in to attain economic or other types of benefits. Thus, a one-to-one correspondence between CSR disclosures and actual CSP may not exist. Second, we examined a cross-sectional relationship between CSP and CFP. Future studies should use longitudinal designs (such as cross-lagged designs) to find out potential financial advantages or disadvantages that could arise in the long run. Finally, ROE is the only financial variable used in this study. Future studies should employ other measures such as return on assets (ROA) or earnings per share (EPS) to see whether employing one or the other type of variable produces different results.

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7

An Unconventional Example of Corporate Social Responsibility: The TEPAV Real Sector Confidence Index

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Abstract

This study examines a distinctive topic in corporate social responsibility literature as it focuses on the effects and contributions of a leading economic indicator which is calculated and made public by a private corporation in the emerging market of Turkey. The Economic Policy Research Foundation of Turkey (TEPAV) collects information from producers in several different sectors of the Turkish economy through a survey that includes eight questions and announces an index value titled Retail Sector Confidence Index (RSCI) through averaging Questions 1, 2 and 4. The results are announced monthly and this paper checks the information content of this index for both current and future economic stance. RSCI should help economic agents to update their information sets and decide on their expectations of current and future consumption patterns and the general economic outlook. Hence, RSCI of TEPAV is expected to fill an important gap as a proxy and we compare it with similar survey data to check its validity. The data set is for May 2008 – October 2016 except Economic Confidence Index (ECI), for which it is January 2012 – October 2016. The methods employed are frequency-domain causality and wavelet comovement analysis. Our results show that RSCI causes especially food consumption stands out as the most significant determining factor of economic agents' perceptions of the social responsibility projects of corporations.

Keywords: Corporate social responsibility, Producers expectations, Consumption behaviour, Frequency-Domain causality, Wavelet comovement

Introduction

Corporate social responsibility (CSR) has been at the core of the literature in recent years due to its focus on various crucial factors that affect not only businesses but also households, economies and the world. CSR tries to be the major substitute for economic externalities that occur as deadweight losses in production. Hence, these negative externalities would be offset by the positive effects of CSR projects and thus, both companies and economic agents should be better off. This paper aims to enhance a different branch of the CSR literature by focusing on the importance of information created by some corporations that is valuable to the whole society especially in terms of future decision making through the continuous expectation formation processes of economic agents. In this respect, this study is composed in the following manner. We have a literature review part that follows. The second part focuses on the relationship between CSR and information (data) dissemination. The third part includes the econometric methodology, limitations of the study, describes the sample and data, mentions the validity of the research and presents the finding and evaluations. Conclusion follows the third part with some policy implications.

Literature Review

Corporate Social Responsibility (CSR) has surrounded us from different aspects and has been connected to empowering us to understand better some of the major challenges which have ever faced man during his existence in planet Earth declares the editors of *People, Planet and Earth*. For example CSR has enabled us to respond to climate change, address the costs of globalization, increase the effectiveness of internal corporate governance, uphold international human rights, increase justice and equity, especially in the poorest parts of the world, fight corruption and poor governance and achieve stable and sustainable economic growth says Blowfield and Murray (2011). Such aspect of CSR resembles the pension fund system, which have social and economic objectives to foster sustainable economic growth and increase in individual wealth (Avcı, 2010). Despite Nobel Prize laureate Milton Friedman's famous quote "The social responsibility of business is to increase its profits" , the global Corporate Social Responsibility (CSR) consultancy Cone Inc.(2015)latest surveys state that **91%** of global consumers expect companies to do more than make a profit, but also operate responsibly to address social and environmental issues, **84%** say they seek out responsible products whenever possible, **90%** would boycott a company if they learned of irresponsible or deceptive business practices. As a matter of fact, according to Carroll & Shabana (2010)'s research, only 6% of consumers agreed with the economist Milton Freedman that a company's only responsibility is to its shareholders by purely focusing on profit maximization. Corporate social responsibility (CSR) can be defined as the "economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time" (Carroll and Buchholtz 2003, p. 36).

There are various ways of defining extent of a company's social responsibilities. The two most common arguments are; business exists to serve the good of the greater community as Weber (2009) states and the social responsibility of business is to increase its profits as Friedman indicates. The World Business Council for Sustainable Development defines CSR as "meeting the needs of the present without compromising the

ability of future generations to meet their own needs." Carroll divided the concept of corporate social responsibility into four different categories as economic, legal, ethical, and discretionary, describing as the levels of a pyramid.

The central idea of the concept arises from the argument that a company must have other objectives besides making a profit. CSR is founded on incorporating responsible business practices into a company's core business activities, and thus creating value for investors, stakeholders and the community as a whole. Companies employ corporate social responsibility in their business lines for different reasons. Mainly three facts can be mentioned: Firstly, CSR is based on the stakeholder model, where focus is placed on a company's relationships with the groups that have a relation with the entire business environment such as customers, employees, shareholders, suppliers, the environment and the local community as stated in Halvarsson's report. Today, achieving profitability requires that companies meet the demands of their stakeholders. Engaging in corporate social responsibility can also be motivated to create an improvement in human relations and employee productivity. Working for a "responsible" company can exhibit positive externalities in the form of increased productivity, as employees might be better motivated to do their job. Many financial institutions reflect the same approach like supporting education, citizens with disabilities, volunteer works, health agencies etc.

Secondly, firms voluntarily engage in CSR activities in order to prevent future governmental regulations: Maxwell et al. (2000) discuss how an increase of government regulation induces firms to voluntary reduce emissions before the new laws are actually passed. In their model, they display that without voluntary control, the new regulation laws will potentially be stricter. Consequently, firms have an incentive to self-regulate. Thirdly we can discuss the matter of 'vertical product differentiation': In marketing, product differentiation refers to the alteration of a product to make it more attractive to the target market. Vertical product differentiation is most often associated with producing similar goods with different qualities. Bjorner et al. (2004) find that a considerable group of consumers are eager to pay a little extra for a product if it is produced in an environmental friendly way.

Another reason can be declared as liability management according to Dam. In this context, corporate social responsibility can be seen as a way to avoid environmental scandals, consumer boycotts, or law suits which show clearly that CSR information would affect directly consumer behavior. In 1995, a media campaign by Greenpeace against the disposal of the oil storage tanker Brent Spar, caused a huge environmental scandal. Since then, Shell has been one of the pioneering companies to engage in corporate social responsibility, adopting the popular slogan "People, Planet and Profit". Related to such scandals are consumer boycotts. Friedman (1999) reports that consumers start boycotts more and more frequently. One of the reasons for consumer boycotts is dissatisfaction with corporate policy after receiving information on how goods are produced. Finally, law suits such as those against the tobacco industry have shown that scandals do not only hurt brand equity, but can induce large costs in the form of penalties.

Hosei and Ulku (2014) examined the surveys of Cone Inc. and Echo research which piloted an extensive study involving 10,000 consumers in the world's ten largest countries by GDP (e.g. USA, UK, Germany, China, India, Brazil and China) to reveal consumer attitudes toward socially responsible firms and their CSR expectations (Cone Inc., 2011). According to their findings, if a company addresses issues that consumers find most important, it may be rewarded with their trust, loyalty, advocacy, engagement and increased sales. Specially, they initiated that "when price and quality are equal, 94% of consumers are likely to switch brands to one associated with a good cause" (Cone Inc. 2011, p. 21). Actually, 76% of these consumers noted that they have swapped brands in the past 12 months (Cone Inc. 2011). Likewise in 2011, 93% of consumers indicated that they would buy a product/service linked with a cause compared to 56% of consumers in 2008, which signals a major rise in this consumer attitude. But maybe most significantly, the study also found that 93% of consumers are prepared to boycott a company for irresponsibility or deceptive business practices, of which 56% already boycotted companies in the past (Cone Inc. 2011). Cone Inc's latest survey (2015) which includes 10.000 respondents indicate that 91% of global consumers expect companies to do more than make a profit, but also operate responsibly to address social and environmental issues, 84% say they seek out responsible products whenever possible, but %52 don't believe that companies are acting responsibly until they hear communications otherwise, the global consumers believe that if the companies address social and environmental issues they will be rewarded with 88% loyalty, %90 trust and %93 positive image. 90% would boycott a company if they learned of irresponsible or deceptive business practice, more than nine-in-10 Millennials would switch brands to one associated with a cause (91% vs. 85% U.S. average). Two-thirds use social media to engage around CSR (66% vs. 53% U.S. average). The positive or negative information affects directly their potential decisions for a product. 62% are willing to take a pay cut to work for a responsible company (vs. 56% U.S. average).

Corporate Social Responsibility and Data Dissemination

There are three possible means that could be used to explain the link between CSR and the private economic data dissemination.

One of them is the laws which bind private corporations (that have shares traded in the stock exchange market) to provide data, news or information that is valuable for the public through the news channels created in each economy. For examples in Turkey, The Public Enlightenment Platform is the outlet through which the corporations (companies, firms, etc.) that are traded in BIST index disseminate all the information, data or news regarding the past, current and future plans, actions and strategies (i.e. change in any of the variables that are important for the shareholders and any economic agent related to the corporation, company, firm, etc.). This is a common practice and can be important if the news providers build strategies that are compatible with CSR. Indeed, it is possible that a company which values CSR as an important part of its' business strategy (which actually should be valid for all the companies) can draw more attention from the public and possible investors. Hence, such actions may increase the optimism of stock investors leading to higher demand for the stock of the company and increasing the price of the stock after a certain point if the company is able to meet all its goals in terms of business strategy that is enhanced by its' CSR actions.

Therefore, profits are not obtained just by doing business in the best possible way that the company can but also by providing a public friendly and sincere relationship with all the parties that are important players for the company.

The second link relates to the competitive nature of the markets. As the rivals of a company in an industry use information channels to disseminate data publicly to economic agents on their successful CSR actions, the company has to follow similar CSR policies so that it does not fall behind in terms of credibility, reputation and quality. Hence, second approach argues that CSR is a must concept for companies not because of legal obligations but due to the need to be an active market participant. The global market has led to monopolistic competition in many sectors and companies have to meet the challenges in their markets as well as looking for ways to distinguish themselves from their competitors. In the past, there were concepts like quality, branding, research and development, total quality management, customer relations management and risk management. The recent trend has shifted towards approaches like use of information technology through innovations (that help the customer to ask for any product from the company assembly), use of advanced methods of production and CSR which could provide advantages for companies depending on how creative they could be. In this sense, CSR is a major tool for companies to prove that they are on the right track in terms of being a competitor in the market and also off the market issues that are very crucial in general for the whole society.

Finally, the third link is purely CSR oriented as some corporations calculate and provide data for the use of public with no intentions of increasing profits or gaining comparative advantage vis-à-vis competitor companies or other parties similar to them in terms of foundational stance. Some of these companies are think tanks and compile data through surveys aiming to help the economic agents while forming their expectations of important economic, real and financial variables. Most of the data released is in the category of surveys called the leading economic indicators, trying to measure through survey questions and then offer a picture of the current status of the economy. As agents and firms always face difficulties in having a clear picture of the aggregate economy, there are several surveys that gather data from different parts of the economic pendulum such as the consumers, investors and producers. Overall, these surveys probably constitute the most important contribution to CSR paradigm as there are no profits involved and the information these indicators provide is quite accurate and reasonable to understand compared to the sophisticated nature of conventional CSR actions.

Methodology

Stock and Watson (1989 and 2010) argue that leading indicators in the sense of indices are important sources that can be used for forecasting of the macroeconomic variables. Therefore, some corporations announce economic and financial indicators that presumably contain some information obtained from the survey participants free of charge to the general public use. In especially dynamic emerging markets, such data should be very crucial for the continuous update processes of consumer and producers' information sets.

This paper aims to check the existence, importance and statistical significance of such a leading indicator-TEPAV's Retail Sector Confidence Index (RSCITEP)-and its link with some other survey data, namely the Real Sector Confidence Index of the Central Bank of the Republic of Turkey (RSCICB), the Consumer Confidence indices of Central Bank of the Republic of Turkey-Turkish Statistical Institute (CCICB) and Bloomberg-HT TV (CCIBHT), the Capacity Utilization Index of Central Bank of the Republic of Turkey (CUTS) and the Economic Confidence Index of the Turkish Statistical Institute (ECI).

The econometric methods employed are by Breitung and Candelon (2006) who propose a frequency-domain causality test to determine whether the variables cause each other in all/some/any possible frequencies and the wavelet comovement analysis, derived by Rua (2010), which is a giant step further than the conventional cointegration analysis.

These recently developed techniques are derived to examine the relationships between variables in a non-linear world spectrum. Thus, they are econometric tools that are well equipped while helping us to assess the dynamics of the relationships between variables of interest better than conventional and rather ineffective measures.

Limitations of the Study

There are two main limitations of this study which are not really expected to be very effective on the empirical outcomes.

The first of these is the span of data not being very as it runs from May 2008 till October 2016 (January 2012 – October 2016 for ECI). The data is monthly and there are more than 100 (50 for ECI) observations. This is a number which seems to be within the limits of plausible statistical and econometric analysis. On the other hand, the second limitation is the unavailability of statistical significance check (test) for the wavelet comovement test of Rua (2010), which is inherent in the structure of the econometric methodology. However, Rua (2010) advises to use a range of > .8 and < - .8 for the check of statistical significance of the correlation coefficients (obtained in the diagrams) as a benchmark. This approach helps to determine whether there is significant comovement as well as the length of the time period for the relationship through the frequency bands and the wavelet oscillations formed. The null hypothesis of no correlation is rejected when the calculated values are bigger (smaller) on the positive (negative) side of the spectrum.

Sample and Data

Some private corporations try to gather qualitative data from specific industries in an economy through surveys that are carried out by asking questions to managers that are in positions to decide for their company's future strategies. One of these surveys is the Retail Sector Confidence Index compiled by TEPAV (The Economic Policy Research Foundation of Turkey), a private think tank and an affiliate of a private Turkish University in Ankara. TEPAV collects information from producers in several different sectors of the Turkish economy and announces an index that is free of charge for the public use. This index is unconventional in the

sense that it differs from the others by asking directly producers what they perceive as the current status of their respective sectors by considering not only their corporations but also the general market conditions. Hence, the results that are announced monthly should help consumers, experts, public sector institutions and all other economic agents to learn about the current information set of the producers in major industries in Turkey. This will lead to the continuous update of the information set of all economic agents in the economy so that they can use this freely available information while forming their expectations on different economic and financial variables for the future which they think should be relevant in their economic models. The index is obtained by aggregating the responses of managers for companies in the most important sectors of the Turkish economy. The sectors included are 'food and non-alcoholic beverages', 'alcoholic beverages and tobacco', 'clothing and footwear', 'furnishing, household equipment, routine maintenance of the house', 'transportation' and 'miscellaneous goods and services'. Given the rationality of expectations, we believe that producers' survey results have valuable information about the future consumption patterns of households. Hence, the Retail Sector Confidence Survey of TEPAV is taken as a proxy for consumption and we compare the general index value with other survey data to see whether TEPAV is able to contribute to our existing knowledge as TEPE is a leading indicator announced earlier than most surveys. The data set runs through May 2008 – October 2016 except RSCITEP and ECI couple which is for January 2012 – October 2016. The TEPAV survey contains eight monthly survey questions and the RSCI is calculated as the average of Questions 1, 2 and 4. The questions are as follows:

1. In what direction has been the status of your business within the past 3 months? (increased, the same, decreased)

2. What do you think about your existing stock level? (above the average, normal, below the average)

3. In what direction do you think that your orders from the suppliers will change for the next 3 months? (will increase, will be the same, will decrease)

4. In which direction do you think that your sales are going to be for the next 3 months? (will increase, will be the same, will decrease)

5. In which direction will the number of your employees change for the next 3 months? (will increase, will remain the same, will decrease)

6. What do you think about the direction of your selling price is going to be within the next 3 months? (will increase, no idea, will decrease)

7. How do you evaluate the performance of your business this year compared to last year? (increased, stay the same, decreased)

8. How do you expect the number of your outlets to change next year? (increases, no idea, decreases)

The first and seventh questions check the past, second the current and the other five try to measure the producers' expectations for the future. Our data set includes seasonally adjusted values of RSCITEP, RSCICB and CUTS and the levels of CCICB, CCIBHT and ECI so that a better general picture will be obtained and remaining noise is cleared. All the variables are in logarithms.

Validity of the Research

The validity of the research is already built in the econometric methodologies that are used to test the effectiveness of the CSR actions as providing data for general public use. In a non-linear world, using linear techniques would result in flawed outcomes and it has been a long time now that most of the variables of interest in economics, finance, business world and presumably most other social sciences have been categorized as non-linear in nature. Hence, to prevent the undesired outcomes that would only provide confusing results with no clear-cut answers to the questions that have been academically studied over several decades, this study prefers to choose the path that should lead to some answers that would be crucial and robust for future studies.

Findings and Evaluations

This part includes the interpretations of the Figures for Frequency Domain Causality analysis and the Wavelet Comovement analysis between RSCITEP and RSCICB, CCICB, CCIBHT, CUTS and ECI, respectively. The picture of the data, the correlation matrix for the variables and the figures for frequency domain causality and wavelet comovement are in the Appendix.

The frequency domain results are titled as a) to e) in the Appendix and they show that RSCITEP causes RSCICB, CCICB and CUTS in the long-run, RSCICB and CCIBHT and CUTS in the medium term and ECI in the short-run. CCICB causes RSCITEP in all frequencies but only at 10 % level, CCIBHT causes RSCITEP in the long-run and short-run and ECI causes RSCITEP in the medium term only at 10 % level. Hence, the only 5 % level bi-directional causality is between RSCICB and CCIBHT, two private corporations that both disseminate data for the general public use, one focusing on the expectations of producers and the other one focusing on the perceptions of consumers. There other significant bi-directional causality between RSCITEP and other variables but these results are not as strong as the one for two private indices that are released only for the good of public use with no legal status or aiming at profits. Thus, the empirical findings of this part lend strong support for CSR actions of private corporations, especially if they are concentrated on pure non-profit activities like providing information to the economic agents in a continuous manner.

On the other hand, the wavelet comovement results follow the frequency domain results and are also titled as a) to e) for the purposes of simple comparison. RSCITEP and RSCICB display significant positive comovement in the short-run between mid-2008 and mid-2010 and in 2016 whereas there is significant positive comovement in the long-run during the last quarter of 2009 and the second quarter of 2011. Hence, the two producer surveys have significant comovement during different frequencies but the observed

correlation coefficient sign is always the same (positive). In terms of RSCITEP and CCICB, we observe significant positive comovement in the short-run between May 2008 and December 2010 and October 2014 and October 2016. However, there is also negative and significant comovement between these two surveys in 2012 from six months to one-year period. We also observe very short-run (1–2 months) negative significant comovement in mid-2014. There are certain periods where the expectations of producers contradict the perceptions of survey participants in especially the short-run. These are rather corrected in the long-run but the significance of the relationship is lost due probably to too much focus on the short run, wiping away any long-run similar paths of expectations.

When we consider the RSCITEP-CCIBHT pair, there is positive and significant comovement both in the short-run, (May 2008-February 2009, last quarter of 2011 and 2013 and last quarter of 2015 and 2016) medium term (between May 2008 and December 2011) and long-run (between May 2008 and June 2012) at different dates. However, there is also significant negative comovement in the very short run (mid-2013) and around 9–12 months (in 2012). As in the case of frequency domain analysis, the RSCITEP and CCIBHT are the pair which produces the highest amount of significance for comovement. Nonetheless, there is some distinct pattern which shows that the discrepancy between producers and consumers change from the very short run at the beginning of the period to the long run at the end of the period. On the other hand, a positive comovement in the short-run is established by 2016 which probably signals that both producers and consumers are using similar models as they try to detect the signs from the economy on the current stance. The fourth couple is RSCITEP and CUTS where the graph d) displays more negative and significant comovement than any other case. The only instance of positive and significant comovement is during the very short run of the first quarter of 2011, a year in which the Turkish has grown at a level much higher than the average of the following five years. The negative significant comovement is observed at short-run and several times throughout the period. This signals that producers are not happy with the levels of capacity utilization and/or producers have increased the levels of inventory, overproducing during the boom years. This leads to decreasing profits and producers cutting production but the outcome again might not be as the producers expected. Hence, the capacity utilization is an important measure that contradicts the producers' expectations. Finally, Figure e) of the wavelet comovement analysis shows the relationship between RSCITEP and ECI. There is significant and positive comovement in 2016 around the frequency of 6 months. On the other hand, the figure displays negative and significant comovement for the 3 month period during the first five months of 2013, the last 6 months of 2014 and the 10 months of 2016. Therefore, RSCITEP and ECI are mainly negatively related. This means that short-run dominates the relationship as economic agents lose confidence in the general economic conditions very fast and it is hard for them to feel optimistic when they believe that producers are not following strategies that are socially desirable but rather profit oriented.

Overall, there is significance in some of the frequency domain analysis whereas the numbers of significant outcomes increase in the wavelet comovement analysis.

Conclusion

This study tries to measure the effectiveness of data dissemination in the CSR literature through a comparison of the TEPAV RSCI with similar data from Official Statistical Institutions like TS and CB and BHT, a private TV channel. We conclude that it is important to use private sector data that is well prepared, which is definitely the case with TEPAV's RSCI. It causes the other survey data more than the other survey data causes RSCITEP. The only variable that has the deepest relationship in terms of the theoretical and empirical considerations stands out as the CCIBHT. The other variables that we employ have significant and positive linkage to RSCITEP only at very limited maturities and rather with smaller correlation coefficients or mainly insignificant values as the regression equations used are incapable of providing any real effect due their unhealthy fundamentals which fall short of measuring or observing human behavior.

Nomenclature

CCICB: The consumer confidence index of Central Bank of the Republic of Turkey & Turkish statistical institute

CCICBHT: The consumer confidence index of Bloomberg-Habertürk TV channel

CUTS: The capacity utilization index of Central Bank of the Republic of Turkey

ECI: The economic confidence index of Turkish statistical institute

RSCICB: Real sector confidence index of the Central Bank of the Republic of Turkey

RSCITEP: Retail sector confidence index of TEPAV

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Appendix

The Variables
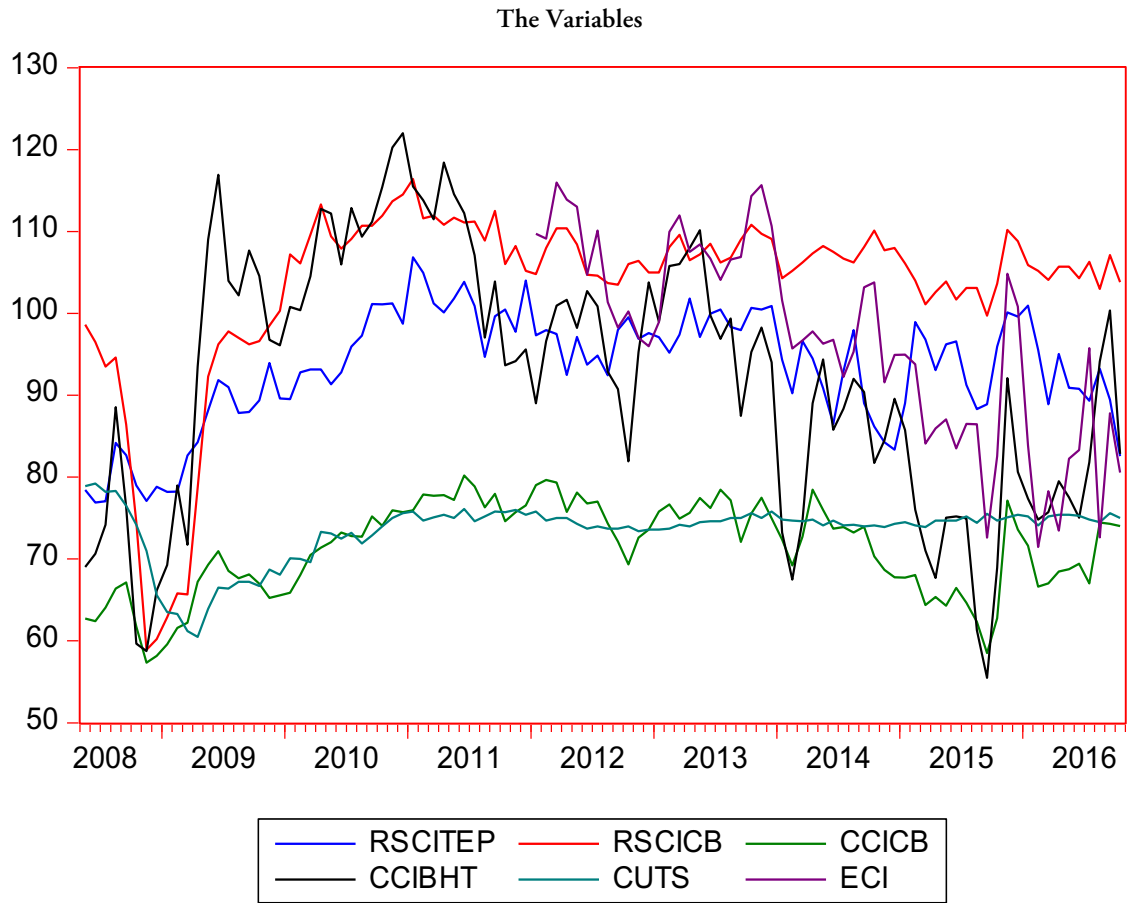
Table 1. The Correlation Matrix

Correlation Coefficient	RSCITEP	RSCICB	CCICB	CCIBHT	CUTS	ECI
RSCITEP	1.000	0.189	0.392	0.338	0.024	0.414
RSCICB		1.000	0.621	0.593	0.107	0.702
CCICB			1.000	0.839	-0.055	0.734
CCIBHT				1.000	-0.269	0.695
CUTS					1.000	-0.107
ECI						1.000

Frequency Domain Causality Figures

c) RSCITEP and CCIBHT

d) RSCITEP and CUTS

e) RSCITEP and ECI
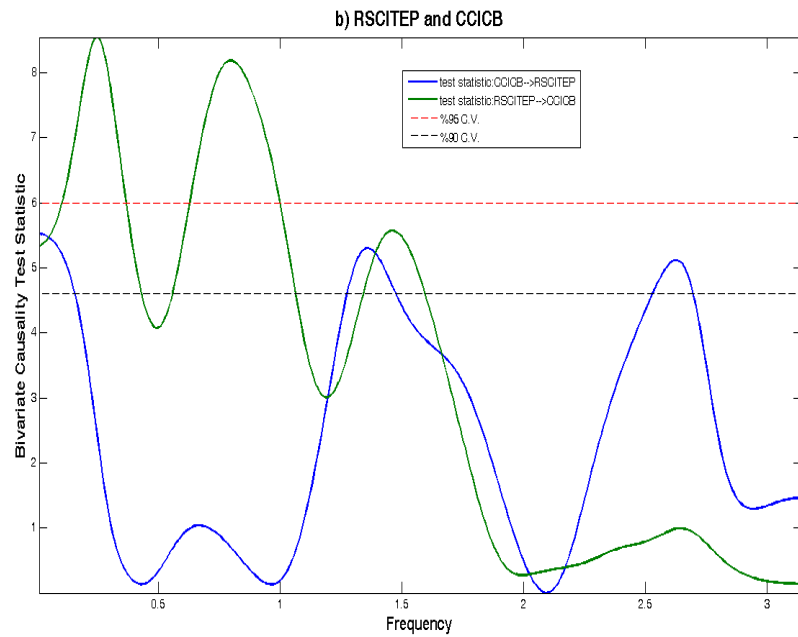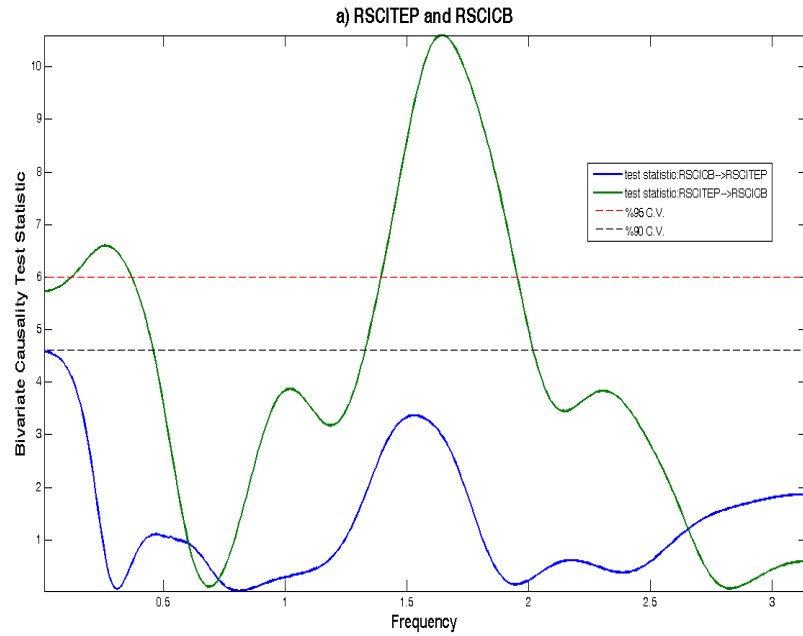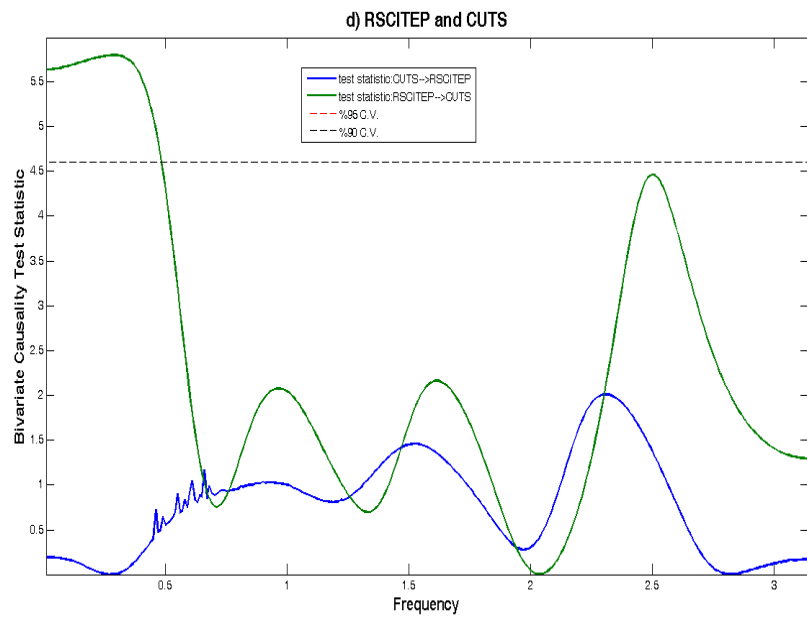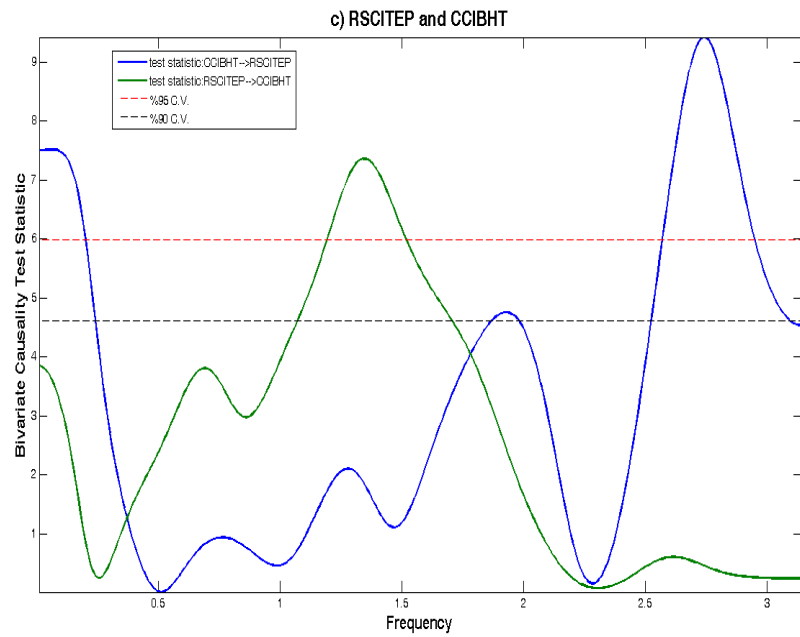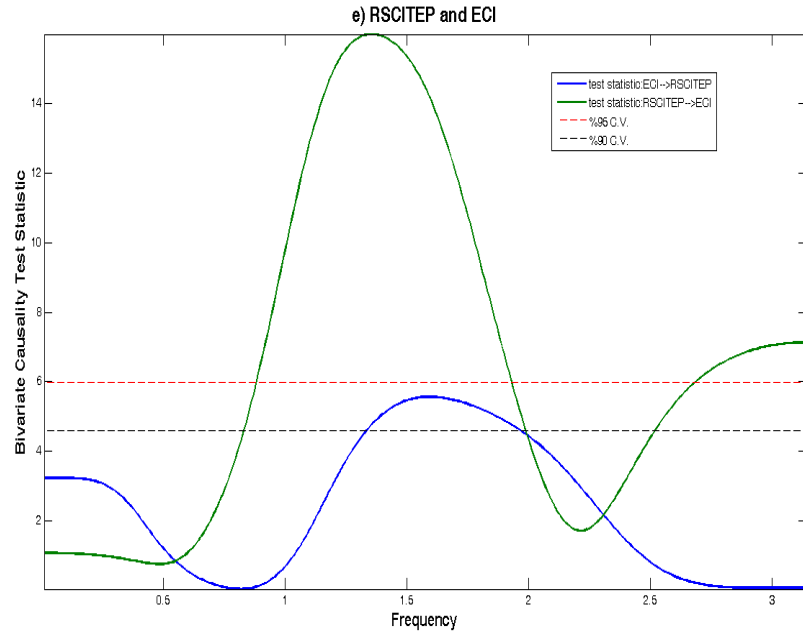
Wavelet Comovement Figures

a) RSCITEP and RSCICB

b) RSCITEP and CCICB

c) RSCITEP and CCIBHT

d) RSCITEP and CUTS

e) RSCITEP and ECI
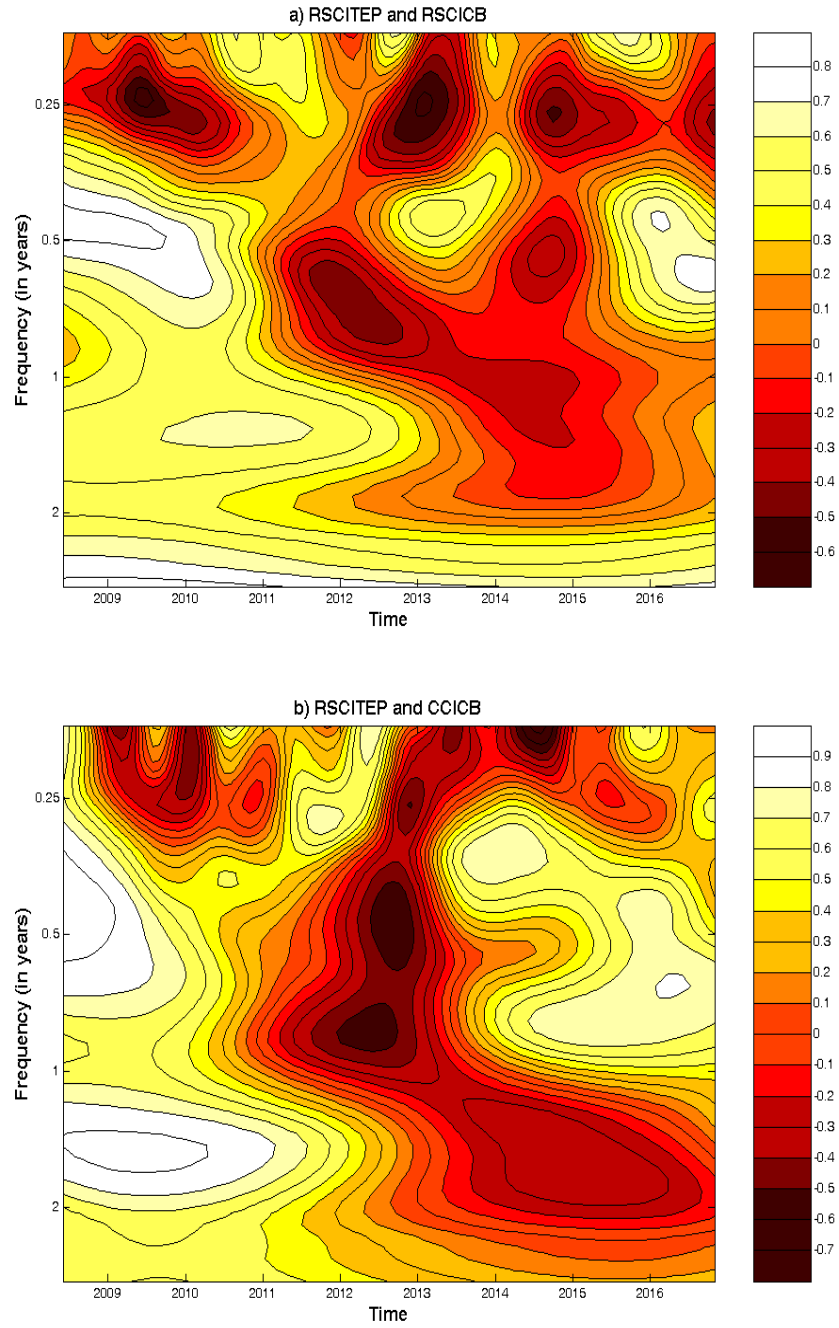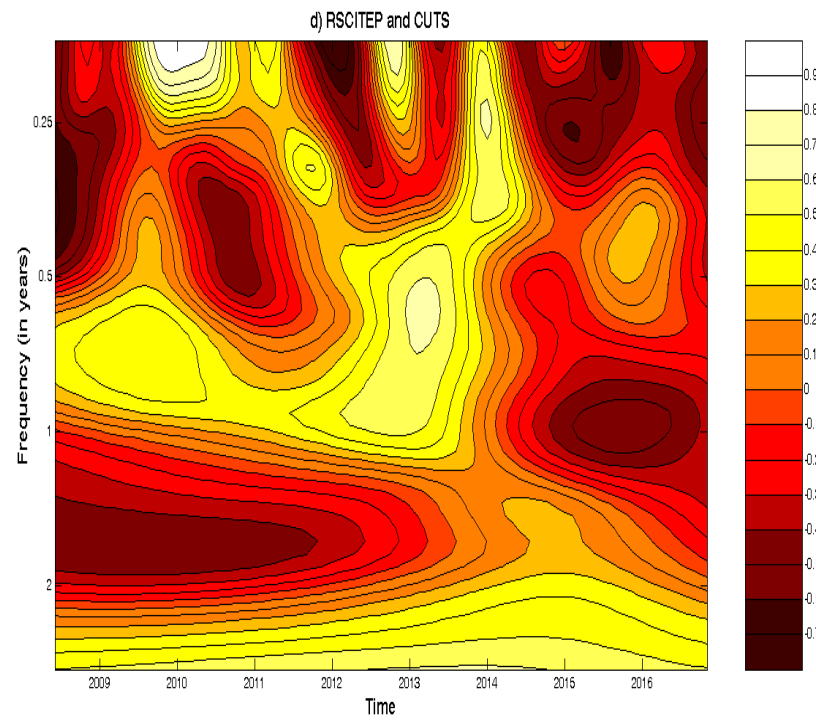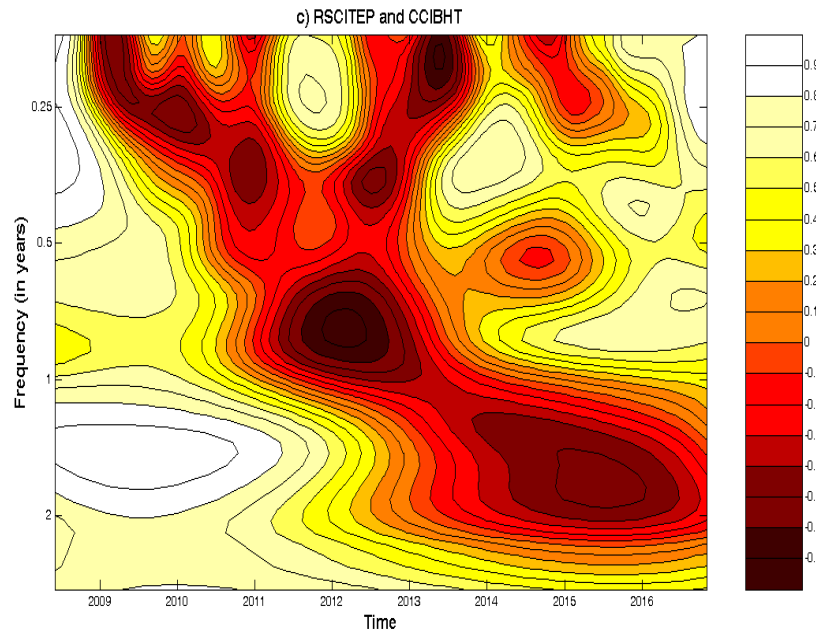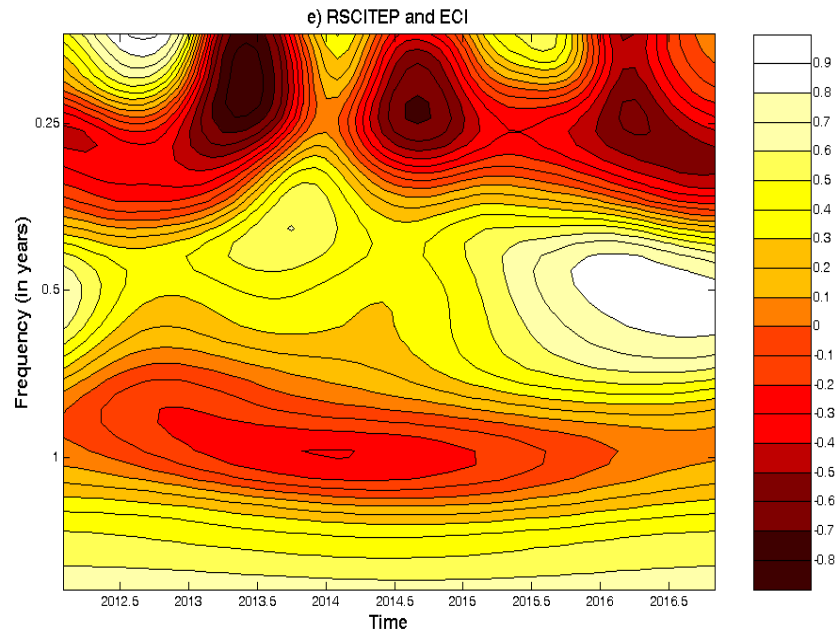
8

Effect of Human Resources Practices on Sustainable Performance: A Survey of Technopark Companies

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Serdar Bozkurt
Burcu Yiğit
Mehmet Çağlar

Abstract

Human resources practices should involve a wide range of activities from employee selection process to training and development, career and performance management. Efficient and successful management of those practices could ensure an increase in organizational performance. In this regard, the aim of this study is to investigate the impact of human resources practices on organizational and market performance. As a result of this study, it was found that HRM practices have an effect on perceived organizational performance and also market performance.

Keywords: HRM Practices, Organizational Performance, Market Performance, Sustainability

1. Introduction

In a rapidly changing business environment, human resources practices are one of the most important sources of competitive advantage. Human resources practices allow to contribute to the success of the organizations and also to increase the organizational performance. In this study, performance includes the perceptions of managers towards the market and organizational performance of their firms. Employees are

the primary determinant of performance and also the competitive advantage. Within the competitive business world, sustainability is another important issue for organizations that contribute to the competitive advantage, financial facility, increasing corporate reputation and also innovation activities.

The main research question of this study is to determine whether Technopark firms' human resources practices have an impact on sustainable performance. Moreover, in this study it is attempted to explain the relationships between HRM practices, performance and sustainability. In this context, the fact that there is no similar work on Technopark firms in our country increases the importance of the study. It has been attempted to put forward which human resources practices affect organizational performance and market performance by this study towards 57 Technopark companies.

1.1 Literature Review

In the literature, researchers have deeply discussed the link between human resource m anagement and organizational performance (Collings, Demirbag, Mellahi, &Tatoglu, 2010; Chow, Teo, & Chew, 2013; Absar, Nimalathasan, & Jilani, 2010; Camps & Arocos, 2009). Human resources practices will be defined in the first part and organizational performance in the second part of the study. The present study explores the impact of human resources practices on organizational and market performance.

Organizations have to focus on human systems. The principal aim of human resources practices is to provide the continuity of employees in the organization. Wright and McMahan (1992) defined strategic human resource practice as "the pattern of planned human resource deployments and activities intended to provide the firm to reach its goals" (Ojo, 2011). Training, performance appraisal, career planning, involving in decision making, job definition, worker selection process and wage are seven dimensions of human resources practices. Human resources practices help the organizations to compete in a global marketplace. Human resources have a significant role in activities and practices that design, develop, organize, support and execute employees' work (Akdere, 2009). Human resources practices encourage firm performance through retaining, motivating, empowering, and developing employees (Florea, Cheung, & Herndon, 2013). Human resources practices include; human resource planning, job analysis, recruitment, selection, orientation, compensation, performance appraisal, training and development and labor relations (Absar, Nimalathasan, & Jilani, 2010). Macy and Izumi (1993) composed Quality-focused Human Resource Practices (QHRP) model and they proposed that there is a relationship between them in their model (Akdere, 2009). Quality also has an important place in human resources practices. Successful human resources practices contribute to productivity, quality and also financial performance (Nemli-Çalışkan, 2010). Thanks to investing to human and effective human resource practices will decrease the turnover rate and contribute to the organizational success. Also, it will make the contribution to the performance indirectly (Gürbüz & Bekmezci, 2012). According to the literature, human resources practices support the organizational performance.

Organizations have to use their scare resources effectively and efficiently to obtain performance. Organizational performance is generally related to effectiveness, efficiency, employee satisfaction, customers,

innovation, and quality of products or services (Absar, Nimalathasan, & Jilani, 2010). Dyer and Reeves (1994) determined four types of measurements for organizational performance; (1) human resource outcomes such as turnover, absenteeism, job satisfaction, (2) organizational outcomes (productivity, quality, and service), (3) financial accounting outcomes, and (4) capital market outcomes (Ojo, 2011).

2. The relationship between HRM practices, Performance, and Sustainability

Because the consumption of people is excessive, scarce resources trouble and environmental depletion will be inevitable. Organizations should think the future generations and also use resources efficiently to not damage others. Sustainability is seen as a fundamental goal for organizations (Florea, Cheung, & Herndon, 2013). With the sustainability, organizations can maintain competitive advantage, financial facility, increasing corporate reputation and also innovation activities. Sustainability express longevity and continuity in the organization (Florea, Cheung, & Herndon, 2013).

Human resources and performance provide the sustainable competitive advantage for organizations (Collings, et. al., 2010). Human resources have a significant relationship with the performance of the organization (Nemli-Çalışkan, 2010). Human resources practices are associated with the organizational performance (Rizov & Croucher, 2009). Human resources practices have the significant relationship with employee turnover and organizational commitment (Absar, Nimalathasan, & Jilani, 2010). In the literature, there is generally strongly positive relationship with the organizational performance outcomes (Akdere, 2009). Human resources practices increase perceived performance (Rodwell & Teo, 2008). There is an indirect effect between investment human resources management systems and firm performance (Chow, Teo & Chew, 2013). There is a positive relationship between strategic human resources applications and organizational performance (Ojo, 2011; Gürbüz & Mert, 2011).

3. Methodology

3. 1. Purpose and Importance of the Research

The main purpose of this research is to examine the effect of human resources practices in maintaining operations of the companies in Technoparks on their organizational performance and market performance. Yıldız Technopark has been chosen since it is one of the pioneering Technoparks in our country, it has high level of institutionalization and it has been observed that its current applications are maintained in a stable manner. This study comes into prominence since there are not many similar studies toward Technoparks in our country. Moreover, this study has an interdisciplinary character since it indicates the relationship between human resources practices and sustainability in the strategic framework.

3. 2. The Sample of the Research

The population of the study consists of Technopark companies which are located at Yıldız Technical University and operate in different sectors (n=361; http://www.yildizteknopark.com.tr/tr/icerik-0/firmalar-

27.html). A questionnaire form was sent three times to these firms. Since participation was low, the questionnaire form was delivered by hand to the firms which have voluntarily participated in the research. 57 companies were reached within the scope of the research (participation rate, 15,8 %). Within the scope of the research, scales composed by Sing (2004) were used for human resources practices, perceived organizational performance, and market performance.

3. 3. Data Collection Tool

A questionnaire was used as a data collection tool in this study. In the first part of the questionnaire, there was a scale for perceived organizational performance with 6 statements and a scale for perceived market performance with 4 statements, in the second part, there was a scale for human resources practices of firms with 7 dimensions, 36 statements. In the last part, there was an information form with 6 questions toward the firm and the respondent.

3. 4. Data Analysis

All of the scales in the questionnaire were evaluated as 5 point Likert scale. In perceived organizational performance and market performance it was from *"1: bad" to "5: very good",* in human resources practices, it was from "*1: not true at all" to "5: totally true".* The data was analyzed using SPSS for Windows 18.0 package program. The scales firstly were translated by researchers from their original form in English to Turkish then translated from Turkish to English and the validity of them was provided (Brislin, Lonner & Thorndike, 1973). Afterwards, Cronbach's Alpha values were calculated for their reliability values of the scales. The perceived organizational performance was calculated as 0,89, market value as 0,87 and human resources practices as 0,97. These values seem to be quite reliable in terms of social sciences (Kayış, 2005). Pearson correlation analysis was used to analyze the relationship between the variables and regression analysis was used in the hypothesis testing. The minimum number of samples for factor structure and KMO measurement was determined to be 100. Sample size is important for factor analysis. The number of cases must be more than the number of variables. In general, 100-200 samples are adequate for the analysis (Akgül & Çevik, 2005: 419). For organizational level analyzes, this number could not be reached due to time constraints.

3. 5. Findings and Interpretations

The average age of the firms participated in this study is 12,6 years (sd: 7,96), 23 of the respondents are female (40,4%), 32 of the respondents are male (56,1%) and 2 of them (3,5%) did not state their gender. All of the respondents have a degree of university and higher degrees. When examining the position of the employees, it is determined that 24 of them (21%) are managers and 93 of them (79%) are workers. When the results of descriptive statistics of the scales in the study are examined, it is calculated that mean for perceived organizational performance is 3,79 (sd: 0,74), mean for market performance is 3,47 (sd: 0,82) and mean for human resources practices is 3,49 (sd: 0,70). Within this scope, managers evaluated perceived organizational performance as "good". While the "adequate" level option is specified for perceived market performances, for HRM practices close to the option of "I agree" is at the forefront (Table 1).

Table 1. Descriptive Statistics

Variables	Mean	sd
Organizational performance	3,79	,73
Market performance	3,47	,82
HRM practices	3,49	,70

N=57

In the research, Pearson correlation analysis was used to determine the relationships between the variables. In this framework, a positive and strong relationship was found between perceived organizational performance and HRM practices (r= .707; ** p<0,01). Also, there is a positive and strong relationship between perceived market performance and human resources practices (r= .583; ** p<0,01, Table 2). In this sense, human resources practices can be regarded as a strong premise variable of firm performance.

Table 2. Correlations

Variables	Org. Per.	Market per.	HRM practices
Organizational performance	1		
Market performance	.689** .000	1	
HRM practices	.707** .000	.583** .000	1

*N=57, **. p < 0.01*

Main hypotheses of the research are "*H₁: There is an effect of HRM practices on perceived organizational performance*" and "*H₂: There is an effect of HRM practices on perceived market performance*". Regression analysis was used to test these hypotheses.

Tablo 3. Coefficients[a]

Independent Variable	R^2	Adj. R^2	F	t	p
HRM practices	0.499	0.49	54.867	7.407	.000 ***

***p< .001; a. Dependent Variable: Organizational Performance

According to the results of the regression analysis in Table 3, it is found that HRM practices explain 49,9% of the variation in perceived organizational performance and there is an effect of HRM practices on perceived organizational performance (R^2 =0.499, *** p<.001). Besides this, according to the results in Table 4, it is found that HRM practices explain 34% of the variation in market performance and there is an effect of HRM practices on market performance (R^2 =0.34, ** p<.001). As a result of hypothesis testing, it has been seen that organizational approach supporting human resource applications has an effect on firms' organizational

performance and market performances. It can be thought that this effect can help to ensure the sustainability of similar organizations.

Tablo 4. Coefficients[a]

Dependent Variable	R^2	Adj. R^2	F	T	p
HRM practices	0.34	0.33	28.354	5.326	.000 ***

***p< .001; a. Dependent Variable: Market performance

4. Conclusion and Suggestion

One and perhaps the most important source of today's businesses' competitive advantage is the human resource. In this context, it will be possible to attract and retain personnel which will be employed in businesses and especially in Technopark firms operating in software and information field with effective application of human resources activities. In this sense, this research attempted to investigate the effect of human resources practices on perceived organizational performance and market performance and also the direction of these effects. Training, performance appraisal, career planning, involving in decision making, job definition, worker selection process and wage are selected as human resources practices. In this research, a questionnaire study was carried out with 57 firms operating in Technopark located at Yıldız Technical University and the hypotheses were tested with the obtained data.

As a result of this study, positive and high relationships between human resources practices and perceived organizational performance and market performance were determined. Moreover, it's found that human resources practices have an explanatory power of approximately 50% on perceived organizational performance and an explanatory power of 34% on market performance.

The results of this research are similar to those researches such as Akdere, 2009, Rodwell & Teo, 2008, Chow, Teo, & Chew, 2013 and Ojo, 2011; Gürbüz, Mert, 2011 in the literature. As a result of the study, it is emphasized that Technopark companies need to invest in human resources practices in terms of sustainability. In this context, it is important for Technopark firms to pay attention to selection and recruitment process, training and development opportunities, performance evaluation and compensation issues.

It is not possible to generalize the results for all businesses since the obtained information is limited to the firms operating in Yıldız Technopark. Also, since Technopark firms do not share original performance data in accordance with the privacy policy, the measurement of organizational performance variable is limited to perceptual level.

In addition, the impact of human resource practices on organizational performance and market performance can be influenced by many factors. These factors can be listed as developments and uncertainties in the

economic situation, legal regulations, industrial relations and social policies. Therefore, it should be taken into consideration that such factors may affect organizational performance and market performance. It will be useful to develop this study and investigate other Technoparcs as it will provide an opportunity to make a comparison.

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9

Management Practices towards the Integration of Sustainability in Turkish Universities

Solomon Chukwuemeka Ugbaja

Refika Bakoglu

Abstract

The purpose of this study is to observe and evaluate the integration of sustainability practices in Turkish universities. The main research question of the study is: How are Universities integrating sustainability practice in sustainability focused universities in Turkey as far as CORE system (Curriculum, Operations, Research, and Engagement) is considered? The employed research methodology mainly relies on content analysis of the UI GreenMetric and universities' websites of selected universities from the UI Green Metric Sustainable University assessment and ranking index to observe Turkish universities' integration of sustainability practices. The UI Green Metric Sustainable University assessment index is selected since it considers the Operations, Curriculum, Research and Engagements (CORE system) of universities with indicators such as Setting and Infrastructure, Energy and Climate Change, Waste, Water, Transportation and Education. This covers the triple bottom line of sustainability (Environment, Economy and Society) which other indexes like GASU, AASHE: STAR, ESM and others, focused mostly on operational Eco-efficiency in developed countries. The sample of the study is selected from four hundred and seven (407) top sustainable universities ranked by UI GreenMetric. The total population observed and evaluated in this study is top eleven (11) Sustainability focused Universities in Turkey according to UI GreenMetric sustainable index. It is obvious that from observation made in this study, that the studied universities have sustainability as part of their goals and have plans, policies, strategies and have gone ahead to integrate some of their sustainability goals. The result shows a significant progress in some Operational practices of the CORE system. There was a less significant progress in the Curriculum, Research and Engagement practices of the CORE system of sustainability-oriented practices which are being integrated in the studied universities.

Keywords: Sustainability Practices, Management, Integration, Turkish Universities.

Introduction

The need for the integration of sustainability practices in both government and non-governmental educational institutions has become increasingly apparent during the last decades. Universities being the essential part of the global economy and since they prepare most of the professionals that develop, manage and teach in public, private and non-profit institutions, they are uniquely positioned to influence the direction of a sustainable society. Consequently, as major contributors to the values, health and well-being of society, universities have a fundamental responsibility to teach and research for sustainability. This is essential because future professionals will be working globally with companies that increasingly have sustainability on their agenda. This puts high demands on universities to integrate sustainability in their institutions so that this mentality interpenetrates all activities as a university identity. The relevance of the present research links to current discussions regarding sustainability approaches in universities. Universities have begun to recognize the need to reflect the reality that humanity is affecting the environment in ways which are historically unprecedented and which are potentially devastating for both natural ecosystems and us. The success of universities in the twenty-first century will be judged by the ability to put forward a bold agenda that makes sustainability and the environment a cornerstone of academic practice (Cavas *et al.*, 2014).

This is a great concern among universities, for example, to increase their students' awareness and commitment to sustainable practices. As a result, student organizations and special events have emerged to focus on sustainable practices regarding transportation, construction, energy, waste, food, water, and landscaping (Emanuel, 2010) By seeking to integrate sustainability in the system, many higher education institutions are adopting specific sustainable management systems (Clarke & Kouri, 2009). A management system is usually based on management by objectives (Lundberg *et al.*, 2009), in which the principal aim refers to the process of directing and controlling employees and work units, and motivating them towards performances regarding specific set of objectives. Although, higher education institutions are interested in performing under a variety of objectives in their management system, this research focuses on those related to sustainability. To significantly address these problems, university management practices have the potential to contribute to the integration of sustainability (Vecchio, 2012). Hence, an approach as the one presented here can contribute to research regarding sustainability-oriented practices in universities (Emanuel & Adams, 2011). It is the above problems that set the stage of this study in observing management practices towards the integration of sustainability in the top sustainability focused Turkish universities.

Background

The Brundtland Report *Our Common Future* defined sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987), foregrounds the interconnections of the economic, social, and environmental aspects of corporate actions (the 'triple bottom line'). Recently, several definitions of sustainable higher education institutions have emerged (Madeira *et al.*, 2011*)*. Alshuwaikh and Abubakar (2008) argued that a sustainable campus should be environmentally healthy, with a prosperous economy

through energy and resource conservation, waste reduction and with efficient environmental management; it should promote equity and social justice and export these values to the community. According to Milutinovic and Nikoli (2014), the vision of sustainable development in higher education is a world where everyone has the opportunity to benefit from a quality education and learn the values, behaviors and lifestyles required for a sustainable future and for positive societal transformation (Jorge *et al.,* 2013)

In the last two decades, an increasing number of higher education institutions have been engaged in integrating sustainability into their systems (Ceulemans *et al.*, 2011; Lozano *et al.*, 2013; Shephard & Furnari, 2013). This is arguably due to the increased level of consciousness in society of sustainability issues and the significant impacts of campus activities on both the environment and communities (Alshuwaikhat & Abubakar, 2008; Lozano, R, 2006). This contribution can occur within the context of education, research, outreach/engagement and the administrative management of the university itself (Alshuwaikhat & Abubakar, 2008; Jabbour, 2010). Therefore, it is necessary to evaluate how universities have been contributing towards the integration of Sustainability (Leal Filho, 1997, de Castro, *et al.*, 2012). Sustainable development rests on three pillars - economic, environmental and social - as mentioned above. These three dimensions are often used in various development programs and can be seen as the triple bottom line. It is important that each dimension gives equal consideration to ensure a sustainable outcome (Rogers *et al.*, 2008).

Figure 1. Pillars of Sustainability

Figure 1 shows that to get sustainable results a fine balance must be reached between the three components. If one component overpowers the others, the outcome will be unsustainable.

Education for Sustainable Development

Blewitt (2010) opined that a new graduateness as well as a new approach to university education is required. The International Association of Universities (IAU, 2006) acknowledges that universities have not been producing graduates with the skills, motivation and knowledge necessary to promote sustainability. Despite some considerable advances in Education for Sustainable Development (ESD) in various places there has been no curriculum main streaming of sustainability as there has been with equal opportunities. This is partly due

to a lack of knowledge and to some extent a suspicion that sustainability and, its sister concept sustainable development, are inexact, unscientific and too controversial to be operationalized effectively. The theory and practice ESD is not always easy to grasp. It relates to the social, economic, cultural, ethical and spiritual dimensions, will differ according to time, place and culture and, in curriculum terms, invite a trans-disciplinary, systemic and holistic approach that addresses value, attitude, affective, skill and knowledge development. Wals and Jickling (2002) write:

> *Integrating aspects of sustainability cannot be realized without thinking very critically about the re-structuring of didactical arrangements. This re-orientation requires ample opportunity for staff members and students to embark on new ways of teaching and learning. For this to happen they have to be given the opportunity to re-learn their way of teaching and learning and to re-think and to re-shape their mutual relationships. These new didactical arrangements pre-suppose a problem orientation, experiential learning and lifelong learning.*

Helpfully, as part of the decade for ESD which we are now over half way through, UNESCO in 2005 has identified a number of key ESD characteristics. ESD:

a.   is based on the principles and values that underlie sustainable development;

b.   deals with the well-being of all three realms of sustainability – environment, society and economy;

c.   promotes life-long learning;

d.   is locally relevant and culturally appropriate;

e.   is based on local needs, perceptions and conditions, but acknowledges that fulfilling local needs often has international effects and consequences;

f.   engages formal, non-formal and informal education;

g.   accommodates the evolving nature of the concept of sustainability;

h.   addresses content, context, global issues and local priorities;

i.   builds civil capacity for community-based decision making, social tolerance, environmental stewardship, adaptable workforce and quality of life;

j.   is interdisciplinary. No one discipline can claim ESD for its own, but all disciplines can contribute to ESD; and

k.   uses a variety of pedagogical techniques that promote participatory learning and higher order thinking skills.

Considering the above assertions, (Selby, 2007) stresses the urgency of our global predicament seeing the role of Higher Education (HE) as needing to prepare us for contraction. Climate change, excessive resource use and overpopulation requires formal and informal education to help nurture alternative and localized conceptions of the "good life" together with more holistic ways of mediating and interpreting reality. Learning in HE needs a keener appreciation of complexity, such as the multiple ramifications and reverberations of human action. Selby also recognizes the inherent complacency or lack of engagement in the

view that the academy exists only for disinterested contemplation and reflection. HE certainly needs to offer learners this space, but overall the sector needs to do more than monitor the demise of yet another human civilization.

HE must therefore be focused on more than simply delivering employability or servicing the business as usual economy. It must encompass: a civil component – community engagement going beyond encouraging student and staff volunteering; a political component – skills of decision making, leadership, conflict negotiation and values/moral education; and, our rights and obligations to other people, other species and the planet as a whole. It needs to be more eco-centric. Graduates need to prioritize actions, balance environmental, social and economic costs and benefits, understand the needs and perspectives of others and, through both a generic understanding of sustainability and through their own disciplinary knowledge and expertise, be able to work in an inter-professional and intercultural manner.

Furthermore, Clugston and Calder (2003) agrues that one way of developing a sustainability curriculum in HE is to develop learning around the key concepts of sustainability rather than a set of concepts located within each traditional disciplinary area. This needs to be married to a trans-disciplinarility and Mode 2 knowledge (Gibbons *et al.,* 1994) which, as (Harloe & Perry, 2005) suggested, is the key to HE successfully engaging with a diverse range of intellectual, economic and social interests where both knowledge creation activities and research findings are disseminated interactively, in real and virtual time, and where research groups are networked globally with participants from a range of public, private and third-sector institutions. This will lead to the embeddedness of sustainability knowledge and skills in universities in an effective way.

Scholars have stressed the basic types of activities given in higher education institutions assessing the main elements in this transformative process towards sustainability (Hills *et al.*, 2011, Christensen, *et al.*, 2009, Ferrer-Balas, D., 2008). For instance, Christensen *et al.*, identified that the main activities are related to the fields of operation and maintenance, teaching, research, and outreach which is engagement and cooperation with local communities, companies, the media, *etc.* (Christensen *et al.*, 2009). Similarly, different definitions focus on the activities as a C.O.R.E. system (Hills *et al.*, 2011). The abbreviation stands for curriculum, operations, research and engagement. The CORE model is presented as a "campus-wide guide for holistic implementation of campus sustainability initiatives" (Hills *et al.*, 2011). Models like these are based on assessments as the one of Lukman and Glavic. (Lukman & Glavic, 2007) argued that desirable outcomes of sustainability-oriented practices are those fostering "research, technical development and innovations within a knowledge-based society". Lukman and Glavic also argued that incorporating sustainability-oriented practices into everyday activities involves a further identification of variables such as "management performance (vision, mission, statement, strategy, and sustainability council/ coordinator), education and research (programmes, curriculum, teaching methods), operations, forming networks and reporting to stakeholders (assessment tools, sustainability indicators)". The construction of a framework of sustainability assessment in universities is enriched by the C.O.R.E system/model in approaches to management practices.

Sustainability in Turkish Higher Education

According to Cavas *et al.* (2014), Turkey is at the very beginning stage of integrating the concept sustainability in the higher education curriculum as reflected by Tuncer, Tekkaya, and Sungur (2006). In addition, (Alkış & Öztürk, 2007) and (Şahin, 2008) stressed the need for Higher education to integrate the concept of sustainability into their curriculum, for having responsible growing future generations. The authors reported that, candidate teachers in Turkey were far neither understanding nor integrating the sustainability into their subject area. According to the authors, teachers participated in such studies had explained sustainability related only with environmental protection and failed to correlate the concept with economy, cultural diversity, human rights, etc. Therefore, depending on the related literature, it is obviously promising to evaluate the integration of sustainability in Turkish universities, where there are only a few studies on the issue.

Sustainability Assessment Tools

According to the sustainability model (Fig. 2). Sustainability refers to the holistic and interconnected phenomena of economic, environmental, and social aspects (Lozano, 2010). Sustainability oriented practices are always multidimensional and are organized within the economic, environmental and social dimensions. Strictly one-dimensional activity (*e.g.* Environmental) hardly exists, since it is always related to economic and social effects. University's performance aspects (research, education, and environmental protection) are interconnected, multidimensional, too. They should all be evaluated when the sustainability of the University is under consideration. Research, development, investment and matriculation are aspects, which are closely linked with an economic dimension of the development of universities.
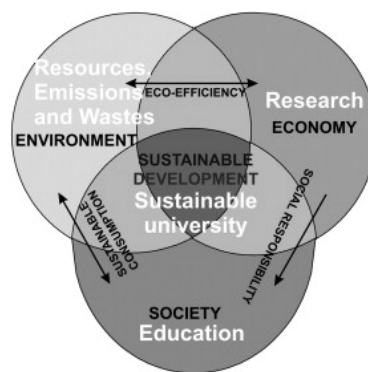
Figure. 2 A Sustainable Development model (Lukman, 2007)

Table 1. Indicators used in assessing and ranking Sustainability in Universities by UI GreenMetric

No.	Categories and Indicators	Points Weighting
1	**Setting and Infrastructure (SI)**	**15%**
SI 1	Open space area/total area	300
SI 2	Open space area/total people	300
SI 3	Area on campus covered in forested vegetation	200
SI 4	Area on campus covered in planted vegetation	200
SI 5	Non-retentive surfaces/total area	300
SI 6	Sustainability budget/total university budget	200
Total		**1500**
2	**Energy and Climate Change (EC)**	**21%**
EC 1	Energy efficient appliance usage	300
EC 2	Renewable energy usage policy	300
EC 3	Total electricity use/total people	300
EC 4	Energy conservation program	300
EC 5	Green building	300
EC 6	Climate change adaptation and mitigation program	300
EC 7	Greenhouse gas emission reduction policy	300
Total		**2100**
3	**Waste (WS)**	**18%**
WS 1	Recycling program for university waste	300
WS 2	Toxic waste recycling	300
WS 3	Organic waste treatment (garbage)	300
WS 4	Inorganic waste treatment (rubbish)	300
WS 5	Sewerage disposal	300
WS 6	Policy to reduce the use of paper and plastic on campus	300
Total		**1800**
4	**Water (WR)**	**10%**
WR 1	Water conservation program	500
WR 2	Piped water	500
Total		**1000**
5	**Transportation (TR)**	**18%**
TR 1	Total cars entering/total people	200
TR 2	Total bicycles/total people	200
TR 3	Transportation policy on limiting vehicles on campus	400
TR 4	Transportation policy on limiting parking space	400
TR 5	Campus buses	300
TR 6	Bicycle and pedestrian policy	300
Total		**1800**
6	**Education (ED)**	**18%**
ED 1	Sustainability courses/total courses	300
ED 2	Sustainability research funding/total research funding	300
ED 3	Sustainability publications	300
ED 4	Sustainability events	300
ED 5	Sustainability organizations (student)	300
ED 6	Sustainability website	300
Total		**1800**
TOTAL		**10000**

Reference: http://greenmetric.ui.ac.id/ranking-2016/

The assessment of sustainability in universities has been examined with a number of critical reviews and meta-analyses on the use of various assessment tools. UI GreenMetric a global sustainability assessing and ranking tool for university addresses this lack. The mission for the assessment and ranking of UI GreenMetric was that it is of interest and accessible to universities in developing countries as well as to those in developed countries. It provides an entry-level tool for assessing campus sustainability efforts. The assessment and ranking emerged out of a number of disparate concerns and realizations regarding the challenge of introducing sustainable concepts in a Sustainability Environmental Assessment (SEA) context. The other aspects of the mission for the assessment and ranking were that it be global in scope, raise awareness in sustainability and be a driver of change (Lauder, 2015).

Looking at the above assertions in Table 1, in order to achieve a quantitative study in this research, these cardinal dimensions of sustainability interwoven with the C.O.R.E System/Model (Curriculum, Operation, Research and Engagements) would be used in observing the sustainability oriented-practices of the eleven top Turkish Sustainability focused universities according to UI GreenMetric.

Main Focus of the Chapter

This research observed and evaluated the management practices towards the integration of sustainability in Turkish universities. It is intended by this research using content analysis of UI GreenMetric and universities' websites to observe universities integration and management practices related to sustainability to answer the main question of the study, which is: How are management integration sustainability in sustainability focused Turkish universities as far as CORE system (curriculum, operations, research, and engagement) is considered? The UI GreenMetric Sustainable University assessment and ranking index was selected since it considers the Operations, Curriculum, Research and Engagements (CORE system) of universities with indicators such as Setting and Infrastructure, Energy and Climate Change, Waste, Water, Transportation and Education. This covers the triple bottom line of sustainability (Environment, Economy and Society) which other indexes like GASU, GEENSHIP, AASHE: STAR, ESM and others, focused mostly on operational Eco-efficiency.

Procedure for Data Collections and Analysis

The sample of the study was selected from four hundred and seven (407) top sustainable universities in the world ranked by UI GreenMetric 2014 and 2015. The total populations of the study observed and evaluated in this study are top eleven (11) Sustainability focused Universities in Turkey according to UI GreenMetric sustainable ranking index. The study sample includes Bulent Ecevit University (Zonguldak Karaelmas University), Ozyegin University, Sabanci University, Karabuk Universitesi, Selçuk Üniversitesi, Inonu University Malatya, Kilis 7 Aralik University, Ankara University, Izmir University of Economics, Bilkent University and Celal Bayar University. The data collection was carried out between October and November, 2016. In order to qualify and quantify the data, the researcher used descriptive data analysis to determine the authenticity of the situation at stake. Descriptive data analysis involves the calculation of percentage distribution. This method of data analysis was used because percentage explains precisely the state of things

without the complexities of other statistical methods. The data analysis used in this study involves tables, charts and diagrams which describes the common sustainability practices in the selected universities.

Finding and Evaluation

The result showed that, though to different extent, top Turkish Sustainability focused universities have taken sustainability seriously and are making effort to integrate it in their universities. Table 2 presents the result of the UI GreenMetric assessment and ranking 2014 and 2015 for the selected universities in Turkey and their scores on each indicator.

Table 2: UI GreenMetric 2014/2015 Sustainability Assessment and Ranking of top Turkish Sustainability ocused Universities.

CORE System		Total Score		Operation										Curriculum, Research & Engagement	
UI GreenMetric Sustainability indicators				Setting and Infrastructure		Energy and Climate Change		Waste		Water		Transportation		Education	
		10000		1500		2100		1800		1000		1800		1800	
Ranking / University		2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
1 (217)	B.Ecevit University	4708	4171	763	814	1100	925	900	975	735	175	800	900	410	382
2 (260)	Ozyegin University		3764		378		950		975		566		453		442
3 (276)	Sabanci University	4121	3622	743	645	710	666	1050	1200	660	334	525	380	432	397
4 (283)	Karabuk University	4509	3583	446	421	985	731	825	825	425	245	1325	902	503	459
5 (303)	Selçuk University	2891	3405	519	753	400	301	900	1350	250	100	625	836	197	65
6 (320)	Inonu University	3020	3175	520	465	1025	676	525	975	350	635	525	376	75	48
7 (341)	Kilis 7 Aralik University		2995		486		410		750		540		751		58
8 (345)	Ankara University	3670	2960	520	743	850	467	1050	750	550	179	325	602	375	219
9 (359)	Izmir University of Econ.	4178	2780	515	427	885	593	825	825	705	175	925	463	323	297
10 (378)	Belkent University	3082	2458	621	578	610	457	750	750	500	250	525	379	76	44
11 (404)	C. Bayar University	2260	1738	585	578	225	82	300	300	500	250	575	301	75	227

Reference: http://greenmetric.ui.ac.id/ranking- 2016/

Figure 3. Analysis of Top Turkish Sustainability focused Universities overall performance between 2014 and 2015 with Bar and Radar Chart.
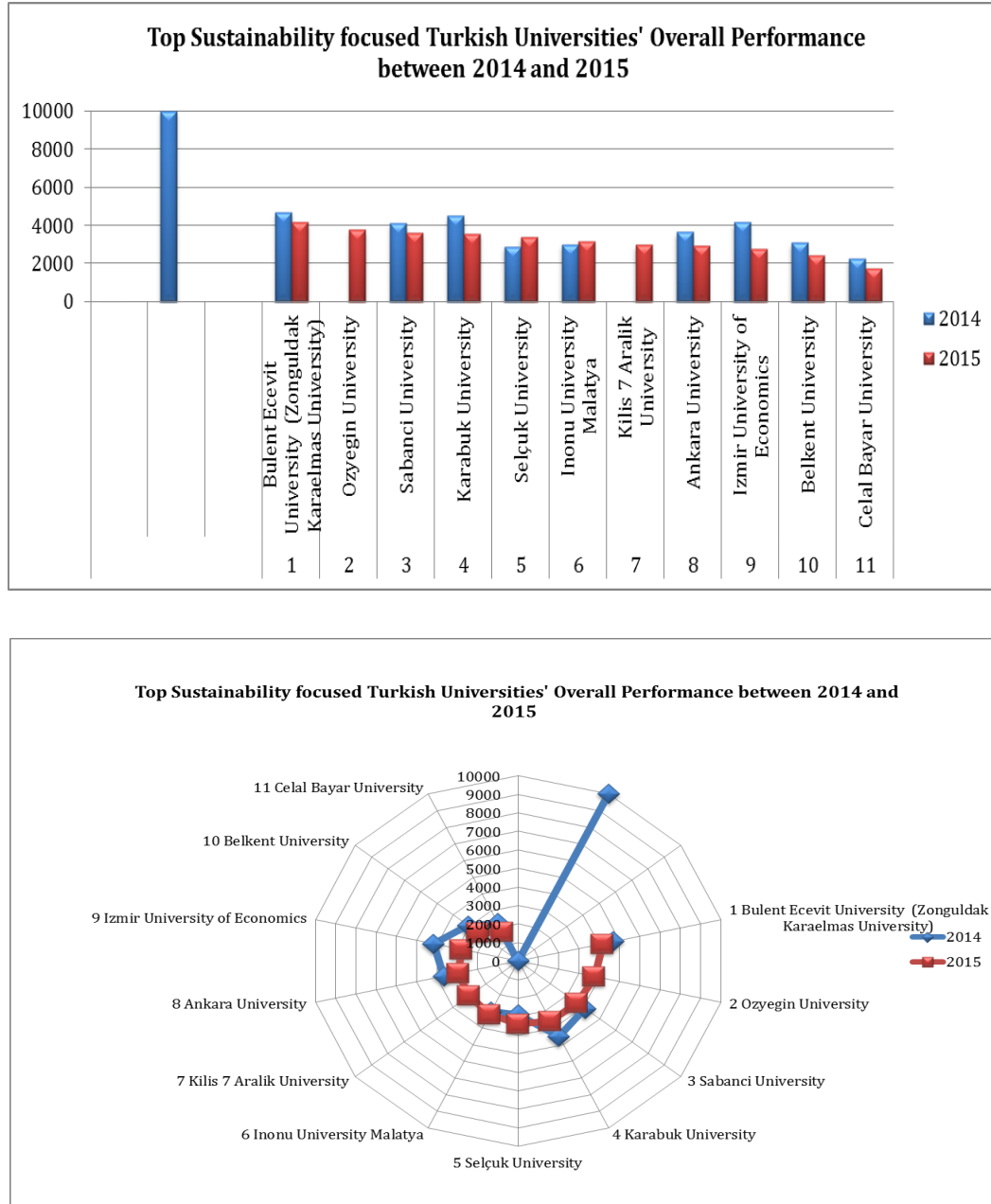
Considering the analysis of Figure 3, it is obvious that the eleven top sustainability focused universities performed below average in the general integration of sustainability practices in 2014 and 2015 according to the result of UI Greenmetric overall sustainability assessment index. There was a decrease in the overall performance in Bulent Ecevit University (Zonguldak Karaelmas University), Sabanci University, Karabuk Universitesi, Kilis 7 Aralik University, Ankara University, Izmir University of Economics, Bilkent University

and Celal Bayar University in 2015 while Selçuk Üniversitesi and Inonu University Malatya recorded an increase.

Table 3: Percentage Analysis of Selected Top Turkish Sustainability focused Universities' Sustainability Practices using CORE System and UI GreenMetric Indicators Between 2014 and 2015

CORE system		Operation											Curriculum, Research & Engagement	
UI GreenMetric Sustainability indicators		Setting and Infrastructure		Energy and Climate Change		Waste		Water		Transportation		Education		
		100%		100%		100%		100%		100%		100%		
Ranking/ University		2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015	
1	B.Ecevit University (Zonguldak Karaelmas Un.)	50.9	54.3	52.4	44	50	54.2	73.5	17.5	44.4	50	22.8	21.2	
2	Ozyegin University		25.2		45.2		54.2		56.6		25.2		24.6	
3	Sabanci University	49.5	43	33.8	31.7	58.3	66.7	66	33.4	29.2	21.1	24	22.1	
4	Karabuk University	29.7	28.1	46,9	34.8	45.8	45.8	42.5	24.5	73.6	50.1	27.9	25.5	
5	Selçuk University	34.6	50.2	19.0	14.3	50	75	25	10	34.7	46.4	10.9	3.6	
6	Inonu University Malatya	34.7	31	48.8	32.2	29.2	54.2	35	63.5	29.2	20.8	4.2	2.7	
7	Kilis 7 Aralik University		32.4		19.5		41.7		54		41.7		3.2	
8	Ankara University	34.7	49.5	40.5	22.2	58.3	41.7	55	17.9	18.1	33.4	20.8	12.2	
9	Izmir University of Economics	34.3	28.5	42.1	28.2	45.8	45.8	70.5	17.5	51.4	25.7	17.9	16.5	
10	Belkent University	41.4	38.5	29	21.8	41.7	41.7	50	25	29.2	21.1	4.2	2.4	
11	Celal Bayar University	39%	38.5	10.7	3.9	14.3	14.3	50	25	31.9	16.7	4.2	12.6	
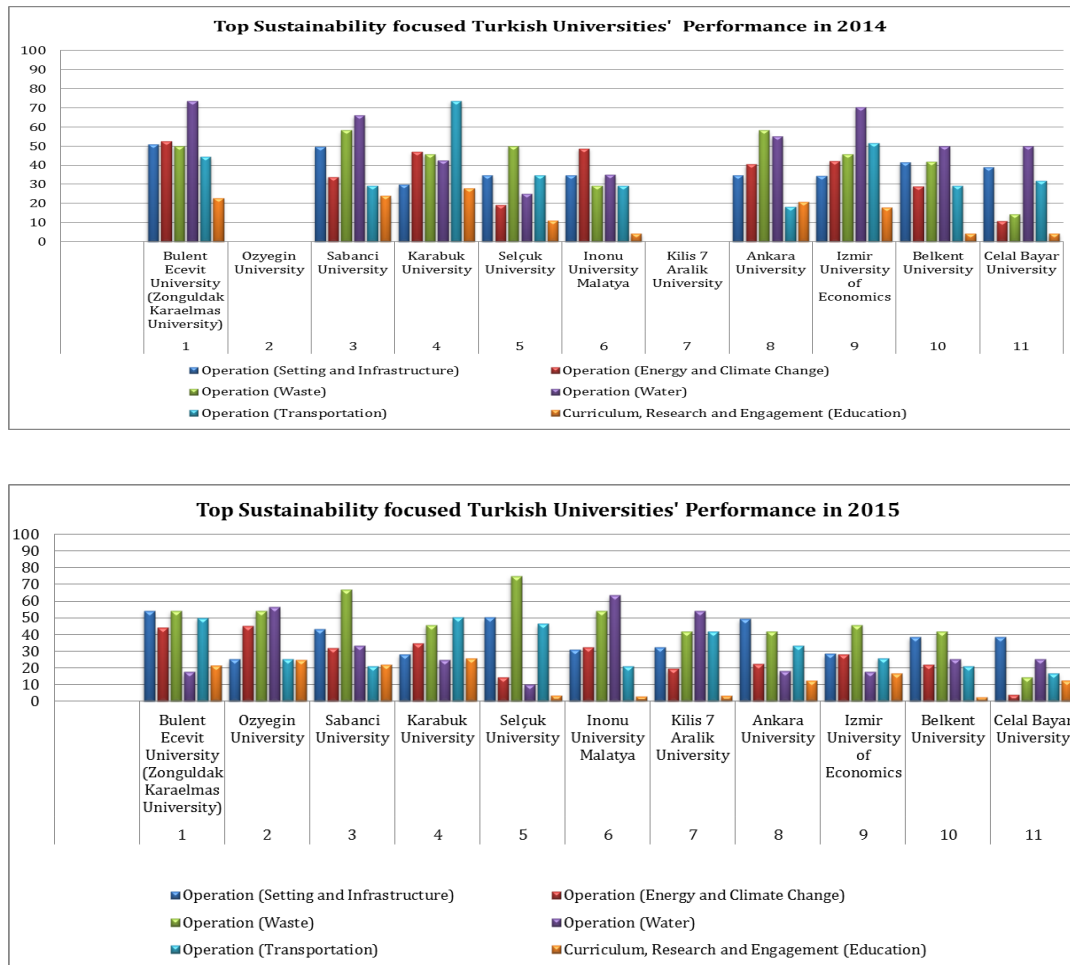
Figure 4. Analysis of the Sustainability practices in the studied Universities using the CORE system and UI GreenMetric Sustainability Indicators between 2014 and 2015.

Table 3 presents the percentage analysis of the selected top sustainability focused Turkish universities on the sustainability practices in 2014 and 2015 using the CORE system. The Operational aspect of the system involves the setting and infrastructure, Energy and Climate change, Waste, Water and Transportation. While the Curriculum, Research and Engagement (Outreach) are all under Education according to the UI GreenMetric sustainability assessment indicators.

Operation (Setting and Infrastructure, Energy and Climate, Waste, Water and Transportation)

Figure 4 show the result of the eleven selected top sustainability focused Turkish universities performance under Operation in CORE system. In the area of Setting and Infrastructure which consist of; Campus setting, Total areas on campus, Areas on campus covered in forested vegetation, Areas on campus covered in planted vegetation (including lawns, gardens, green roofs, internal planting), Total ground floor area of buildings, Number of academic staff and administrative staff, University budget for Sustainability effort and

Retention: Non-retentive surface for water absorption on campus. Bulent Ecevit University (Zonguldak Karaelmas University), maintains a lead over the rest universities with an above average percentage point of 50.9% in 2014 and 54.3 in 2015 followed by Selçuk University with below average point of 34.6% in 2014 and above average point of 50.2% in 2015. The rest of other universities were below average in both years. This shows that in the area of Setting and Infrastructure, which gives the basic information of the university consideration towards a green environment. The scores in Figure 4, shows that the eleven university campuses are still less below from being called Green Campus because of the Setting and Infrastructure on campus, which is for universities to provide more space for greenery and safeguarding the environment.

Figure 4 also presents the bar chart analysis of the performance of the selected universities in Energy conservation and mitigating climate change. This involves the energy efficient appliance usage, renewable energy usage policy, total electricity use, energy conservation program, green building, and climate change adaptation and mitigation program, greenhouse gas emission reduction policy. Ecevit University (Zonguldak Karaelmas University) leads with 52.4% point in 2014 and 44% which is below average in 2015. The rest of the other universities were below average in both years. This indicates that the top Turkish Sustainability focused universities are still behind in commitment about environmental issues and should try their best in mitigating climate change. Base on the result of the analysis of Figure 4, Universities are still expected to increase their efforts in energy efficiency to attain a high extent of the Eco-efficiency level of sustainability in their universities.

In the area of waste, this has to do with recycling program at the university, toxic waste recycling, organic waste treatment, inorganic waste treatment, sewerage disposal, policy to reduce the use of paper and plastic on campus activities which are major factors in creating a sustainable environment. Figure 4 shows that Bulent Ecevit University (Zonguldak Karaelmas University) with 52.4% /54.2%, Ozyegin University with 54.2%, Sabanci University with 58.3% /66.7% and Selçuk Üniversitesi with 50% /75% scores in both 2014 and 2015, have been able to manage the activities of university staff and students on campus to a large extent in reducing the production of waste through some programs and waste treatments which have been implemented and are been attained in these universities. While Inonu University Malatya recorded 29.2% /54.2% and Ankara University with 58.3% /41.7% scores in both 2014 and 2015. The rest of other universities were below average in both years.

Furthermore, in the area of water conservation, this involves universities decreasing of water usage, water conservation program, piped water uses and protection of the habitat. Ozyegin University recorded 56.6 % and Kilis 7 Aralik University with 54% progress in decreasing their water usage on campus, increase water conservation program, and protect the habitat to a large extent in achieving water conservation in 2015. While Bulent Ecevit University (Zonguldak Karaelmas University) with 73.5% /17.5%, Sabanci University with 66% /33.4%, Ankara University with 55% /17.9%, Izmir University of Economics with 70.5% /17.5%, Bilkent University with 55% /25%, and Celal Bayar University with 55% /25% made progress in 2014 but were below average in 2015. Inonu University Malatya recorded below average of 35% in 2014 and was above average of 63.5% in 2015. Karabuk University and Selçuk University were below average in both years.

In the area of transportation, Karabuk University leads with a 73.5 % score in 2014 and 50.1% in 2015 followed by Bulent Ecevit University (Zonguldak Karaelmas University with 44.4%/50% and Izmir University of Economics with 51.4%/25.7. The rest of other universities were below average in both years. Knowing that, transportation system plays an important role on the carbon emission and the pollutant level in university. The managements of the studied universities have, to integrate transportation policy to limit the number of motor vehicles on campus, the use of campus bus and bicycle was encouraging for a healthier environment. The pedestrian policy which encourages students and staff to walk around campus, and avoid using private vehicle and the use of environmentally friendly public transportation which decreases the carbon footprint around campus were implemented. There is a need for more commitment from universities in the area of transportation in decreasing carbon footprint around campus.

Curriculum, Research and Engagement (Education)

Curriculum, Research and Engagement (Outreach) which forms the rest of the CORE system are under Education which includes; *Curriculum:-* Number of courses related to environment and sustainability offered, Total number of courses offered, *Research:-* Total research funds dedicated to environmental and sustainability research, Total research funds and Number of scholarly publications on environment and sustainability published and *Engagement:-* Number of scholarly events related to environment and sustainability, Number of staff and student organizations related to environment and sustainability and Existence of a university sustainability website.

The above finding from Figure 4 shows that the eleven top Turkish Sustainability focused Universities are really below average in integrating sustainability in their curriculum, research and engagement programs. This shows that studied universities are yet to integrate fully in their curriculum more courses related to sustainability. In the area of Research, universities are yet to fully encourage research on sustainability related topics both to students and staff, which should be multidisciplinary and interdisciplinary research in sustainability. Universities have not, to a large extent published research with focus on sustainability-related issues. In the area of Engagement (Outreach), Universities have not been able to fully encourage enough sustainability activities/ projects related to community services and development. This is very important considering the critical role universities have in creating the new generation concerned with sustainability since they prepare most of the professionals, who manage and teach both public and private institutions in the society because as major contributors to the values, health and wellbeing of society, universities have a fundamental responsibility to teach, train and research for sustainability. This development is essential, as future professionals will be working globally with companies that increasingly have sustainability on their agenda.

Table 4 shows the sustainability web page links of the studied top Turkish sustainability focused Universities. This research also studied the content of the top university official sustainability website pages to analyze the common sustainability practices in the studied universities.

Table 4. Top Turkish Sustainability focused Universities and their Sustainability web page Links

Ranking	University	Sustainability Website
1	Bulent Ecevit University (Zonguldak Karaelmas University)	http://web.beun.edu.tr/cesam/
2	Ozyegin University	http://www.ozyegin.edu.tr/energy
3	Sabanci University	http://iicec.sabanciuniv.edu
4	Karabuk Universitesi	http://agaclandirma.karabuk.edu.tr/tr/index.php?m=
5	Selçuk Üniversitesi	http://www.selcuk.edu.tr/
6	Inonu University Malatya	https://www.inonu.edu.tr/
7	Kilis 7 Aralik University	http://www.kilis.edu.tr/
8	Ankara University	http://cevre@ankara.edu.tr
9	Izmir University of Economics	http://www.ieu.edu.tr/
10	Bilkent University	http://w3.bilkent.edu.tr/bilkent/
11	Celal Bayar University	http://www.bayar.edu.tr
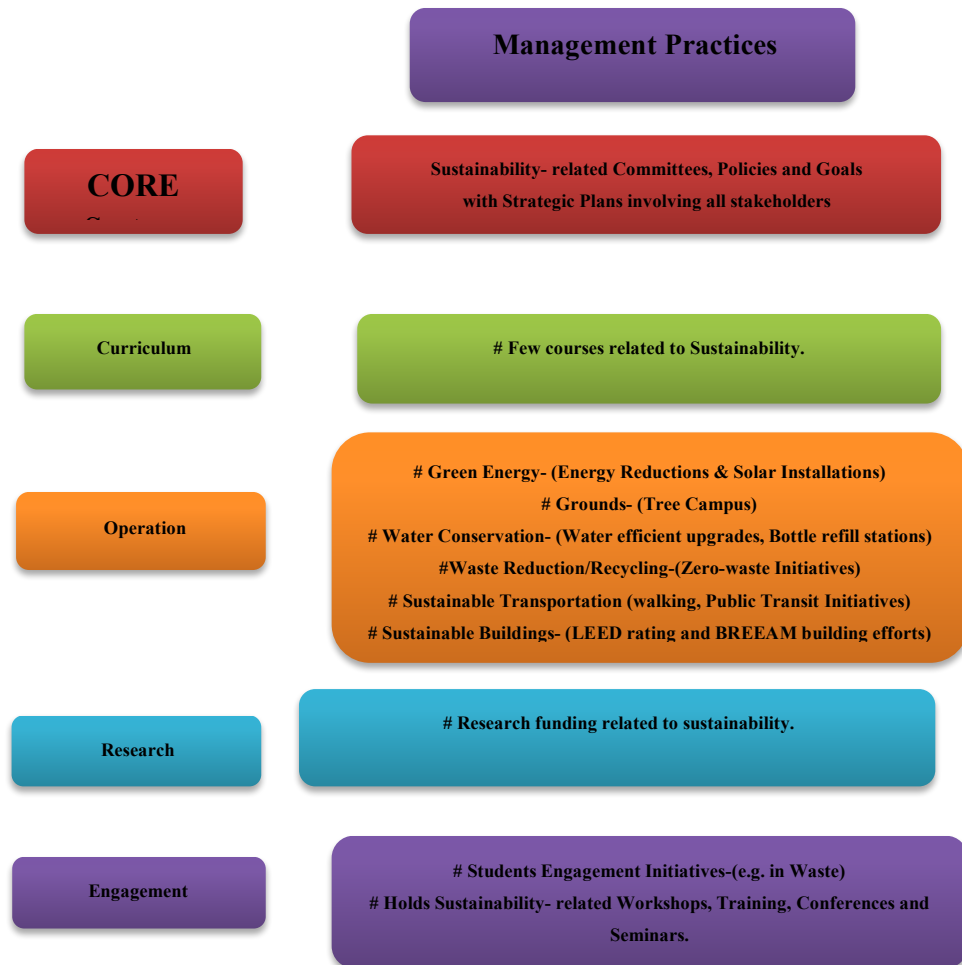
Figure 5. Common Management Practices towards the Integration of Sustainability in the studied Turkish Universities

Solutions and Recommendations

The recommendations that the researcher can make from the findings of this research which shows there are still areas of improvement in the integration of sustainability practices for the studied universities are as follows: (a) Universities should engage more in the delivery of a sustainable campus infrastructure with all construction and refurbishment projects rated BREEAM (Building Research Establishment Environmental Assessment Methodology) excellent; (b) increase the number of people commuting by walking, cycling and car sharing; (c) maximize biodiversity on campus and find more opportunities to create green environments; (d) create a sustainable food culture, providing fair-trade products where possible and working with local food partners to increase the demand and supply of seasonal, local and organic food, (e) integrate sustainable procurement by ensuring the University purchases from socially, ethically and environmentally responsible businesses; (g) support the community and local, regional and social enterprise through business community partnerships; (h) work hard in the provision of education for sustainable development; (i) engage more in the development of education potential for sustainable development by enriching learning across the formal and non-formal curriculum; (j) work for the promotion and advancement of education for sustainable development research in relation to enhancing the students and staff experience and building a more sustainable university (k) advance the central role of education and learning in furthering the University's cross-institutional sustainability agenda - and in relation to sustainability leadership and profile in the Higher Education sector; (l) undertake substantial sustainability research to deliver solutions to the world's most pressing sustainability problems; (m) facilitate internal communications and enhance internal research interaction for sustainability; (n) promote sustainability research, making the Institute of Sustainability Solutions Research the single point of contact for organizations wanting to engage with the University on sustainability; (o) they also need to increase the impact of sustainability research; (p) support understanding of multi-disciplinary funding; and (q) identify and communicate funding opportunities and support teams and their project ideas for sustainability research.

Conclusion

This study shows that all the eleven Top Turkish Sustainability focused universities studied are integrating sustainability in their Universities. The focus of this research was on answering the question: ***How are Universities integrating sustainability-oriented practices in sustainability focused Turkish universities as far as CORE system (Curriculum, Operations, Research, and Engagement) is considered?*** It is obvious that from observations made in this study, that the studied universities have sustainability as part of their goal and have plans, policies, strategies and have gone ahead to integrate some of their sustainability goals in order to meet up with the demand that is on universities to bring about sustainable society starting from their management practices. From the findings, the eleven universities need to increase their efforts in the Operational Eco--efficiency (Setting and infrastructure, Energy and Climate Change, Waste reduction/ recycling, Water conservation and Transportation) aspect of the CORE system. Also, in the area of Education which consists of (Curriculum, Research and Engagement) in the CORE System, all the studied universities performed

below average and need to really make more commitment in this aspect of sustainability which is very important in the education of the students and the society about sustainability.

There is need for the studied universities to increase their commitment towards the integration of sustainability practices in the Setting and Infrastructure, Energy and Climate Change, Waste reduction/ recycling, Water conservation and Transportation system of the university and in the curriculum, research and engagement activities of the university. This is because sustainability as the triple bottom line of economic profitability, respect for the environment, and social responsibility will be unsustainable if one dimension overwhelms the others, the outcome will be unbalanced and unsustainable (Rogers *et al.,* 2008). So to get sustainable results a fine balance must be reached between the three components of sustainability. This is why the studied universities should attain a fine balance between the three components of sustainability. For this is only the way, they can fully be regarded as sustainable universities that are working towards a sustainable society. So, from the findings in this research, the studied universities have not been able to meet up with the critical role they have in creating the new generation concerned with sustainability.

While this research observed the integration of sustainability practices based on the assessment of UI GreenMetric sustainable ranking index, the website contents and sustainability annual reports of universities using the CORE system, the perceptions of their stakeholders about these sustainability practices were not measured. This is important, because the practices might not meet the stakeholders' expectations or even create a negative impression that the studied universities are just doing this simply for the sake of promoting themselves rather than as a commitment towards sustainability. Future studies can look into the effect of these practices on stakeholders' perception and loyalty on the universities.

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10

Prospective Classroom Teachers' Perceived Competencies on Sustainable Education

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Abstract

The purpose of this study was to analyze prospective classroom teachers' attitudes toward sustainability and their perceived competencies on Sustainable Education. For this purpose, first, the attitudes of prospective classroom teachers towards Sustainable Development were examined; then, their perceived competencies on Sustainable Education were investigated through a survey design. The participants consisted of 202 senior pre-service classroom teachers in 5 universities across Turkey. The data was collected through a tool designed by the researcher. To analyze the data, descriptive statistics and inferential statistics were used. The results of descriptive statistical analyses revealed that prospective classroom teachers had positive attitudes towards environmental, economic and cultural aspects of Sustainable Development. Inferential analyses demonstrated that the university they attend affected prospective classroom teachers' attitudes towards Sustainable Development and their competencies of knowledge and systems thinking on Sustainable Education. Their fathers' education level also affected their competency of values on Sustainable Education.

Key words: Sustainable development, Sustainable education, Teacher competencies

Introduction

Globalisation has produced new challenges both for the environment and humanity in addition to its advantages. In terms of ecologic aspects, people needed to work on solutions to global warming. Also, as a result of unequal distribution of resources, they needed to fight against poverty and famine. In order to prevent humanity from these problems, the concept of sustainable development has been discovered. In 1982, the General Assembly of the United Nations organized a commission called "The World Commission on Environment and Development" or "Bruntland Commission", and in 1987, they published a report entitled "Our Common Future". In the report, the concept of sustainable development has been described as "a development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development [WCED], 1987). By focusing on environmental protection and economic and social development, sustainable development also "requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life" (WCED, 1987).

The importance of sustainable development has been emphasized all through the world via world commissions and conferences. In 1992, in Rio de Janeiro, The United Nations Conference on Environment and Development (UNCED) published a global plan for action for sustainable development, known as the Agenda 21-Earth Summit- about the "international agreements on climate change and biodiversity" (Kates, Parris & Leiserowitz, 2005,

p.10). It focused on the development of societies and economies bringing together the environmental, economic and social concerns in a policy. In 2002, at the World Summit on Sustainable Development in Johannesburg, South Africa, leaders from government and non-governmental organizations, representatives of business and industry tried to "bring the world together" to take action on sustainable development (Johannesburg Summit 2002, 2002, p.1). Then, the UN General Assembly announced the period of 2005 – 2014 as the Decade of Education for Sustainable Development for this aim (United Nations Decade of Education for Sustainable Development [UNDESD], 2006). The United Nations Conference on Sustainable development also expressed their vision as eradicating poverty; maintaining sustainable development by integrating economic, social and environmental aspects; and creating greater opportunities for all (United Nations Sustainable Development Knowledge Platform, 2012).

On the other hand, in order to fulfil the requirements of sustainable development, the concept of Sustainable Education has also been introduced. It is defined as "learning to respect, value and preserve the achievements of the past; ... live in a world where all people have sufficient food for a healthy and productive life; ... [and] be caring citizens who exercise their rights and responsibilities locally, nationally and globally" (UNDESD, 2006, p.1). It is also described by the UN General Assembly as integrating the values of sustainable development to all aspects of learning by changing the behaviours to provide a sustainable and just society for all (UNDESD, 2006).

With the increasing importance of sustainable education, teacher education is also required to be re-oriented. For the inclusion of sustainable education in curricula from pre-school to adult education, the CSCT (Curriculum, Sustainable Development, Competences, Teacher training) Project was developed at the request of the UNECE (United Nations Economic Commissions for Europe). The aim of the project was to provide curriculum models integrated with sustainable education to teacher training institutes (UNECE, 2008 p.30). In the model, five domains of competencies were also presented as knowledge, systems thinking, emotions, values and ethics, and action. Then, in each domain, the competencies that teachers should have for education for sustainable development were listed. The domain of knowledge included the competencies related to mastering the key concepts of sustainable development. In the domain of systems-thinking, the competencies were described as thinking in systems and accepting schools as one part of the system. The domain of emotions included the competencies that required being aware of the importance of emotions. In the domain of values and ethics, the competencies focused on clarifying the beliefs and values for a just society. Lastly, the action domain focused on experiencing change for the competencies in each domain. In this study, this model was used for the development of the scale for teacher competencies.

Literature Review

In research studies, the concept of sustainable education has been analyzed from both teacher and student perspectives. Also, there are some studies conducted on teacher competencies. For the perceptions of teachers about sustainable education, Burmeister and Eilks (2013) studied the understanding of sustainability and sustainable education among German student teachers and trainee teachers of chemistry. In their study, it was found that both groups had positive attitudes towards sustainable education. Birdsall (2014) conducted a study to explore New Zealand student teachers' understandings of sustainability and self-awareness of their understandings. His study revealed that student teachers had a simplistic understanding of sustainability as they only focused on the environmental aspect of it. Also, Kagawa (2007) conducted a study to explore the students' perceptions and understandings of, and attitudes towards, sustainable development in the University of Plymouth. The findings of the study indicated that the majority of the students had positive attitudes towards sustainability and the students strongly associated the concepts of sustainable development with the environmental aspects not with the economical and social aspects. Moreover, Borg, Gericke, Höglund and Bergman (2014), Nikel (2017), Jones, Trier and Richards (2008), and Jaspar (2008) studied sustainable development from teachers' perpectives. In Turkey, Tuncer, Tekkaya and Sungur (2006), Keleş (2007), Kılınç and Aydın (2013), and Sağdıç and Şahin (2015)'s studies also focused on sustainable development from teachers' perspectives.

There are also some studies about students' perspectives on sustainable development. Sharma and Kelly (2014), Kagawa (2007), Olsson and Gericke (2016), Leeuw, Valois, and Seixas (2014) studied on sustainable development in terms of students' point of view. In Turkey, Kaya (2013), Öztürk, Olgan and Güler (2012), and Şahin, Ertepınar and Teksöz (2009) conducted research on sustainable development focusing on students' understandings.

On the other hand, the studies of Varga, Kozso, Mayer and Sleurs (2007), Mischo (2015), Barth, Godemann, Rieckmann and Stoltenberg (2007), Lasen, Tomas and Hill (2015), and Sims and Falkenberg (2013) focused on teacher competencies for sustainable education.

In their study, Varga, Kòzsò, Mayer and Sleurs (2007) studied developing teacher competencies for sustainable education in terms of the Environment and School Initiatives (ENSI) approach. They presented two examples from ENSI activities. The first one is one year action research based training course for pre-service teacher education. The second one is an analysis of a sequence of project supporting workshop for in service teacher education. Also, they presented a future step for teacher competences as self-reflection at an individual and school level.

Mischo (2015) studied early childhood teachers' perceived competence during transition from teacher education to work as a longitudinal study. Teachers' perceived competencies were assessed through a questionnaire. As a result of factor analysis, two factors were found as child-related competences and environment-related competences. Significant increase in both competence factors towards the end of teacher education and a decrease in child-related competences were found when teachers started to work in a kindergarten after graduation. The level of teacher education did not have effect on the competences.

Barth, Godemann, Rieckmann and Stoltenberg (2007) conducted a study on developing key competencies for sustainable development in higher education. The results of their study revealed that both formal and informal learning settings were of great importance. For that reason, a culture of teaching for sustainability should combine both formal and informal settings including competencies developed in extra-curricular settings. Lasen, Tomas and Hill (2015) conducted a document analysis in their studies and they suggested service-learning as a pedagogical approach to develop their competencies of pre-service teachers in an Australian teacher education.

Lastly, Sims and Falkenberg (2013) studied on developing competencies for education for sustainable development in undergraduate and graduate teacher education programs at Canadian universities. The results revealed how identified initiatives relate to the development of core ESD competences for educators as established by UNECE (2012). The results of their study suggested experiential, inter-disciplinary and inter-institutional learning, and building partnerships with colleagues, students, and community organizations.

When the studies conducted in the world were analyzed, it could be seen that the effects of different demographic variables such as age differences, gender differences, school climate and subject matter differences were examined through the studies as well. They were generally conducted on chemistry, geography and science courses. The results primarily emphasized the fact that teachers and students had positive attitudes towards sustainable development. Also, it was highlighted in the studies that the concept of sustainable development was new to students and teachers, and there was a necessity for training toward sustainable development. In addition, the competency studies generally offered models for the development of teacher competencies.

This study will be helpful in presenting the attitudes of the pre-service classroom teachers towards different aspects of sustainable development. In that way, their attitudes might be taken into consideration for the construction of the goals of sustainable education. It will also be helpful in portraying pre-service teachers' having the proposed competencies for the development of teacher education curricula.

For these aims, the following research questions are determined:

1. What are the prospective classroom teachers' attitudes towards sustainable development?

    1.1.Are there significant differences in their attitudes towards sustainable development with respect to their universities and their fathers' and mothers' education level?

2. How competent do prospective classroom teachers perceive themselves regarding Sustainable Education with regards to the competence areas of (a) knowledge, (b) systems-thinking, (c) emotions and (d) values-ethics?

    2.1.Are there significant differences in their perspectives with respect to their universities and their fathers' and mothers' education level?

Methodology

This study is a quantitative research and survey is used to examine pre-service classroom teachers' attitudes towards sustainable development and their perceptions regarding their competencies on sustainable education.

Limitations of the Study

The study was limited to the attitudes and perceived competencies of pre-service classroom teachers in 5 state universities in Turkey. It was also limited to the data that was collected in 2014-2015 academic year from 202 senior university students.

The study was also limited to the perspectives of pre-service classroom teachers to evaluate their own competencies about education for sustainable development. It was limited to their reported competencies of knowledge, emotions, systems thinking, and values and ethics.

Sample and Data Collection

Population of the study included all the fourth grade students enrolled in the department of classroom teaching in the state universities in Turkey. Sample of the study was selected through convenient sampling on a basis of the accessibility of the universities. Trakya (n=51), Marmara (n=48), Gazi (n=14), Kocaeli (n=47) and Uşak (n=42) Universities with 202 senior classroom teaching students constituted the sample.

The data were collected by a data collection instrument prepared by the researcher. It included three parts. In the first part, there were some questions related to demographic information about the participants. The second part included a scale related to the attitudes of pre-service classroom teachers towards sustainable development. The third part was related to the perceived competencies of the pre-service classroom teachers. The second and third part based on a five point scale ranging from Strongly Agree (5) to Strongly Disagree (1).

For the construction of the instrument, the following steps were taken: First, the literature on sustainability and education for sustainable development was reviewed (UNESCO, 2013; Mastrandrea & Santini, *2012*). Also, main themes from the goals of sustainable development were studied to determine the attitude statements to be included in the scale (United Nations, 2015). In addition, some questionnaires about the attitudes towards sustainable development were analyzed and some items were adapted from the items in Kagawa's (2007) study on sustainable development.

Lastly, in the third part of the instrument, for the construction of the second scale the literature on education for sustainable development and teacher competencies were reviewed. In the literature, especially, the "Dynamic model for ESD competences in teacher education" by the CSCT project (UNECE, 2008) was analyzed for the determination of the competencies. The model presented five domains of competencies as knowledge, systems thinking, emotions, ethics and values and action. For the scale, four domains of competencies were selected. The domain of action was decided not to be included in the scale, because all the other four competencies include its own action domain. Then, some of the competencies of each domain were selected and translated into Turkish.

Validity of the Research

The data of the study were collected by a data collection tool which was developed by the researcher. For the construction of the instrument, first, the literature on sustainability and sustainable education was reviewed. For the demographic questions, the questions about their gender, age, university and department, and the level of their fathers' and mothers' education were asked.

For the second part of the instrument, first, the literature on sustainability and sustainable education was reviewed (UNESCO, 2013; Mastrandrea & Santini, *2012*). In addition, some questionnaires about the attitudes towards sustainable development were analyzed and some items were adapted from the items in Kagawa's (2007) study on dissonance on students' perceptions of sustainable development and sustainability.

In addition, in the third part of the instrument, the "Dynamic model for ESD competences in teacher education" by the CSCT project (UNECE, 2008) was analyzed for the determination of the competencies. Then, some of the competencies of each domain were selected and translated into Turkish.

Later, the instrument was sent to seven experts from different fields of study such as curriculum and instruction, secondary science and mathematics education, computer education, classroom teaching, preschool teaching, and measurement & evaluation, and statistics. They were asked to express their opinion in terms of the instrument's being suitable for the purpose of the study, its clarity and content, easiness to answer, length, and its scaling. As a result, some of the items were rewritten, some of them were combined and some of them were eliminated.

Then, for the validity of the study, factor analysis was also run. As for the sampling adequacy, Kaiser Meyer Olkin (KMO) analyses were conducted. The values of .60 and above are required for good sampling adequacy (Tabachnick & Fidell, 2001). For the scale related to the attitudes, sampling size was appropriate as KMO=.61. For the factor analysis, common factor analysis, principle axis factor extraction method and oblimin rotation was used.

Table 1. Factor Loadings for Teachers' Attitudes

Item number	Factor Loadings		
	Factor 1	Factor 2	Factor 3
Item1	.40		
Item3	.41		
Item8	.46		
Item9	.51		
Item 10		.76	
Item 12		.41	
Item 13		.67	
Item 19			.77
Item 20			.86
Item 21			.39

To determine the factor structure of the attitudes scale, the eigenvalue results, scree plot and factor loadings were examined (Table 1). There were three factors which had eigenvalues greater than 1.00 (Table 2). After the rotation, these three factors accounted for a total of 38.37 % of the total variance.

Table 2. Eigenvalue, Percentages of Variance and Cumulative Percentages for Factors of Teachers' Attitudes

Factor	Eigenvalues	% of Variance	Cumulative %
1	2.38	18.46	18.46
2	1.61	10.96	29.42
3	1.50	8.96	38.37

In terms of reliability; internal consistency was examined through Cronbach's Alpha for each of the three factors. The reliability test for the first factor "cultural" is .73, for the second factor "economic" is .60 and for the third factor "environmental" is .72 (Table 3).

Table 3. Reliability Analysis of Teacher Attitudes

	Cronbach's Alpha	Number of Items
Environmental	.72	4
Economic	.60	3
Cultural	.73	3

For the scale related to competencies, sampling size was appropriate as KMO=.81. According to the literature, four factors were fixed. For the factor analysis, common factor analysis, principle axis factor extraction method and oblimin rotation was used.

Table 4. Factor Loadings for Teachers' Competencies

Item number	Factor Loadings			
	Factor 1	Factor 2	Factor 3	Factor 4
Item10	.95			
Item9	.58			
Item8	.54			
Item 4		.99		
Item 5		.76		
Item 2		.44		
Item 19				.97
Item 20				.67
Item 18				.56
Item 13				.62
Item 28				.52
Item 14				.45

To determine the factor structure of the attitude scale, the eigenvalue results, scree plot and factor loadings were examined (Table 4). As it can be seen from Table 5, after the rotation, these four factors accounted for a total of 58.74 % of the total variance.

Table 5. Eigenvalue, Percentages of Variance and Cumulative Percentages for Factors of Teachers' Competencies

Factor	Eigenvalues	% of Variance	Cumulative %
1	4.46	33.69	33.69
2	2.28	16.26	49.96
3	1.03	5.86	55.82
4	.751	2.92	58.74

In terms of reliability; internal consistency was examined through Cronbach's Alpha for each of the four factors. The reliability test for the first factor "values&ethics" is .80, for the second factor "knowledge" is .79, for the third factor "emotions" is .79 and for the fourth factor "systems thinking" is .72 (Table 6).

Table 6. Reliability Analysis of Teacher Competencies

	Cronbach's Alpha	Number of Items
Values&ethics	.80	3
Knowledge	.79	3
Emotions	.79	3
Systems Thinking	.72	3

Results

In this part, the findings related to the research questions were presented.

Pre-Service Classroom Teachers' Attitudes towards Sustainable Development

This section provides the results of the first research question which examined the pre-service classroom teachers' attitudes towards sustainable development. After the factor analysis, dimensions of their attitudes were defined as "cultural", "economic" and "environmental". Therefore, results related to their attitudes were presented based on these three factors. The results were presented as means and standard deviations (Table 7).

Table 7. Mean and Standard Deviations of the Attitudes of Teachers

Attitudes	M	Sd
Environmental	4.11	.62
Cultural	3.84	1.0
Economic	3.40	.64

The overall results indicated that pre-service classroom teachers' attitudes towards sustainable development were positive *(M = 3.70, SD = .52, N = 202)* as they were asked to rate their attitudes on a five point scale ranging from Strongly Agree (5) to Strongly Disagree (1). Furthermore, when the three dimensions were examined, the findings indicated that teachers' attitudes towards "cultural" factor (*M = 3.84, SD = 1.0, N = 202*), "economic" factor *(M = 3.40, SD = .64, N = 202) a*nd "environmental" factor of sustainable development (*M = 4.11, SD = .62, N = 202*) were rated as positive.

Pre-Service Classroom Teachers' Attitudes towards Sustainable Development regarding Environmental Factors

When pre-service classroom teachers' attitudes towards sustainable development were analyzed in terms of environmental factor (Table 8), it was seen that overall, their attitudes were positive (*M=4.11*).

Table 8. Environmental Factors of Sustainable Development

Items			%			M	Sd	n
	SD	D	NA/ND	A	SA			
1. I think that global warming is an important threat to our health.	1.0	1.0	5.9	34.7	57.4	4.47	.74	202
3. I think that the use of public transportation should be encouraged to protect the environment.	4.0	7.9	14.4	40.1	33.7	3.92	1.07	202
8. I think that in order to support the prevention of global warming as little energy as possible should be used.	1.5	6.4	18.8	41.6	31.7	3.96	.95	202
13. I think countries should use their own products instead of imported ones.	4.0	3.5	11.9	38.1	42.6	4.12	1.02	202

Most of the participants strongly agree that global warming is an important threat to our health (%57.4). Also, most of them agree that the use of public transportation should be encouraged to protect the environment (%40.1). %41.6 of the participants agree that in order to support the prevention of global warming as little energy as possible should be used. %42.6 of them also strongly agrees that countries should use their own products instead of imported ones.

Pre-Service Classroom Teachers' Attitudes towards Sustainable Development regarding Cultural Factors

When pre-service classroom teachers' attitudes towards sustainable development were analyzed in terms of cultural factor (Table 9), it was seen that overall, their attitudes were positive (*M=4.84*). %35.1 of the participants strongly agrees and that men and women are equal in all aspects of society. Also, most of the participants strongly agree that all people are equal in the world (%41.3). %47 of them also strongly agrees that the coexistence of different cultures supports social wealth.

Table 9. Cultural Factors of Sustainable Development

Items			%			M	Sd	n
	SD	D	NA/ND	A	SA			
19. I think men and women are equal in all aspects of society.	8.9	13.9	21.8	20.3	35.1	3.59	1.33	202
20. I think that all people are equal in the world.	15.8	8.4	10.4	24.3	41.1	3.66	1.47	202
21. I am aware that the coexistence of different cultures supports social wealth.	1.5	2.5	10.9	38.1	47.0	4.27	.86	202

SD=Strongly Disagree; D=Disagree; NA/ND= Neither agree nor disagree; A=Agree; SA=Strongly Agree

Pre-Service Classroom Teachers' Attitudes towards Sustainable Development regarding Economic Factors

When pre-service classroom teachers' attitudes towards sustainable development were analyzed in terms of economic factor (Table 10), it was seen that overall, they have positive attitudes. (*M=3.40*).

Table 10. Economic Factors of Sustainable Development

Items			%			M	Sd	n
	SD	D	NA/ND	A	SA			
9. I think that the economic development of our country is more important than environmental protection.	8.4	12.9	13.4	38.1	27.2	3.63	1.24	202
10. I believe that Turkey needs economic development primarily to protect the environment.	11.4	21.8	33.2	24.3	9.4	2.99	1.14	202
12. I think that poverty should be reduced primarily for sustainable development.	3.0	8.9	31.7	39.6	16.8	3.58	.97	202

Most of the participants agree that the economic development of our country is more important than environmental protection (%38.1). Also, most of them are not sure that Turkey needs economic development primarily to protect the environment (%33.2). Most of the participants agree that poverty should be reduced primarily for sustainable development (%39.6).

Pre-Service Classroom Teachers' Attitudes towards Sustainable Development in relation to their University and Parent Education

The results revealed that the university prospective teachers attend had statistically significant effect on their attitudes towards economic factor "$F_{(4,162)} =5.80$, $p=.000$", but it did not have any statistically significant effect on their attitudes towards cultural and environmental factors of sustainable development.

However, the education level of their fathers (Pillai's trace = .07, $F_{(9,486)}$= 1.33, p>.05) and mothers (Pillai's trace = .08, $F_{(9,486)}$= 1.45, p>.05) did not have statistically significant effect on pre-service classroom teachers' attitudes towards sustainable development with respect to "environmental", socio-economic" and "cultural " factors.

Teachers' Perceived Level of Competency on Sustainable Education

The second research question of the study was related to prospective teachers' perceived competencies on sustainable education. After the factor analysis, factors of their competences were defined as "emotions", "knowledge", "values and ethics" and "systems-thinking". Therefore, results on competencies were also presented under these four factors.

When the teachers' competencies were analyzed in Table 11, the overall results indicated that the pre-service classroom teachers almost agree that they can fulfil the requirements of sustainable education (*M= 3.93, SD=.50, n=202*).

Table 11. Mean and Standard Deviations of the Competencies of Teachers

Competency	*M*	*Sd*
Emotions	4.38	.59
Values	4.23	.66
Systems-thinking	3.95	.67
Knowledge	3.15	.86

The pre-service classroom teachers perceived themselves more competent in the area of emotions compared with the others *(M=4.38)*. Then, they felt competent in terms of values (*M=4.23*), systems-thinking (*M=3.95*) and knowledge (*M=3.15*) respectively.

Teachers' Perceived Level of Competency in Values & Ethics

As Table 12 demonstrates, most of the participants agree that they can encourage their students to determine a stance in the face of events (*M=4.32*). Also, most of them can model values of respect, equality, justice, dignity and respect for all which underpin sustainable development (*M=4.20*). Moreover, mostly, the prospective teachers agree that they can encourage their students to use and protect their own resources both for the present and new generations (*M=4.03*).

Table 12. Competency in Values& Ethics

Items	%					*M*	*Sd*	*n*
	SD	D	NA/ND	A	SA			
8. I can encourage my students to determine a stance in the face of events.	.5	1.5	8.9	44.1	45.0	4.32	.74	202
9. I can model values of respect, equality, justice, dignity and respect for all which underpin sustainable development.	2.0	1.5	11.4	46.0	46.0	4.20	.84	202
10. I can encourage my students to use and protect their own resources both for the present and new generations.	1.0	2.0	9.9	50.5	36.6	4.20	.77	202

SD=Strongly Disagree; D=Disagree; NA/ND= Neither agree nor disagree; A=Agree; SA=Strongly Agree

Teachers' Perceived Level of Competency in Knowledge

As Table 13 demonstrates, almost half of the participants agree that they know the role of cultural, socio-economic and political systems in decision making. (*M=3.19*). Also, they think that they can select educational goals for ESD, taking into account the developmental stage and the prior knowledge of the students, and the diversity within the group of learners (*M=3.09*). In addition, half of the prospective teachers agree that they can encourage their students to use and protect their own resources both for the present and new generations (*M=3.15*).

Table 13. Competency in Knowledge

Items	%					M	Sd	n
	SD	D	NA/ND	A	SA			
2. I know the role of cultural, socio-economic and political systems in decision making.	5.0	18.3	37.6	30.7	8.04	3.19	.99	202
4. I can select educational goals for ESD, taking into account the developmental stage and the prior knowledge of the students, and the diversity within the group of learners.	5.0	23.3	40.1	19.8	11.4	3.09	1.04	202
5. I can create an effective learning environment for teaching SD issues.	4.0	22.8	39.1	22.8	11.4	3.15	1.03	202

Teachers' Perceived Level of Competency in Emotions

As Table 14 demonstrates, most of the participants agree that they pay attention to covering the issues related to social equality in class and school activities. (*M=4.20*). Also, most of them think that they appreciate the differences for a just society (*M=4.41*). In addition, half of the prospective teachers agree that they can appreciate the feelings of their students. (*M=4.52*).

Table 14. Competency in Emotions

Items	%					M	Sd	n
	SD	D	NA/ND	A	SA			
18. I pay attention to covering the issues related to social equality in class and school activities.	.5	15.3	9.9	33.5	34.7	4.20	.72	202
19. I appreciate the differences for a just society.	0.0	2.0	7.4	38.1	52.5	4.41	.72	202
20. I appreciate the feelings of my students.	1.0	0.5	4.0	35.1	59.4	4.52	.69	202

Teachers' Perceived Level of Competency in Systems Thinking

As Table 15 demonstrates, most of the participants agree that they would benefit from the existing local, national and international resources about ESD. (*M=3.75*). Also, most of them think that they are schools' being a part of local, national and global systems. (*M=4.11*). In addition, mostly, they think that they can prepare activities to encourage critical thinking skills in their classes (*M=3.97*).

Table 15. Competency in Systems thinking

Items	%					M	Sd	n
	SD	D	NA/ND	A	SA			
13. I would benefit from the existing local, national and international resources about ESD.	1.0	6.9	27.7	44.6	19.8	3.75	.89	202
14. I am aware that schools are a part of local, national and global systems.	1.0	3.0	12.9	50.0	33.2	4.11	.81	202
28. I can prepare activities to encourage critical thinking skills in my classes.	0.5	3.0	22.8	46.5	27.2	3.97	.82	202

Teachers' Perceived Level of Competency regarding Sustainable Education in relation to their Universities and Parent Education

Results revealed that the university prospective teachers attend had statistically significant effect on their competencies regarding knowledge "F (3, 162)=8.98, p=.000", and systems thinking "F(3,162)=4.21, p=.003" (Table 16). However, the university did not have any statistically significant effect on their competencies regarding emotions and values and ethics.

Table 16. Teachers' Competencies in relation to their Universities and Father Education

Source	Dependent Variable	SS	df	MS	F
university	emotions	1.162	4	.290	.891
	knowledge	21.571	4	5.393	8.981*
	values and ethics	2.574	4	.644	1.656
	systems-thinking	7.395	4	1.849	4.210*
father education	emotions	.356	3	.119	.364
	knowledge	4.199	3	1.400	2.331
	values and ethics	4.106	3	1.369	3.523*
	systems-thinking	1.435	3	.478	1.090
Error	emotions	52.780	162	.326	
	knowledge	97.271	162	.600	
	values and ethics	71.135	162	.389	
	systems-thinking	434.670	162	.439	
Total	emotions	3939.111	202		
	knowledge	2146.667	202		
	values and ethics	3710.222	202		
	systems-thinking	3234.778	202		

The education level of their fathers had statistically significant effect on pre-service classroom teachers' competencies on sustainable education. "Pillai's trace = .13, F (12,483)= 1.85, p=.04". The effect of the education level of their fathers on each dependent variable was examined. Results showed that the education level of their fathers had statistically significant effect on their competencies regarding values and ethics "F(3,162)=3.52, p=.016".

On the other hand, the education level of their mothers did not have statistically significant effect on pre-service classroom teachers' competencies "Pillai's trace = .098, F(12,483)= 1.4, p>.05".

Findings

This study aimed to analyze prospective classroom teachers' attitudes toward sustainability and their perceived competencies on Sustainable Education. The results of the study related to examining the attitudes of pre-service classroom teachers towards sustainable development indicated that pre-service classroom teachers had positive attitudes towards sustainable development. As the studies of Corney (2006); McKeown, (2002); and Summers, Childs, and Corney (2005) also supported there are three dimensions of sustainable development. The findings of this study indicated that teachers had positive attitudes towards the environmental and cultural aspects of sustainable development. However, their attitudes towards economic aspects of sustainable development were less positive than the environmental and cultural aspects. The reason may be related to their understanding of sustainable development. As Kagawa (2007) emphasized in his study, the concept of sustainable development is predominantly associated with environmental aspects; and social and economic dimensions of sustainability were less represented. This can also be because of its being more emphasized environmentally throughout the world. Similarly, the findings of Birdsall (2014)'s study revealed that student teachers had a simplistic understanding of sustainability focusing only on the environmental aspect of sustainability. Moreover, in parallel with the other studies about the attitudes towards sustainable development (e.g. Alkış & Öztürk, 2007; Summers, Corney, & Childs, 2004); Tuncer, Tekkaya, & Sungur (2006) also found that student teachers mainly focused on the environmental aspects of sustainability. For that reason, there is a need to emphasize the other dimensions of sustainable development at education faculties.

In addition to the descriptive findings on attitudes, the differences in pre-service classroom teachers' attitudes with respect to their universities and their parents' education level were examined. The results indicated that pre-service classroom teachers' attitudes towards sustainable development especially on economic aspects change according to the university they attend. The reason may be related to their understanding of sustainable development. As the other studies also suggested, environmental aspects of sustainable development are highly emphasized. However, the emphasis on the economic aspects of it may change according to the curriculum of the universities. For that reason, universities need to include all aspects of sustainable development in their curricula. In terms of the effects of their parents' education level, the results of the study indicated that the education level of pre-service classroom teachers' fathers and mothers did not have statistically significant effect on their attitudes towards sustainable development with respect to "environmental", economic" and "cultural" factors. The reason might be related to their education. As the curriculum at their universities provides them with some knowledge of sustainable education and provides learning opportunities to understand it, it is possible that their parents' education level do not affect their attitudes towards sustainability.

On the other hand, in this study, the pre-service classroom teachers' perspectives were analyzed in the competence areas of emotions, values-ethics, systems-thinking and knowledge. The pre-service classroom teachers perceived themselves more competent in the area of emotions compared to the areas of values and ethics, systems-thinking, and knowledge respectively. This indicates that prospective teachers might not be sure about their content knowledge about sustainable education. Therefore, it could be difficult for them to have systematic thinking. However, they may find themselves competent in the areas of emotions and values and ethics intuitively. Bertschy, Künzli and Lehman (2013) also emphasized that institutions of teacher education should help teachers develop competencies that are specified according to the specific goals of sustainable development. In that way, first, the competencies would be given in knowledge level specifically and it would also be easier to think in systems for sustainable education. Also, with the help of competencies of emotions and values and ethics, they would perceive themselves completely competent on sustainable education.

As a result, the competencies of pre-service classroom teachers regarding sustainable education should be developed more in their departments. Although they feel competent in emotions and values and ethics, their competencies of knowledge and systems thinking are also needed to be supported by clearly specified objectives and interdisciplinary learning environments.

The results about the pre-service classroom teachers' perceived level of competency on sustainable education by the universities they attend revealed that the universities they attend had statistically significant effect on pre-service classroom teachers' perceptions of competence on sustainable education with respect to knowledge and systems thinking. The reason might be that the content of curriculum of classroom teaching is expected to have an effect on

the competencies of knowledge and systems thinking of prospective teachers. For that reason, universities need to design interdisciplinary courses focusing especially on the main themes of sustainable education to provide the basic knowledge on sustainable development. In that way, they are also expected to develop systems thinking skills of their students.

On the other hand, the results of the study indicated that the education level of pre-service classroom teachers' fathers have statistically significant effect on their perceptions of competence on sustainable education with respect to values & ethics. Therefore, the role of families in education should never be underestimated. For sustainable education, families should also be educated.

Conclusion

The results of this study might be used for the development of positive teacher attitudes towards sustainability at universities and for the improvement of teacher competencies for sustainable education. Also, this study will be helpful in determining teacher competencies on sustainable education by indicating the areas of competencies.

On the other hand, for further studies, qualitative research could also be conducted to get information about teacher attitudes towards sustainability and their perceived competencies for sustainable education through interviews, surveys or observations. In addition, the curriculum of the universities might be analyzed for sustainable education.

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11

Sustainable Supplier Evaluation and Selection Criteria

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Abstract

Supplier management is a critical activity for supply chain management and it has a great impact on the performance of organizations and supply chains. There are numerous researches and publications on supplier evaluation, selection and development. Besides traditional criteria, companies started to focus on greening and sustainability issues in supplier evaluation and selection. There are several factors that increase the sustainability awareness of companies in their supply chain operations: changing customer demands, pressures from other stakeholders and complying with environmental legislations and regulations by related international organizations. Three dimensions of sustainability; economic, environmental and social are regarded in order to retain the sustainability of supply chains. This study aims to explore the sustainability issues in supplier evaluation and selection and present sustainable supplier evaluation and selection criteria by reviewing the literature. Identified criteria are combined under different sub-headings with the insights gained by literature review and a focus group study. Then the frequencies of the criteria are discussed.

Keywords: Sustainability, Supplier management, Sustainable supplier selection and evaluation

Introduction

In recent years, sustainability has become a popular core topic in many business areas such as manufacturing, health, service, energy and agriculture etc. Sustainability is the development that meets the needs of the present, without negatively affecting the future generations to meet their own needs (WCED, 1987). As the climate change, resource dependency and transaction cost issues draw more and more attention, sustainability concept has become one of the most important topics of concern and research.

Increased globalization, public awareness and pressures from governments and stakeholders drive companies to consider greening and sustainability issues in their Supply Chain Management (SCM) operations. Besides traditional SCM, Sustainable Supply Chain Management (SSCM) take into account the three dimensions of sustainable development: economic, environmental and social. SSCM derived from increasing customer requirements, government regulations, and environmental legislations (Büyüközkan & Çifçi, 2011). One of the results of these issues is SSCM concept that achieves a higher efficiency in SCM by implementing the three dimensions of sustainability in their practices (Seuring *et al.*, 2008). For sustainable supplier evaluation and selection; environmental, social and economic characteristics of suppliers are necessary and important considerations (Sarkis & Dhavale, 2015).

In order to sustain the sustainability of the Supply Chain (SC) and establish successful business alliances, companies have to spread sustainability initiatives to other members in their SC, especially to suppliers. Suppliers have a great importance in creating Sustainable Supply Chains (SSC). SSCs are the supply chains that manage the economic, social and environmental impacts of their network to protect long-term profitability and value, and ensure the survival of the companies (UN Global Compact, 2010). Supplier evaluation and selection is one of the most critical and strategic success factors for SSC development. The goal of this process is to maximize the overall value in purchasing. Sustainable Supplier Selection (SSS) can affect the overall degree of sustainability in a SC (Amindoust *et al.*, 2012). Supplier selection and performance evaluation gains increasing attention especially with the increasing outsourcing trend and dependency on suppliers. Supplier selection depends on a myriad of factors such as price, quality, capacity etc. In recent years, companies started to consider greening and sustainability issues in their supplier evaluation and selection processes. Based on the triple bottom line, financial performance, environmental impacts and social responsibilities of suppliers are regarded in business operations. Different metrics are used to measure sustainability performance of suppliers in the business applications and research studies.

The aim of this paper is to make a literature review on the sustainable supplier evaluation and selection criteria. Searches are conducted in ScienceDirect, Emerald and SpringerLink electronic databases with "sustainable supplier selection" keyword. Sustainability approaches in supplier evaluation and selection are determined, SSS criteria in the determined articles are combined in different sub-categories and the frequencies of these categories are discussed. The paper is organized as follows. Section 2 describes the sustainable supplier evaluation and selection concept. Section 3 presents the SSS criteria in the literature. Conclusion part gives concluding remarks.

Sustainable Supply Chain Management and Supplier Selection

Sustainability concept is interdisciplinary in nature and has roots in different disciplines from natural sciences to psychology, sociology, anthropology and politics (Linton *et al.*, 2007). The academic studies on sustainability range over a wide area from operational to managerial (Linton *et al.,* 2007). The interest on sustainability concerns in SCM has increased in recent years. SC sustainability includes green practices, responsible sourcing and corporate social responsibility (World Bank, 2012). SSCM is an extension of green

SCM. Some of the application areas of sustainability in SCM are as follows; i) Designing eco-friendly products, ii) Use of cleaner production technologies, iii) Increasing the life of products, iv) The recovery of used products, v) Recycling, reuse and remanufacturing of materials after their usage period, vi) Waste management and pollution control, vii) Minimize processing and distribution costs, viii) Ethical behaviour, gender equity, and labor issues (Linton *et al.*, 2007; World Bank, 2012).

One of the most effective ways of increasing the sustainability of an organization is integrating the sustainability policy of an organization with the purchasing activities (Sarkis and Dhavale, 2015). Sustainability may be adopted in various processes of supply management such as; i) Requesting environmental and social policy development from key suppliers, ii) Incorporating sustainability performance requirements in supply and procurement contracts, iii) Adapting recognized environmental and social management systems such as ISO 14001- Environmental Management System, OHSAS 18001- Occupational Health and Safety Management System, ISO 45001 – A New Standard for Occupational Health and Safety Management Systems. iv) Requesting reports from suppliers about sustainability-related risks and their management (World Bank, 2012). These reports may include greenhouse gases, waste management, energy consumption etc.

SSS has a huge impact on firm's financial success (Er Kara & Oktay Fırat, 2016). Unfortunately, most of the data on the sustainability of suppliers depend on expert opinions and personal judgements. In addition, SSS criteria generally vary according to the corporate policy, industry and scale of the focal company.

Sancha *et al.* (2015) examined the impact of country-specific institutional pressures and firm specific capabilities on the adoption of sustainable supplier development practices. They listed three types of institutional drivers for sustainable supplier development: i) coercive drivers such as laws and regulations implemented by governments, ii) normative drivers including the pressures imposed by social groups such as trade unions and social media, and iii) mimetic drivers referring to imitating successful competitors.

Yousefi *et al.* (2016) evaluated and ranked sustainable suppliers using the scenario based model of robust data envelopment analysis which considers the stochastic data. The new approach of the authors creates a benchmark for both efficient and inefficient suppliers, alerts decision makers to take corrective actions for possible inefficient suppliers and enables future planning.

Sustainability Criteria in Selecting and Evaluating Suppliers

In today's global competitive environment, SCM is getting harder day by daywith the increasing complexity, dynamism and risks of SCs. SCM must be more agile and flexible to respond quickly to changing customer needs. This requires an effective management which conducted in cooperation with suppliers since the success and strength of the companies do not only depend on their own performance but depend on the performance of other stakeholders of the SC. SCM involves processes related to suppliers such as supplier evaluation, selection, development and supplier relationship management (Yurtsever and Oktay Fırat, 2013). SC processes starts with supplier selection and this process is a strategic decision for the company in terms of

supplier management. Working with the wrong suppliers leads to adverse effects for the firms such as increased costs, customer defection and prestige reduction (Luthra et al., 2016). Therefore, companies should give the necessary consideration to the selection and evaluation of the suppliers.

When selecting and evaluating the suppliers, companies consider criteria such as price and cost, quality, technological properties (e.g. technology level, machinery/equipment qualification, R&D activities), flexibility, geographical proximity and supplier reputation (Yurtsever & Oktay Fırat, 2013). Nowadays, there are pressures on companies to focus not only on economic criteria but also on environmental and social criteria as well. Environmental, social and economic perspectives are combined in sustainable development (Munasinghe, 1993).

Sustainable supplier evaluation and selection process requires determination of various objectives, sustainability criteria and reliable techniques. Although there is a vast amount of research on supplier selection, the literature on sustainable or green supplier evaluation and selection is not very rich. Companies need to incorporate sustainability aspect in their supplier selection processes. Sustainable supplier evaluation and selection includes economic, environmental and social supplier characteristics. Some of the factors and metrics used in measuring supplier sustainability are as follows (Orji & Wei, 2015):

i) Economic factors: quality, delivery, cost, price etc.

ii) Environmental factors: green design, environmental competencies, pollution control, waste management etc.

iii) Social factors: worker's safety, human rights, information disclosure etc.

Organizations have to incorporate traditional supplier selection criteria with these sustainability-related criteria.

Various others used fuzzy logic to measure the ambiguity (or vagueness) of human judgment in order to represent sustainability criteria. Büyüközkan and Çifçi (2011) focused on supplier evaluation with incomplete preferences and developed a novel fuzzy multi-criteria decision framework for sustainable supplier evaluation. Their evaluation model includes five main sustainability criteria; organization, financial performance, service quality, technology, and social responsibility & environmental competencies. Amindoust *et al.* (2012) introduced a fuzzy ranking model for supplier selection. They used fuzzy logic to handle with the subjectivity on the weights of supplier selection criteria and sub-criteria.

Orji and Wei (2015) analyzed the supplier behavior in the past, current and future time periods with respect to two sustainability criteria: green design and information disclosure. They proposed a hybrid model including fuzzy TOPSIS and system dynamic simulation modelling approach.

Sarkis and Dhavale (2015) selected and evaluated sustainable suppliers by taking a profit-people-planet approach which is called triple-bottom-line. They considered the suppliers' environmental impacts and social responsibilities besides their business operations. They developed a methodological approach based on Monte Carlo Markov Chain simulation and Bayesian theory to rank and select suppliers. They used nine measurements under three areas; for business operations: i) cost variance from expected, standard or contracted cost, ii) quality of the products or services purchased, iii) on-time order deliveries; for environmental concerns: iv) supplier's energy efficiency, v) penalties related to environmental violations, vi) use of environmental and pollution control technology; for social responsibility: vii) philanthropic contributions, viii) responsibility to the community, ix) employee turnover rate.

Luthra *et al.* (2016) proposed an integrated Analytical Hierarchy Process (AHP) and ViseKriterijumskaOptimizacija I KompromisnoResenje (VIKOR) approach to evaluate and select sustainable suppliers. They identified 22 sustainable supplier evaluation criteria through literature review and experts' opinions. According to the findings of a real world example in an automobile company, main dimensions of SSS are ranked according to their priority as; environment, economic and social dimensions. Additionally, top five SSS criteria are determined: environmental costs, product quality, product price, occupational health and safety systems and environmental competencies.

Azadnia *et al.* (2012) proposed an integrated approach of clustering and multi criteria decision making methods for SSS problem. They clustered suppliers based on customer demand and sustainability with self-organizing map. Then they ranked the supplier clusters with TOPSIS method. They determined the weights of criteria and sub-criteria for supplier selection by fuzzy AHP applied in a manufacturing company in automotive industry. The most important criteria are determined as environmental management system, occupational health and safety management systems and cost.

Xu *et al.* (2013) focused on the corporate social responsibility issues in supplier selection and considered seven corporate social responsibility criteria and their relevant sub-criteria. Using AHP, these criteria are ranked according to their weights as follows: organizational legal responsibilities, pollution, human rights issues, underage labor, long working hours, safeguarding mechanisms, and feminist labor issues.

In order to select the best sustainable suppliers, Azadi *et al.* (2014) developed and integrated data envelopment analysis in a fuzzy context. The authors presented a case study in a resin production company to show the efficiency of the proposed method for SSS problem. They used total cost of shipments, price and the number of shipments per month for the economic criteria, eco-design cost for the environmental criteria and cost of work safety and labor health for the social criteria as input in their empirical analysis.

Lee *et al.* (2009) proposed a model for evaluating green suppliers. They defined a hierarchy to evaluate the importance of the criteria for selection of green suppliers by using fuzzy AHP and fuzzy expanded AHP method. From the sustainability point of view they used 6 selection criteria: i) Quality, ii) Technology capability, iii) Pollution control, iv) Environmental management, v) Green product, vi) Green competencies.

Identification of criteria is very important for the effectiveness of supplier selection process. 12 journal articles are reviewed in the light of sustainability supplier selection criteria. These criteria are determined and combined under 8 sub-categories in each dimension of sustainability with the help of the insights gained from the literature review and a focus group study. Some of the sustainability criteria used in the reviewed articles are summarized in Table 1.

Table 1. Sustainability Criteria Used in the Reviewed Articles

Dimension	Category	Frequency	Büyüközkan and Çifçi, 2011	Orji and Wei, 2015	Sarkis and Dhavale, 2015	Luthra et al., 2016	Amindoust et al., 2012	Azadnia et al., 2012	Xu et al., 2013	Kuo et al.,2010	Keskin et al., 2010	Mafakheri et al., 2011	Lee., 2009	Erol et al., 2011
Economic	Production facilities and capacity	3	x				x						x	
	Cost/Price	9	x		x	x	x	x		x	x	x	x	
	Delivery Performance	8	x		x		x	x		x	x	x	x	
	Financial Capability and Performance	6	x				x				x	x	x	x
	Management Capability	6	x				x			x	x		x	x
	Manufacturing and Technological Capability	6	x				x			x	x		x	
	Quality	9	x		x	x	x	x		x	x	x	x	
	Service capability	5	x		x		x			x			x	
Environmental	Green Management Strategy	9	x		x	x	x			x	x	x	x	x
	Environmental costs	3			x		x					x		
	Environmental management system	7	x				x	x		x		x	x	x
	Green Design / Eco-Design	5		x			x	x		x		x		
	Pollution and waste management	4			x		x	x	x					
	Resource and energy consumption	3			x		x							x
	Reverse Logistic system	3					x			x				x
	Use of harmful / hazardous materials	4					x			x			x	x
Social	Human Resource Management	2			x									x
	Brand Image and Reputation	1												x
	Corporate social responsibility	6	x		x		x		x	x				x
	Health and Safety	5				x	x	x			x			x
	Human rights issues	4					x		x	x				x
	Information disclosure	5		x			x		x	x			x	
	Organizational legal responsibilities	1							x					
	Relationship with stakeholders	6	x				x	x		x			x	x

The percentage of the SSS dimension frequencies are; 43,3% economic sustainability, 31,7% environmental sustainability and 25,0% social sustainability as an extraction of Table 1. It can be seen that economic

dimension has a higher priority in the reviewed articles since almost half of the total frequencies of the SSS criteria is in the economic perspective.

Table 2. Sustainable Supplier Selection Indicators Used in the Articles

ECONOMIC DIMENSION	
Criteria	Indicator
Cost/Price	Product Price, Pay time, Cost of supplied components, Profitability of suppliers, Price increasing trend, Compliance with sectoral price behavior
Delivery Performance	On-time order deliveries, Lead time, Ability of packaging and transformation, Geographical location
Service capability	Flexibility, On-time response to requests, Responsiveness, Service quality
Management Capability	Organization and management, Attitudes of managers, Ability of managing diversification, Future strategy direction
Manufacturing and Technological Capability	R&D capability, Technology level, Information quality, Having technically adequate employee and equipment
Financial Capability and Performance	Financial position, Financial stability, Total sales, Past finance performance
Quality	quality of the products or services purchased, Quality-related certificates, The number of rejected item, Existing test capability, measurement and control apparatus
ENVIRONMENTAL DIMENSION	
Criteria	Indicator
Green Management Strategy	Effectiveness of supplier training in environmental issues, Environmental effects and preventive actions, Environmental competencies, Senior management support
Green Design / Eco-Design	Green R&D, Green product, Design for environment (recycle, reuse, disposal)
Resource and energy consumption	Resource consumption, supplier's energy efficiency, Annual water consumption, Fraction of facilities using renewable energy
Reverse Logistic system	Waste electrical and electronic equipment, Waste minimization (recycling rates), Effectiveness of reverse logistics system, Use of recycled materials
Use of harmful / hazardous materials	Fraction of facilities using HFC powered units, Ozone depleting chemicals, Restriction of hazardous substance
SOCIAL	
Criteria	Indicator
Human Resource Management	Effectiveness of discipline management, Effectiveness of performance management system, Effectiveness of personnel recruitment and selection, Average annual training time per employee, Annual personnel turnover
Corporate social responsibility	Responsibility to the community, Safeguarding mechanism in CSR, Fraction of total sales invested for social projects per year, Respect for the policy
Health and Safety	Occupational health and safety management systems, Applications of work safety and labor health, Annual number of recordable accidents per employee
Human rights issues	Underage labor, Long working hours, Feminist labor issue, The interests and rights of employee, Effectiveness of compensation management, Gender diversity
Relationship with stakeholders	The rights of stakeholders, Organization's openness to stakeholder involvement in decision making, relationship closeness and attitudes, Degree of strategic cooperation

In the reviewed articles, the most frequent criteria in the economic dimension are cost/price, quality and delivery performance whereas the less frequent is production facilities and capacity. In the environmental dimension, while the less frequent criteria are environmental cost, resource and energy consumption, reverse logistic system; green management strategy and environmental management system have the highest frequency. Corporate social responsibilities and relationship with stakeholders have the highest priority in the social dimension, whereas organizational legal responsibilities and brand image and reputation have the lowest frequency. Some of the indicators used in reviewed articles which are combined in determined categories are shown in Table 2.

In practical business life, the importance of the SSS criteria depend on the decision makers' preferences (Amindoust et al., 2012). It is very hard to evaluate suppliers from all the three aspects of sustainability, hence different decision makers with different backgrounds, expertise and experience in these issues may be used (Büyüközkan & Çifçi, 2011).

Conclusion

SSS has become a vital process in today's highly complex, global and competitive business environment. Companies should integrate criteria based on triple bottom line of sustainability for supplier evaluation and selection processes. The indicators that are used to measure the sustainability of suppliers are determined and combined under eight categories in three dimensions. The most common categories in economic dimension are cost/price, quality and delivery performance; in environmental dimension: green management strategy, environmental management system; in social dimension: corporate social responsibility and relationship with stakeholders.

One of the main results of this review is that; environmental and social criteria are used less than the economic criteria in the supplier evaluation and selection literature. Environmental and social dimensions include various qualitative and quantitative criteria. Qualitative criteria are generally measured with expert judgements. Availability and accessibility of data related with the sustainability of suppliers is an important topic that impacts the performance of supplier evaluation and selection problem. Supplier sustainability data generally depends on historical data or expert opinion (Sarkis & Dhavale, 2015).

AHP, DEA and TOPSIS methods are the most extensively used approaches in supplier evaluation and selection. In addition, the number of researches that incorporate fuzzy logic to analyse qualitative criteria is increasing.

There are several factors that increase the sustainability responsiveness of companies in their supplier selection process such as changing customer demands, pressures from other stakeholders and complying with government regulations and environmental legislations. From the social sustainability aspect, organizational legal responsibilities criteria has the lowest frequency in the reviewed articles. However, legislations are very important drivers for sustainability (Linton *et al.*, 2007). Although there are an increasing number of studies on the sustainability concept in supplier evaluation and selection, the number of empirical study in this area is

very few because of the difficulty in the identification of the sustainability related measures and data collection in this area. For further research the number of reviewed articles will be increased.

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12

A Sustainability Implementation Perspective for Environmental Accounting Information Systems in the Corporate Companies

Ayşe Ümit Gökdeniz

Abstract

The purpose of this study is to present a systematic approach for sustainability of environmental accounting practices in terms of strategic implications of the information systems in companies. First I argue that environmental accounting information systems have become a key component of environmental performance of corporate companies on the globe therefore urgently there is a need for an environmental accounting system to focus on controlling environmental costs towards global companies. Also we need a new perspective on knowledge-based environmental accounting applications. Moreover global economic crisis has been affected record level of global markets worldwide which is created most important challenges and hit companies globally. Secondly I encourage accountants to consider to use environmental accounting information systems for their accounting practices which provides valuable tools and contains various benefits. Third I drew attention for a global perspective towards the new environmental challenges. Finally, this paper suggests the role of information technology which is highly related to the corporate social responsibility as a part of company management policy.

Keywords: Environmental Accounting Information Systems, Corporate Companies, Sustainability

1. Introduction

Sustainability implementation perspective is very important issue in order to meet this goal and to be applicable for environmental accounting information systems (EAIS). The goal of sustainable development is to meet "the needs of the present without compromising the ability of the future generations to meet their own needs" as key forces society organizations of all kinds have an important role to play in achieving this goal. (Global Reporting Initiative, 2011). Environmental issues are concerned the crisis is often used as an excuse to limit environmental taxes, emission certificates and restrictions on the maximum emissions allowed by cars. Goals for climate change are also not the priority in people's minds. But in actual fact the crisis would be the ideal opportunity to push for energy-saving measures and to promote new technologies, both of which are crucial to combating medium term problems. (Aiginger, 2009). The aim of this study how environmental accounting information systems(AIS) can be applied to the corporate companies.

2. Methodology

The important purpose of this study addressed and will be focused on environmental accounting information systems.I used as a research methods a more efficient way of explaining different perspectiveare thought to be beneficial, especially in the study has been given The methodology of this study has been planned as The books-related Fields articles applications,web sources, main sources,reports,working papers.

2.1 . Literature Review

An important study by (Gray, 2010). The emergence of sustainable development as the complex notion through which social and environmental issues must be addressed whether at policy, personal or organization all levels has had a growing influence in the accounting literature. According (Jones, J, Michael.2010). The traditional accounting paradigm with its narrow focus on accounting numbers does not capture the environmental consequences of organisational activity. The other study by (Hyršlová, Hájek, 2006) Economic consequences of influence of the company on the environment are recorded in the accounting system of the company. Another study by (Löfsten & Lindelöf, 2005) The environment is a term used to explain a number of factors and relevant factors of a firm's environment which affect the design of the management accounting system and include the importance of R&D, technology and innovation. In this study (Bartelmus, 1999) Environmental source and sink functions of natural resource supply and waste absorption are impaired by economic activities, with repercussions on these very same activities and human well-being with, or prevents, the operation of other functions.

In the (U.N.2000) Environmental problems arise when the use of the environment for one set of functions interferes. The interesting study by (Swanson,2006) Environmental accounting and the systems sciences are parallel developments of the past half-century.(E.E.A,2011) Ecosystem accounts are being developed as part of the System of Environmental-Economic Accounts (SEEA)which aims at supplementing the UN System of National Accounts with information on the environment and natural capital. According to (Boyd, James,

1998) Environmental accounting" is more than accounting for environmental benefits and costs. It is accounting for any costs and benefits that arise from changes to a firm's products or processes, where the change also involves a change in environmental impacts.

2.1.1 Findings and Evaluations

Findings of this study has determied a perspective on environmental accounting information systems which are quite compact and complex.Search companies do not fully implement environmental accounting systems except large scale enterprises.environmental issues are getting to be global matter.

3. The Costing Stages in Environmental Accounting Sustainability

To successfully reduce corporate environmental impacts, management not only needs to develop environmental strategies, it also has to use effective sustainability management tools for their implementation. (Hörisch, Ortas, Schaltegger & Álvarezvc, 2015) There are many studies reported in the literature on sustainability management tools such as life cycle assessments or sustainability reports. Cost stages are the most important elements in company costing systems therefore environmental accounting mostly have different sort of costs. The main component of environmental accounting is that environmental costs. On the other hand the EEGECOST model was developed to promote environmental accounting in South Africa. The EEGECOST model (Environmental Engineering Group environmental costing model) is based on the principles of the total cost assessment environmental accounting system (Beer & Friend, 2006).

Table 3. Stage in Costing Environmental Sustainability

Stage One	Stage two	Stage Three	Stage Four
Present position	Most sustainable option currently available	Zero net environmental	Past damage
Unsustainable operations		More sustainable operations	Fully sustainable

Source: Bebbington & Gray (2001).

The table (3) above by Bebbington & Gray explains us costing stages in companies. The first stage of the process was to ascertain the scope of the organization's operations Stage two represents the most sustainable

position. Stage three represents a position where operations would have a zero net environmental impact in the current period. Stage four represents a fully sustainable position where operations would have a zero net environmental impact in the current period. Stage four represents a fully sustainable position. After all excellent opinions here another point of view again by Gray is very interesting for the sustainability. (Gray, 2010) "If there are doubts about the epistemological claims over global (un)sustainability, there are doubts of at least equal persuasiveness over the causes of that un-sustainability".

3. 1. A Systematic Approach to the Environmental Accounting Information Systems in the Corporate Companies

Industrial operations worldwide cause significant environmental liabilities; with its associated financial effects. Industries are therefore becoming progressively more aware of the social and environmental liabilities pertaining to their operations and products. (Beer & Friend 2006) The implementation of information systems of environmental accounting is certainly in important dimension over the performance of the corporate companies. It is a fact that companies will have benefit from this hypothetical approach when information based are made. Corporate companies are mostly large scale so they emphasize environmental accounting information more than the small and medium enterprises, therefore in this study I searched corporate companies.
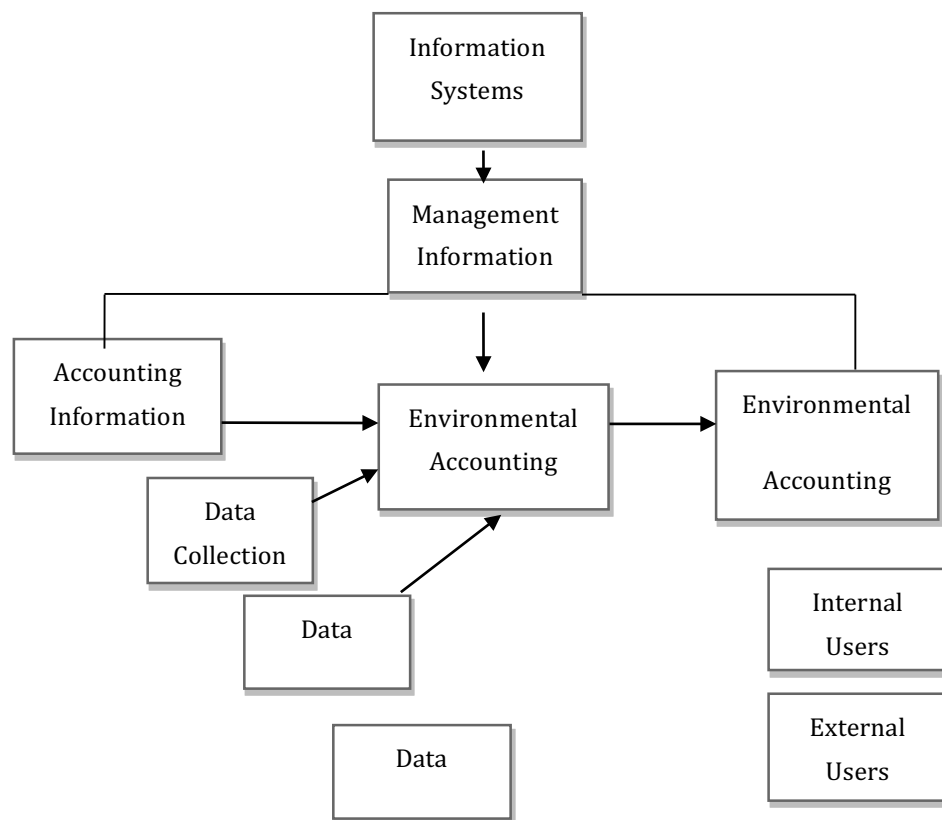
Figure. 3. The Aspect of Environmental Accounting Information Systems In The Corporate Companies.

In the figure (3) above I tried to make a model to explain information systems and environmental relationship in a corporate company which shows clearly data collection and sharing between the systems. We can also clearly see data transitions to environmental information systems in the table. According to an opinion in this context which I strongly support (EPA,1995) Environmental accounting can be an important component of overall corporate environmental management, quality management and cost management. Moreover, Accounting information systems is a subsystems of a company's management information systems consider in terms of the environmental accounting information systems of companies.

3.2. The Information Technology (IT) and Environmental Accounting Information Systems

In today's information-technology–centric world, organizations clearly can neither operate nor survive without information systems. The quality of the information systems and the reliability of the information available through such systems dictate, to a large degree, the effectiveness of decision making within the organization. Without good information, managers cannot make sound decisions(Gelinas&Dull,2008.) Information technology and accounting come in a functional state to produce data and ensure that internal and external users have access to the information they need after they are recorded in the system. After these explanations, we must mention the importance of the functions of accounting. The starting point of environmental accounting information systems and the processes to be focused on the following classification.

Accounting Process:

- Classifying

- Analysing

- Summarising

- Calculating

- Sorting

It is very important that the collected data are integrated and correctly placed within the organization of accounting and environmental systems. The explanation of financial information areas related to environmental information are shown in the table (3.1) given below:

Table. 3. 1. Environmental Accounting as A Part of Information System of the Company

	FINANCIAL INFORMATION (IN MONITERY UNITS)	FINANCIAL INFORMATION (IN MONITERY UNITS)
Other Information	For Internal Users	For Internal Users
	For External Users	For Internal Users
Environmental Information	For Internal Users	For Internal Users
	For External Users	For Internal Users

Environmental accounting

Information System of the Company

Source: Hyršlová, J& Hájek, M,(2006)

Accounting information system (AIS) is a tool which was incorporated in the field of Information and Technology systems. It is very important for business entities. This is the one responsible in generating reliable financial information needed for decision making. There are many varying designs of the system for they must consider factors that influence the way in which information is gathered and reported (Lim, 2013).

Conclusion

Environmental related performance and operations are the important management strategy of the companies. I can only say that primary aim of changing role of accountant must be protect companies by the environmental damages therefore cost-based operations must be taken by accountants. Environmental accounting Information systems has been one of the most important development in accounting practices.

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13

An Overview To Organic Cotton and Turkey

Ayşe Uygur

Abstract

Organic vegetable fibres such as organic cotton, linen etc. were produced in textile area since 1960's. Chemical fertilizers and pesticides are not used during agriculture of organic fibres and GMOs are also forbidden besides a strict certificate procedure is also applied. Conventional cotton which is prominent among all textile fibres is responsible 25 % of total pesticide use in the world and each kg of conventional cotton needs nearly 30 % fertilizer of weight. Turkey is the third organic cotton grower in the world after India, China. Even though some incentives have performed, organic cotton production is still about 0.5 % of conventional cotton production in the world in 2011/12. While conventional cotton production in The World was 27 100 000 tons, organic cotton production was only 139 000 tons in the world and 15802 tons in Turkey in 2011/12. Even though Turkish agricultural areas such as Aegean and South East Parts of Turkey are fertile for organic cotton growing, organic cotton production is still unsatisfactory. Turkey has some additional advantages such as being close to Europe, having textile mills, forbidding GMOs seeds, transportation convenience etc.

Keywords: Organic cotton, Environment, Natural fibers, Ecological textiles, Turkey agriculture.

Introduction

E ven though natural fibres are dated to B.C. 8000 and are being still used; regenerated and synthetic fibres has begun to be produced since A.C. 19. Century i.e. since Industrial Revolution. Industrial Revolution has brought also environmental pollution while industrial production has being increased by using industrial chemicals, fossil fuels such as petroleum, coal, and natural gas (Uygur & Yuksel, 2011). Industrial revolution improved in all industrial areas quickly, The World was polluted and changed as never

seen before such as thinning ozone layer; destruction of ecological life; pollution of weather, water and soil; global warming; climate change; melting icebergs in Poles; increasing waste etc. It may be added the increase of people population in the world to these changes. The interest in environmental pollution increased in 80's all over the world in all areas, in textile as well. Some precautions are thought in textile area such as using natural fibres instead of synthetic fibres; producing organic fibres, ecotextiles, recycled fibres; dyeing by natural dyes; forbidding chloride bleaching agent etc (Watson, 1991).

Conventional natural fibres are obtained from vegetable sources such as cotton, kapok, linen, ramie, hemp, jut, sisal; from animal sources such as wool, mohair, cashmere, silk, spider silk etc. Organic fibres are the special production of conventional natural fibres which do not use chemical fertilizers; toxic pesticides (insecticides, herbicides or fungicides, defoliants) and genetically modified seeds (GMO). Organic fibres requires also a strict certificate procedure for organic fibre cultivation (Textile Exchange–Cotton Briefings, 2011). Organic fibres have sustainable benefits to environment, ecology. Organic cotton, linen, hemp, jute, wool, silk, mohair, alpaca fibres are grown in the world, but cotton is prominent among all organic fibres.

Conventional cotton which is the prominent natural fibre having 38.6% ratio among all textile fibres in 2005/06 are produced in a large amount all over the world. Conventional cotton is responsible 25 % of total pesticide use in the world (Tarakçıoğlu, 2008) and each kg of conventional cotton needs nearly 35 % of fertilizer in weight (Ekolojik Tarım Organizasyonu Derneği, 2015) The production of conventional and organic fibres in the world is given in Table 1 (Tarakçıoğlu, 2008) (USDA, 2016) (Textile Exchange, Material Snapshot Organic Cotton, 2016).

Table 1. Conventional and Organic Cotton Fibre Production in The World

	Conventional Cotton Lint			Organic Cotton Lint		
	Production (M ton)	Cotton % among other fibres	Cotton cultivated area (M Ha)	Production (ton)	Organic Cotton % of conventional cotton	Organic Cotton cultivated area (Ha)
2003/2004	21,135	36,9		25394	0,10	
2005/2006	26,532	38,6	30-36	37799	0,14	
2006/2007	26,751		34,36	57931	0.20	
2011/12	27,100		35,52	139000	0.50	317000
2013/14	25,700			116974	0.40	220765
2015/16	21,87		30,49			

As can be seen in Table 1; conventional cotton production is about 27,100 M tons during 2011/12 , when it is glanced organic cotton; organic cotton production is about 139000 tons in 2011/12 and it is produced about 0.5 % of conventional cotton. These results showed that organic cotton had not registered promising progress for 30-40 years.

Organic cotton is presently produced in 20 countries in all arable continents. India, China, Turkey, Tanzania and the US are the largest producers in 2013/14 (Textile Exchange, Material Snapshot Organic Cotton, 2016).

Organic Cotton Production

Organic cotton production has environmental- ecological positive impacts. Organic cotton production prohibits the use of fertilizers, pesticides and GMOs and a strict certification procedure is applied. The organic fibres cultivation as well as organic cotton is applied by **some natural fertilizers and natural pesticides which will decrease** the pollution of natural sources in the world.

Ceasing Fertilizers

All vegetable natural fibres need some inorganic compounds, organic compounds, water, CO_2, sun light, seed, and soil treatments to grow up. As example, cotton plant requirements under irrigation are 100–180 kg/ha nitrogen (N), 20–60 kg/ha phosphorus (P), and 50–80 kg/ha potassium (K) compounds; chemical fertilizers to supply these compounds are added to soils for the cultivation of conventional fibres (Baydar & Ciliz & Mammadov, 2015).

But these chemical fertilizers are forbidden for organic agriculture since their excessive use creates harmful effects such as soil degradation, reduction of its nutrient and water retention capacity, salinisation, erosion, eutrophication, the overextraction of water and the reduction of ecologic diversity as well as human health on the agricultural area. Carbon nutrient amount 0.5 to 5.0 % of the soil, has also crucial importance (Organic cotton, 2016).

Excessive use of nitrates, phosphates fertilizers and pesticides which occur methane and nitrous oxide gases by spreading air and their solutions in ground and surface waters entail also environmentally and ecologically harmful effects (Baydar & Ciliz & Mammadov, 2015).

1 kg of cotton lint requires 350 g chemical fertilizer and cotton is in the 4th order in the use of synthetic fertilizers (Apelasyon, 2016).

Natural organic fertilizers such as organic manure, compost of green leaves, stalks, roots etc., manure, mulch, liquid organic manure such as (biogas) slurry and micronutrient were used instead of chemical fertilizers to meet the requirement of cotton fibre growth (Organic cotton, 2016 ; Channagouda & Babalad & Dineshkumar , 2015).

Crop rotation is also an alternative practice to fertilize application for the achievement of soil fertility. It helps prevent soils, occurrence of critical pest populations and also diseases and weeds from leaching. It is important to grow cotton in rotation with leguminous plants such as beans, peas or soya beans. Because they fix nitrogen from the air and make it available to the plant, thus improving soil fertility (Organic cotton, 2016).

Ceasing Pesticides

All crops are under the biological effects such as animals, insects, beetles, bacteria, fungi, weed etc. as well as physical and chemical effects. These biologically living beings can give damage to natural fibres resulting the decrease of yield, the quality of fibres, and the increase of difficulties in fibre processing. Pesticides, insecticides, fungicides, herbicides, defoliants are used to prevent these biological effects during the cultivation of crops. Natural vegetable fibres also require pesticides, a leading of natural fibre cotton only consumes 25% of pesticide consumption in the world since it is highly susceptible for pests and diseases. But these pesticides and solvents are quite toxic and excessive use of pesticide depletes the soil nutrients thus the requirement of synthetic fertilisers will increase (The Organics Institute, 2016). Ground and underground waters are also polluted by pesticide contamination causing soil salinisation particularly in dry areas, causing a degradation of soil fertility and the occurrence of methane and nitrous oxide gas (FAO, 2002). Additionally, volatile pesticides or solvents of pesticides are spread into environment causing harmful effect on employees, crops, air, earth, water. These pesticides are persistent chemicals and they leave a toxic residue on cotton lint, leaves, stems, roots, seeds, even in the soil. The amount of pesticide in the earth is increasing as time passes by and entails toxic effects. (Li & Zhang & Li & Zhou& Chen& Tu & Luo & Christie& Hu&Li, 2016). Pesticides are not generally soluble in water and they are persistent chemicals to degradations. Then they may be left on textile products to create harmful effect on textile consumers. That's why, organic chlorinated pesticides are tested on ecological textiles for Oekotex 100 and GOTS standards. Toxic pesticides used in the production of conventional cotton are methamidophos, malathion, aldicarb, parathion, acephat etc. (Tarakçıoğlu, 2008). The total dose of pesticide chemicals vary between 1.85 kg/ha and 10.5 kg/ha in the selected region (Baydar & Ciliz & Mammadov, 2015). There are some researches to remove organophosphate pesticides (OP) from waste waters (Abdelhameed & Abdel-Gawad & Elshahatb & Emam, 2016).

Organic fibre production prohibits the use of pesticide and some natural precautions are suggested to decrease the pollution of natural sources in the world.

Natural pesticides: If preventive measures are not sufficiently efficient and pest populations exceed the economic threshold, a number of natural pesticides can be used in organic cotton cultivation. Some of these are: neem spray, prepared from neem kernels (Azadirachta indica) extract, effective against sucking pests, jassids, bollworms and thrips; pyrethrum, prepared from powdered flower heads or liquid extracts of chrysanthemum, effective against red cotton bug, cutworms, grasshoppers; botanical mixtures, combinations of extracts from different plants such as castor, thorn apple, lantana, custard apple, sweet potato leaves, tomato leaves, ginger, chilly, gliricidia, marigold, etc. Their cost values consist 10% of market price.

Trap crops: Some cotton pests prefer crops like maize, sunflower, okra (lady finger), sorghum, pigeon pea or hibiscus to cotton. By growing these crops along with cotton as a trap crop, the cotton crop is spared.

Promotion of natural enemies: Not using pesticides and diversifying crops benefit natural enemies from cotton pests such as birds, ladybirds, beetles, spiders, parasitic wasps, bugs and ants. They help the farmer keep pest attacks at tolerable levels by providing suitable habitats for these natural enemies of pests.

Crop rotation: This helps prevent leaching from soils, a build-up of critical pest populations and also diseases and weeds (Organic cotton, 2016).

Forbidding Genetically Modified Organism (GMO) Seeds

A GMO, or genetically modified organism, is a plant, animal, microorganism or other organism whose genetic makeup has been modified using recombinant DNA methods (also called gene splicing), gene modification or transgenic technology. This relatively new science creates unstable combinations of plant, animal, bacterial and viral genes that do not occur in nature or through traditional crossbreeding methods (Non GMO Project, 2016).

There are clearly two very different viewpoints when it comes to the health and safety of genetically engineered food industry leaders and scientists who support GMOs and those who believe GMOs are harmful.

People of Anti-GMOs argue that GMOs can cause environmental damage and health problems for consumers and long-term effect of GMOs remain unknown. Most developed nations have significant restrictions or outright bans on the production and sale of GMOs. The U.S. and Canadian governments, though, have approved GMOs based on studies conducted by the same corporations that created them and profit from their sale (Non GMO Project, 2016). 61 Countries in the world, including Australia, Japan, and all of the countries in the European Union, are restricted the production and sale of GMOs. If people stop buying GMOs, companies will stop using them and farmers will stop growing them (GMO Awareness, 2016).

People defending GMOs assume that GMOs can improve yields for farmers, reduce draws on natural resources and fossil fuels and provide nutritional benefits (Live Science, GMO's, 2016) and additionally helps reduce the price of crops (The facts about GMO, 2016).

GMOs have some drawbacks to farmers such as inevitable drift from neighbouring fields and the environment impact such as herbicide resistant bugs etc. The long-term impacts of GMOs are unknown, and once released into the environment, these novel organisms cannot be recalled. GMO Cotton is evaluated as having high risk crops among all crops (The facts about GMO, 2016). Non-GMO labels and some boards are given in Figure1 (GMO Awareness, 2014).

Figure 1 : Non-GMO labels and some boards

GMO seeds are forbidden in the cultivation of organic cotton. GMOs are forbidden in Turkey, and GMOs are not used also in conventional cotton cultivation.

Organic Fibre Standards

Organic fibre production fibres requires organic fibre standard system and only assures that the fibres are produced the lack of fertilizers, pesticides, GMO seeds, thus there will be no pesticide residue on textile products. There are some organic fibre standards in various countries.

Organic Fibre Standards: EU regulation 834/2007; USA National Organic Program (NOP); United Stated Department of Agriculture (USDA) ; OTA: Organic Trade Association (USA) (Agriculture and foods into organic textiles and body care products); Indian National Program for Organic Production (NPOP) ; the Japanese Agricultural Standard (JAS); Soil Association Organic Standard (UK); Organic Guarantee (New Zealand); IFOAM: International Federation of Organic Agriculture Movements (Organic cotton, 2016 ; Hariram, 2016).

Organic Exchange: OE 100, OE Blended Standards and the new Organic Content Standard is also suggested by Textile Exchange (Textile Exchange - Organic Cotton Market Report, 2016).

But textiles are treated in the textile mills such as scouring, bleaching, dyeing, finishing etc., these may also create some toxic effects on environment and the textile consumers. Even though these textiles are produced by organic fibres, it can not be assured that the textile product is safe for human health of consumers. That's why a standard like Global Organic Textile Standard (GOTS) is also added to the organic standard.

Global Organic Textile Standard (GOTS) : Organic Fibre+ Ecological Processed Product : Global Organic Textile Standard stipulates that organic fibres or yarns, fabrics, textile products from these organic fibres were treated and manufactured ecologically and have no toxic effects on consumers. But organic fibres do not include any preventions or precautions to protect environment from toxic by-products contained in the wastewater from manufacturing plants of these textiles pollute wastewaters, giving harmful effects on ecosystem (O Ecotextiles, 2009).

MTS: Market Transformation to Sustainability (Sustainable Textile Standard examines garment sustainability in five areas of sustainability) standards also include ecological textile products.

Ecotextile Standard: There are some ecotextile standards such as EU Flower, eco-label and Oeko-Tex 100 that they do not require organic fibres, but they stipulate that the end textile product were ecologically treated and manufactured and have no toxic effects such as allergy, skin irritations, chemical sensitivity and other health problems.

Better cotton (BCI) **:** Environmentally friendly and sustainable cotton cultivation by controlling all stages without decrease in crop yield, in contrary by increasing the crop yield and keeping the cost the same. Harmful effect decreases 30-50 % that of conventional cotton (Tarakçıoğlu, 2008).

Fairtrade: It is primarily a social label and focuses on improving the working and living conditions of smallholder farmers in the South. However, Fairtrade standards also include environmental criteria. Fairtrade and Organic complement: Combining the two is a way of strengthening the position of farming families socially and environmentally as well as supporting their development efforts (Organic cotton, 2016).

'Better cotton' and conventional cotton were analyzed as using inputs efficiency and financial return parameters. Despite being less efficient in terms of inputs use and financial return, farmers were growing conventional cotton primarily because the government agency responsible for agricultural extension had not paid attention to promotion of "better cotton" as in the BCI project area (Zulfiqar & Thapa & Zulfiqar Farhad &, Thapa, Gopal, 2016). Some labels of ecological cotton are given in Figure 1 (O Ecotextiles, 2016).

Figure 2: Organic Cotton 100; USDA; GOTS; Better Cotton; Fair Trade Labels successively

Cotton quality order: Cotton quality decreases successively from Organic cotton, Better cotton without GMO, Better cotton with GMO to Conventional cotton (Tarakçıoğlu, 2008).

Transition to Organic Cotton from Conventional Cotton

Organic textile production has environmental- ecological, agricultural, governmental, economical, social, marketing etc. diameters.

Organic cotton growing is environmentally and ecologically friendly since it prohibits the use of chemical fertilizers, pesticides, and GMO seeds. It has also contribution to the decrease of global warming by ceasing fertilizers and pesticides, to the decrease of energy requirement, and to the decrease of consumption of the natural sources when compared to conventional cotton.

Conversion of conventional cotton field to organic field needs approximately 3 years and organic cotton yield is approaching to that of conventional cotton in the third year. Therefore, there will be a decrease of cotton yield during these three years which entail the decrease of livelihood of farmers (Baydar & Ciliz & Mammadov, 2015). Additionally, they have no enough knowledge about the organic cotton requirement on the market so the decision for organic cotton cultivation needs also to speculate. Irrigation and rain conditions, marketing the organic products, investment for organic cotton etc. are also some drawback of organic cotton cultivation. In this case, it is necessary incentive precautions for farmers and Governmental support will be critical parameters on this stage.

The availability of advisory services on cotton growing close to agricultural areas are promising the organic cotton growing.

Organic cotton needs more care, labour, procedure than conventional cotton, that's why organic cotton costs approximately higher than 5-50 % than conventional cotton in the world. But the total price of a textile product from organic cotton is higher 5-10 % than that of conventional cotton (Altenbuchner & Larcher & Vogel, 2014; Ponikowski, 2016).

Tablo 2: Cotton lint price in the first 5 countries in 2013/14
(correspond to 96 % of organic cotton world production)

Cotton price ($ / kg)	India	China	Turkey	Tanzania	USA	World Conventional Cotton
Organic Cotton Lint	1,52	2,08-3,20	1,60-2,15	-	2,60-3,40	
Organic Cotton Seed	-	1,04	-	0,43-0,46	-	
World Conv. Cotton Lint						1,48

Organic and conventional cotton prices in 2013/14 period in the first 5 countries of the World are given in Table 2 (Textile Exchange- Material Snapshot Organic Cotton, 2016; Trading Economics, 2016).

Even though some awareness efforts on organic fibres were exhibited, the results are not satisfactory recently all over the world. Some textile companies have begun to produce organic textiles, some of them have begun to produce only an organic line among their products.

The more demand of consumers to organic fibres increases, the more cultivation of organic fibres increases. Basic factors which affect the demand of organic textile products:

1-Sufficient knowledge about organic fibres and the harmful impacts of conventional fibres to the environment, ecology: There is no enough visual or written knowledge to explain, to make the consumers conscious about the production process of organic textiles and the sustainability. 2-Having economical capacity to pay organic textiles being about 10% of higher price than that of conventional one: There are about 8 billion people in the world, most of them are living under insufficient conditions. That's why only people having higher salaries can pay the increase in price of organic textiles. 3-Accessibility to organic textiles: Consumers have different ability during shopping, price, model, colour, season, fibre type, accessibility etc. are the basic reasons. Organic fibres are being produced only in a small amount and it is also difficult to find, to access organic textiles all over the world, this is also a drawback of organic textiles (Oh & Abraham, 2016).

Demand and supply will determine the future of organic textiles.

Organic Cotton Growing in Turkey

The Turkish clothing industry is the seventh largest supplier in the world, and the second largest supplier in the EU. The Turkish textile and clothing industry is developed in terms of quality, design, and capacity. There are approximately 40,000 companies in the sector in 2013.

Organic cotton have been growing in Turkey for about 30 years. Turkey is the third organic cotton growers in the world in 2013 (Textile Exchange- Material Snapshot Organic Cotton, 2016). Turkish organic cotton areas are fertile for organic cultivation, irrigation facilities are satisfactory and cultivation areas are close to textile industry which is developed in Turkey and in Europe, energy sources are also close to GAP region, GMO's are not used in Turkey (Gıda , Tarım ve Hayvancılık Bakanlığı, 2014). Organic cotton is one of the solution of unimployement in the eastern parts of Turkey. The Turkish Government is supporting the progression of Corporate Social Responsibility and improved environmental and social management in textile manufacturing, in accordance with the Sustainable Development Goals (SDG) (TC Kalkınma Bakanlığı, 2015). Turkey's textile is a leader industry in Turkey and the number of GOTS, OE and OCS certified companies is rising recently. Currently, almost 300 are certified to the OE/Organic Content Standards (OCS) and 400 facilities are certified to the Global Organic Textile Standard (GOTS). Turkish organic cotton has high quality, long staple fibres, as well as shorter staple options (Textile Exchange, Turkey Organic Cotton Sourcing Guide, 2013).

Organic cotton is mainly grown in the Aegean Region including İzmir, Aydın, Denizli cities in the west of Turkey and South Region including Çukurova, Antalya having approximately 20-30 % of Turkish organic cotton production and in the Southeast Anatolia (SEA) Region including Hatay, Gaziantep, Urfa, Mardin, Adıyaman cities having approximately 70-80 % of Turkish organic cotton production. GAP Project increased the growing of organic cotton in Southeast Anatolia (SEA) Region, so that while environmentally protection is increasing, economical development will also rise. Irrigation utility, virgin soil relatively low use

of chemicals, low population of pests, inclined people for organic cultivation, and the high quality of cotton crops promote the organic cotton cultivation in the Southeast Anatolia Region. The (Güneydogu Anadolu Projesi) GAP Region has the potential to grow 400000 tons of organic raw cotton and 160000 tons of organic cotton fibres on land of 100 000 hectares, as a result of the infrastructure investments and the spread of organic farming practice across the region. It is clear that the region has real potential to become a significant supply centre for organic textile manufacturers.

Aegean organic cotton like conventional cotton is longer than SEA cotton, and is one of the highest quality of the world and it is suitable for combed cotton. SEA cotton is suitable for open end spinning and especially for denim products.

Transition to organic fibres from conventional cotton requires about three years and the organic crop yield decreases during these years by entailing the decrease of cost value which is important for livelihood of farmers. The cost of organic cotton is estimated to be higher 8 to 10 % than that of conventional cotton. Organic Cotton Fibre Production in Turkey is given in Table 3 (Textile Exchange, Turkey Organic Cotton Sourcing Guide, 2013).

Tablo 3. Organic Cotton Fibre Production in Turkey (mt)

Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Organic cotton production	10460	14360	23152	24440	27324	11599	9613	15802

As can be seen in Table 3, organic cotton production is between 10460-15802 tons/year between 2004-2012, in Turkey. Total organic cotton is about 139000 tons in the world 2011/12 and the production of Turkish organic cotton compensates 11% of organic cotton production of the world in 2011/12 .

Organic cotton needs a hard certification procedure from cultivation stage to spinning, weaving, knitting, finishing, sewing, retailing stages. Organic Exchange OE/ Organic Content Standard (OCS) and Global Organic Textile Standard (GOTS) are used as standards in Turkey.

Control Union Certifications offer also these above two certification programs for sustainable textile production.

Turkey is the second biggest supplier country for Fair Wear Foundation (FWF) affiliated companies, 170 factories are supplying 26 affiliates (Textile Exchange, Turkey Organic Cotton Sourcing Guide, 2013).

Conclusion

It is obviously seen that world is getting dirtier day by day. All sustainable precautions to prevent the pollution is worth to stimulate, like organic cotton, to leave habitable world for future generations.

Organic cotton which is the leading natural fibres have environmental- ecological benefits by ceasing pesticides, fertilizers, GMO, therefore environmental sources such as weather, water, soil besides human health and ecosystem will be protected. Organic cotton cultivation will supply sustainable production being environmentally friendly.

Transition to organic cotton requires about three years which entail the decrease of livelihood of farmers, so there is farmer's economical lost during transition period. Compensation of this lost is the main and important problem. The premium of organic cotton may surpass the conventional cotton if the first three years are compensated by some ways. This may be supplied by governmental support, incentives may be increased all over the world, so transition to organic cotton may be performed gradually.

Additionally, organic cotton lint price is about 5-50 % higher than that of conventional cotton which makes more expensive the final textile products about %5-10 than that of conventional cotton, so there is also the diameter of textile consumers. If consumers demand and pay this premium of organic production, offer of farmers will increase, therefore social awareness of consumers must be increased to buy organic products. Despite of harmful effects of conventional fibres to environment and human health; for examples the production ratio of organic cotton in conventional cotton is still 0.5 % in 2011/2012 period, this revealed that social interest must certainly be created. Demand, it was said, will overcome these issues. There are mainly environmental- ecological, agricultural, governmental, economical, social, marketing diameters from the transition conventional cotton to organic cotton.

Turkey is promising country for organic cotton production and is the third grower country in the world recently. Textile importation and textile exportation is important in Turkey and depend on the development in the World. The collaborations among Farmers Associations, Agricultural Boards, Manufacturers, Governments, Trademarks, Non Governmental Organisations, Consumers Associations and Fashion Designers may increase the amount of the transition to organic cotton from conventional cotton in the World. Organic cotton is the sign of sustainability.

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The Sustainability of a Family Business in Multiple Perspective: The Case of Uslu Selim Halvah Business in Uşak

Recep Kurt

Abstract

Sesame paste and halvah production were started in 1870 in Uşak by Hacı Ahmet Dede. The production of them passed from Halil İbrahim Vidinlioğlu who was the son of Hacı Ahmet Dede to Mustafa Kemal Vidinlioğlu who was the grandson of Hacı Ahmet Dede. Nowadays, 5th and 6th generations are still going on the production of sesame paste and halvah. In 1999, Uslu Selim Halva Business was reached company's name and corporate identity. Actually, Uslu Selim is the continuation of halvah production from grandfathers to grandchildrens. Moreover, it has the production licence of 14 kinds of products except for sesame paste and halvah. The aim of this paper searches the recent career plans of 4th,5th and 6th generations, the policies of human resources, the roles of women in this family business, the similarities and differences of the values of founder and family members, the level of the intergenerational conflict and differences such as cultural, business approach, opinion and management. Moreover, the financial problems and its solutions, the raising and education of children in family and all the impacts of these policies on the sustainability of this family business are tried to explore in multiple perspective. The interview method is utilized to obtain all the information about family members and business. The women in this family are keeping in the back-ground. The raising and education of children in this family are extremely important. For this reason, the education level is remarkably higher. This family business continues its productions and existence with sustainability.

Key Words: Family Business, Sustainability, Business History, Uslu Selim Halvah

Introduction

Family businesses clarify a tremendous rate of employment, investment, revenues, and GDP in most of countries. In Turkey, the vast large of firms in Turkey (99.80%) are small and medium enterprises SMES and generally their management is done by their families. Moreover, they employ 74,2 percent of the work force and create about 55 percent of wages. They operate 39,9 percent of wholesale and retail trade, 31,8 percent of the maintenance of vehicle, 15,7 percent of transport and storage and 12,6 of manufacturing industry.[1] They play a crucial role in Turkish economy.

In most of these businesses, founders attempt to maintain their tradition and provide continuous family control via intergenerational progression when they leave management. This paper begins with the business history of Uslu Selim Halvah and it is also the history of Vidinlioğlu family, followed by the roles of gender, privately women in this family, the life of children and then the conflicts in the family business. The final step is conclusion and the observations are shared about this family business.

The Uslu Selim Halvah in Uşak from Past to Present

The Business History of Uslu Selim Halvah

The family of Vidinlioğlu emigrated from Vidin province of Bulgaria in nineteenth century and they were divided into four branches. These branches were İstanbul, Balıkesir, Samsun and Uşak. They have been living in these cities.

According to a survey conducted by Ahmet Vidinlioğlu, the owner of Vidinli Hotel in Samsun belonged to one of the family members who migrated from Vidin Province. Today's hotel manager is the person whom this family adopted.

Hacı Ali Dede, came to Usak's Yavu Village. According to Mehmet Özaydın's transfer, Hacı Ahmet Dede learned how to make halvah from Rum in Uşak. Kemal Öz Mahallesi in Uşak is a settlement where Rums lived in.

Until 1957, the production of halvah was continued in an inn which was a popular place for stores. After 1957, the municipality wanted them to move from this inn to a new place. It gave them a new store. This store is still using by this family.

In 1963-65, the brothers of Ahmet Nuri and Mustafa Kemal Vidinlioglu left halvah business and two brothers started to sell white goods and glasswares. It was the first AEG dealer in Uşak. In 1970, these brothers were separated from their partnership and Mustafa Kemal Vidinlioğlu returned to produce halvah and continued this work until he died in 1979. Ahmet Vidinlioğlu, the eldest son of Mustafa Kemal

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[1] http://www.tuik.gov.tr/PreHaberBultenleri.do?id=21864#, access date:08.11.2016

Vidinlioğlu, graduated from Boğaziçi University and got Electronics Associate Degree between 1974 and 76. After his father's death, he took over the head of the business. Ahmet Vidinlioğlu states:

> *"His sister Nurten Vidinlioglu was a kindergarten teacher and earns 1500 TL per month. The other sister Ayşe Vidinlioğlu was a teacher of Turkish Language and Literature. His brother Halil İbrahim Vidinlioğlu graduated from the model department of industrial vocational high school in Uşak. Ahmet had to work in their family business."*

Ahmet Vidinoğlu went on making halvah for the continuity of family business. However, he had a good education and the possibility of finding a good job in the conditions. Ahmet Vidinlioğlu continued to operate from 1979 until the end of 1987.

According to records of the chamber of grocery stores in Uşak, Tülay Vidinlioğlu, his wife, continued to operate from the beginning of 1988 until the end of 1999. At the beginning of the 1990s, the business was started to export to Norway and Sweden. As a protection against the economic crises, they joined to wholesale and retail foods sector. One of the most important reasons for the beginning of wholesale and retail food sector was the transformation of crises into an advantage and the lack of market in the Uşak.

When it came to 1999, the family business went on its way by becoming a limited liability company. Until 2005, Uslu Selim Halvah Business preferred natural methods in production. The use of natural raw materials and Vidinlioglu halvah production method which is the inheritance of family generations has been effective in production. Despite the fact that it was becoming disadvantageous to other competitors in the market, the demand for the natural product that has come to fruition in the customer has had a positive effect on the sales. Especially the use of domestic raw materials such as sesame and sugar contributes to the economy of Uşak and its production is really well-known in Uşak with delicious taste. Due to the decrease in cost and increase in competition between 2005 and 2008, they gave up traditional methods. Despite the increase in production between these years, the increase in the criticism of the customers led the business to return to the natural production method again. Nowadays, they are attempting to increase their institutionalization level.

The Sustainability of Uslu Selim Halvah Business in Multiple Perspective

The Role of Gender In Uslu Selim Halvah Business

In this part, the role of women in this family is mainly focused on. The family members of women in family businesses have a different role such as wife, bride, parent, sister, aunt etc. Women played a significant hidden role in family firms. This means that women in family businesses do not participate in decision-making and management process.

Table 1. Successor characteristics dimension: Gender issues[2]

Study	Characteristic	Effect
Rosenblatt et al.(1985)	Distrust of daughter when she marries and changes her name.	
Birley (1986)	Oldest son seen as primary candidate.	
Prokesch (1986)	No glass ceiling for women.	Positive
Ward (1987)	Financial inducements for daugthers to stay away.	
	Oldest son looked as prime successor.	
Korman and Hubler(1988)	Son's wife not expected to play role in FOB.	Negative
	Daughter's husband often expected to join.	
	Women given negative messages about abilities and interest in FOB very young.	
Goldberg (1991)	Position in family often dictates standing as potential successor	
Goldberg and Wooldridge(1993)	First born and only children more likely to comply with parental wishes.	
Martin (2001)	Daughters are not heirs apparent.	
Garcia-Alvarez et al. (2002)	Daughters succeed if they are first born or have no brothers.	

Rosenblatt et al mentioned that the loyalty of a daughter decrease after her marriage. Nurten Köknar and Ayşe Hürriyet Vidinlioğlu the daughter of Mustafa Kemal Vidinlioğlu and the sister of Ahmet Vidinlioğlu, helped to produce halvah while they were young. After Nurten's marriage, she came to İstanbul. She worked as a teacher. Although both of sisters are far from Uşak, they help their family business when they come to Uşak. There is no observation about distrust of daughter when she marries and changes her name. The proposition of Rosenlatt et al is not appropriate. Besides, they stated:

> *"We always support our family in a financial and spiritual way and our brothers are too. The brotherhood is more important than others."*

Korman and Hubler argue tthat daughter's husband often expected to join. Murat, the husband of Nurten, worked as a manager in İstanbul. He was very busy about his work but he helped exchange of views about how they develop their products and expanded the vision of the family business. This result may back up Korman and Hubler.

According to the studies of Birley and Ward, the oldest son is seen as primary candidate for leadership. After the death of Mustafa Kemal, Ahmet managed their family business. However, he had a qualified education background and different work choices, he had to turn back to Uşak for continuity of this family business such a chief executive. Because, he was elder brother in this family and Halil İbrahim was very young when their father died.

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[2] Rodger W. Griffeth, David G. Allen, Rowena Barrett, Integration of family-owned business succession with turnover and life cycle models: development of a successor retention process model, Human Resource Management Review, 2006, vol. 16, no.4 pp. 500.

Korman and Hubler pointed that son's wife is not expect to play role in family business. According to the registration of the chamber of grocery stores in Uşak, Tülay Vidinlioğlu, the wife of Ahmet, was registered from 1988 to 1999. Banu Vidinlioğlu, the daughter-in-law of Ahmet and Tülay, stated:

> *"I go to fair with my husband and present our products to customers. I want to support my husband and like my job"*

Sefa Vidinlioğlu, the husband of Banu and the son of Ahmet and Tülay, stated:

> *"Banu graduated from department of art teacher so she looks around more differently than me and she can see more details about the design of products and advertisement"*

The proposition of Korman and Hubler is not convenient for Vidinlioğlu family and their business.

Another proposition of Korman and Hubler is that women are given negative messages about abilities and interest in FOB very young. Tülay explained:

> *"My mother-in-law always supported me to work for our business. I noticed her self-sacrifice and wish about our business and family. She was an excellent example for me about what a woman can do for her family"*

This proposition also does not correspond to this family. The results of Garcia-Alvarez et al. can not test for this family. Because, daughters in this family are not first born and they have their brothers.

Generally, the chief executive of a family business is the husband or father who is leader of family. Moreover, women in any family business such as a wife or mother assist to back up the operation of the business. They usually manage their domestic life in their family. Nurten and Ayşe Hürriyet helped their family as labor force when they were young. Ayten who was their mother, worked her family business. Tülay expressed:

> *"I learned to work from my family before I married with Ahmet. I worked with my husband to support him, shared all things and spend my time with him. Firstly, I learned how make a halvah and its ingredients from my mother-in-law. We cleaned soapworts and sesame, boiled soapworts, browned flour for making a red halvah. Then, I washed the dishes when others did them. We also packed our products and paid attention about weighing the packages"*

Tülay continued:

> *"In1980s, I wanted to work in our grocery store but in these years, it was not acceptable to work in a grocery store as a woman. After I had my children, I looked after my sons."*

Banu, the newest daughter-in-law of this family, stated:

> *"I met the production of the halvah and its business after my marriage. I did not think that Sefa was interested in halvah production before our marriage. I want to support my husband. I work with my*

> *husband for night or evening shifts, fairs such as a stand hostess, waiting for our products and preparing treats"*

When we evaluate all the expressions, all the women in Vidinlioğlu's family join to the labor force of family business in secondary or primary role. After their marriage, especially for daughter-in-laws, this family business plays an important role such as a school. They learn the values of this family and its business and can adapt this new environment very easily. They join to not only family but also family business such as labor force in different roles.

The Raising and Education of Children at Uslu Selim Halvah Business

The raising and education of children are an extremely significant for the future of a family business. This is a vital obligation for the sustainability of a family business. In addition, the children of a family business are the candidates of a chief executive for their own business. In other words, they are the successors of a family business.

Table 2. Parent–successor relationship dimension: Childhood experience with business[3]

Study	Characteristic	Effect
Longnecker and Schoen (1978)	Succession begins in childhood.	
Alcorn (1982)	Perception of business made in high school.	
Jonavic (1982)	Starting at the bottom as a teen.	Negative
Rosenblatt et al.(1985)	Source of cheap labor when young.	Negative
Bork (1986)	Early work experiences fun.	Positive
	Parents have positive attitudes about FOB.	Positive
Ward (1987)	Parental grumbling about work at home.	Negative
Lea (1991)	Positive experience as a youngster.	Positive
	Balance in parents' life.	Positive
Aronoff and Ward (1992)	Attitudes result from childhood experiences.	
Goldberg (1996)	Introduced to business at an early age.	Positive
	Work in business from an early age.	Positive
	Happy childhood.	Positive
Aldrich and Cliff (1993)	Experiences important.	

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[3] Rodger W. Griffeth, David G. Allen, Rowena Barrett, Integration of family-owned business succession with turnover and life cycle models: development of a successor retention process model, Human Resource Management Review, 2006, vol. 16, no.4 pp. 496.

Table 2 indicates the studies of childhood experiences about their family and own business. The education and rising of children are actually paramount for Vidinlioğlu's family. The education level increases from generation to generation. Because the access of the education is remarkably easy.

The main education starts in their family. The case of Vidinlioğlu's family is a good example for this. All the children of Vidinlioğlu's family got their education in their family firstly. This family education determines their future. For example, Nurten said that

> *"To be a member of Vidinlioğlu's family is very important. My mother always explained how we behave in a society".* She gave an example about this *"You should walk steeply when you are on the street. You do not want anything again when you go on a visit to someone. Because, they may not have more. You have to be modest"*

Tülay stated:

> *"The education of my children is very important for me. We spent our time for Sefa and Nida to get more education. I wanted them to be upright against the life and have more true life. In addition, I warned them that you do not make others gossip about our family name."* As this example, the children got their education especially on their behavior from family members. They use not only their own name but also the name of their family business.

The children's succession cycle starts in their adolescence. In this family, all the children (the daughters and sons' family) joined to work life when they were teenage stage for learning work style and helping to their family business without the break in their official education. The studies of Alcorn and Jovanic do not prove this situation. Bork noted that parents have positive attitudes about FOB and early work experiences are fun. They were willing to work for their family business. This significant experience is actually significant for them. The study of Bork is acceptable for this family and Golberg is too.

The life of family and its balance influence the life of heirs. Ward and Lea's studies focused on this situation. In this family, the balanced life of family affects the children positively to continue their family business. These conditions motivated them in a good way.

The Conflicts or Not at Uslu Selim Halvah Business

There are many conflicts in the family business but this situation depends on the culture and constitution of family. In addition, conflicts sometimes develop the family business and sometimes create crucial problems. In this part, the conflicts are evaluated.

Goldberg, Dyck et al and Cabrera-Suárez mentioned that good communication and relationships develop the family business and also successors. The role of parents in Vidinlioğlu's family is very important but they do not have any pressure on their successors. If they have problems about their family business, they solve their

various problems with dialogues. The relationships of family are extremely strong and they share their opinion with each other. This increases the sustainability of this family business.

This situation also assists to transfer knowledge and cultural stock to new generations easily. Cabrera-Suárez discussed the transfer of knowledge. Ahmet stated: *"I always share my knowledge about everything"*. On the other hand, Tülay stated: *"I usually balance the relationships and share my experience with younger generation to improve their abilities"*. They also share not only their financial stock but also social stock. This helps successors to adapt the family and its business.

Aronoff and Ward note that parental enthusiasm for their family business influences them in a positive way. Before Tülay explained similar situation; "her mother-in-law was willing to work for their family business and also she was an excellent example for her". Ahmet always works their family business and is eager to work and develop his business and this is a good example for Sefa and Nida, who are the successor of Uslu Selim Halvah Business.

Conclusion

SMEs are building the tremendous part of Turkish Economy and they contribute either Turkish economy or the economy of world. The family businesses create mostly ratio of SMEs. The family businesses are an extraordinarily pivotal for academic life.

Uslu Selim Halvah Business is a family business in Uşak and important for the history of economics in Uşak. For this reason, I chose this family business. This family business has produced the halvah and other various products and continued since nineteenth century. This is a valuable example for us.

The literature shares the important knowledge about the role of women in family business. Generally, women have secondary or hidden role. In this case, many of women in Vidinlioğlu's family work various stages and assist for either their husbands or their family business. They play an important role and the equality of their daughters and daughter-in-laws is a remarkable point. Especially, the daughter-in-laws of this family also attended the labor force eagerly. Tülay Vidinlioğlu is an actually excellent example for the next generation of this family. According to the registration of chamber of grocery store in Uşak, she worked there from 1988 to 1999.

The family members of Vidinlioğlu educated their children and the education level of children increased. This is a big investment to improve their human capital and influences positively. The successors of this family also learned the various values of their family. In addition, they are the label of their family business. This one also boosts the significance of family education. They started work life early ages and gained experiences at any level. This caused a successful transition period. In this case, all the results supported.

As an example of Vidinlioğlu's family business, the dialogues increase achievement of family business and the adaptation of successors dramatically. They have good communication and relationships. This also assists them to increase their strength against the economic crises.

In a nutshell, Uslu Selim Halvah Business has reached from past to now and it will continue forever.

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15

A Research on Sustainability Indices: BIST Sustainability Index

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Abstract

The purpose of this study is to observe the sustainability performance of enterprises in Borsa Istanbul (BIST) Sustainability Index. Under this study, the research is carried out into what the corporate sustainability is and into the purpose of BIST sustainability index. In this study, literature research was carried out; BIST Sustainability Index website and the websites of 43 enterprises on this index were also investigated. Results indicate that all of the sustainability reports of enterprises on Bist Sustainability Index were found out to be complete and conclusive. The study has revealed that the importance of the sustainability in Turkey and the fact that the enterprises were on this index, enough effort is being made. This paper suggests to apply BIST Sustainability Index to all enterprises in Borsa Istanbul.

Keywords: Sustainability, Sustainability Report, BIST, Turkey

1. **Introduction**

Corporate sustainability activities have recently started to occupy an important place of all enterprises in the capital markets. Corporate sustainability is emerged with similar definitions in many studies. Sustainability grounds the development debate in a global framework, within a continuous satisfaction of human needs constitute the ultimate goal (Newell & Pizer 2002). Another definition for corporate sustainability is a business approach that creates long-term shareholder value by embracing opportunities and managing risk from economic, environmental and social dimensions (Dow Jones

Sustainability Indexes). Corporate sustainability is also defined as meeting the needs of a firm's direct and indirect stakeholders such as clients, shareholders, employees, communities etc. (Dyllick & Hockerts, 2002).

On a surface level, the adoption of corporate sustainability principles becomes visible through technical solutions, the publication of corporate sustainability reports, the integration of sustainability measures in employee performance evaluation, or employee training. This provides the context for the adoption of sustainability practices (Dunphy *et al.*, 2003). On a value level, the adoption of corporate sustainability principles takes place through changes in employees' values and beliefs towards more ethical and more responsible values (Crane, 2000). On an underlying level, the adoption of corporate sustainability principles requires a change in core assumptions regarding the interdependence of human and ecological systems (Purser, 1994).

The phrase the Triple Bottom Line (TBL) was first coined in 1994 by John Elkington. Elkington was revealed the TBL concept, inspired by the environmental, social and economic sustainability dimension of the Brundtland Report. (Elkington, 2004: 1). The concept of the TBL consists of three dimensions as People, Planet and Profit. These concepts (People, Planet and Profit) are represent the environmental, social and economic dimensions of sustainable growth and these dimensions are viewed from a micro perspective at the level of enterprises.

The concept of the TBL concern with how enterprises manage their social, environmental and economic responsibilities and how they provide the balance between them. (Jamali, 2006: 812). Enterprises are reporting on what they are doing under social, environmental and economic performance headings with the TBL. For this reason, the concept serves as a reporting tool in determining what enterprises do and do not do about sustainability.

TBL attracted the attention of global enterprises that wanted to create a good global identity and corporate image. Enterprises have tried to strengthen their corporate image by using the TBL in their reports. Shell is the first company to work with Elkington's Sustainability Consulting firm and use it in TBL reports. Consulting firms have focused on TBL can be transformed into principles that assist businesses in measuring their performance but have not been able to achieve a proper result. In 2006, the Global Reporting Initiative (GRI) was established to focus solely on this issue and international standards were developed for reporting sustainability (Mitchell *et al.*, 2007: 271-272).

Elkington states that businesses need to fulfill their environmental, social and economic responsibilities and that businesses can only achieve success in this way. Handling only one dimension is not enough for success. Elkington (2004) argues that businesses can not achieve profits in the long run without adding value to people and the planet and criticizing the profit-oriented views of businesses. According to Jamali (2006: 812), businesses are only increase the economic benefits of their shareholders from a short-term perspective; because they are responsible for shareholders. However, businesses are responsible towards the community and other stakeholders they affect many aspects of their activities.

Businesses continue their activities in the knowledge era that they are constantly changing. Today, organizations constantly renew themselves and adapt to changing conditions. Businesses should increase living standards, to educate their employees, to develop their suppliers and support non-governmental organizations in the regions where they operate (Mitchell *et al.*, 2007: 271). Through its activities, it should not pollute the environment and should develop methods to reduce environmental pollution. Therefore, businesses must change due to increased social pressures. Along with the change, economic interests come to the forefront as well as the other dimensions (Elkington, 2004: 3-7).

Borsa İstanbul is a member of UN Global Compact and UN Principles of Responsible Investment (UNPRI). BIST Sustainability Index aims to provide a benchmark for Borsa İstanbul companies with high performance on corporate sustainability and to increase the awareness, knowledge and practice on sustainability in Turkey.

Some enterprises have begun to publish corporate sustainability reports and we aimed that to observe the enterprises in BIST sustainability index.

2. Methodology

The research is a qualitative research and the content analysis is chosen as a research method. The methodology of our research will be composed of two steps. First step was gathering data from their mission and vision expressions. Second step was evaluating and analyzing their mission and vision statements with NVIVO qualitative research program. The analysis and evaluations were based on Elkington's Triple Bottom Line concept.

2.1 Limitations of the study

Two limitations are present in our research. First limitation in this study; we have limited time to evalute all enterprises in Bist Sustainability index and Bist100 index. For this reason 20 firms in both indices were selected randomly (attention has been paid to the fact that the firms are different and independent from each other). Second limitation in this study; it's not known the firms are being investigated actually implementing their mission and vision statements in real life.

2.2 Sample and Data Collection

The purpose of this study is to observe sustainability performance of enterprises in BIST Sustainability Index. Data collected from Borsa Istanbul Sustainability Index website, Borsa Istanbul 100 Index and the websites of the 40 enterprises on Bist Sustainability Index and Bist 100 Index.

2.3 Findings and Evaluations

Thanks to BIST Sustainability Index, enterprises accelerated their sustainability works to become a part of BIST Sustainability Index. We also found that sustainability efforts effected their missions, visions and

strategies positively. And also all of the enterprises began to include sustainability reports in their financial reports.

The list of Bist Sustainability index below.

Table 1. Bist Sustainability Index Constituents for the Period between November 2016 - October 2017

1	ADEL	ADEL KALEMCİLİK	23	PETKM	PETKİM
2	AKBNK	AKBANK	24	SAHOL	SABANCI HOLDİNG
3	AKSEN	AKSA ENERJİ	25	SAFGY	SAF GMYO
4	AEFES	ANADOLU EFES	26	SISE	ŞİŞE CAM
5	ARCLK	ARÇELİK	27	HALKB	T. HALK BANKASI
6	ASELS	ASELSAN	28	TSKB	T.S.K.B.
7	BRISA	BRİSA	29	TATGD	TAT GIDA
8	CCOLA	COCA COLA İÇECEK	30	TAVHL	TAV HAVALİMANLARI
9	DOHOL	DOĞAN HOLDİNG	31	TKFEN	TEKFEN HOLDİNG
10	DOAS	DOĞUŞ OTOMOTİV	32	TOASO	TOFAŞ OTO. FAB.
11	EREGL	EREĞLİ DEMİR CELİK	33	TUPRS	TÜPRAŞ
12	FROTO	FORD OTOSAN	34	THYAO	TÜRK HAVA YOLLARI
13	GARAN	GARANTİ BANKASI	35	TTKOM	TÜRK TELEKOM
14	GLYHO	GLOBAL YAT. HOLDİNG	36	TTRAK	TÜRK TRAKTÖR
15	ISCTR	İŞ BANKASI	37	TCELL	TURKCELL
16	ISGYO	İŞ GMYO	38	ULKER	ÜLKER BİSKÜVİ
17	KCHOL	KOÇ HOLDİNG	39	VAKBN	VAKIFLAR BANKASI
18	KORDS	KORDSA GLOBAL	40	VESTL	VESTEL
19	MGROS	MİGROS TİCARET	41	VESBE	VESTEL BEYAZ EŞYA
20	NETAS	NETAŞ TELEKOM.	42	YKBNK	YAPI VE KREDİ BANK.
21	OTKAR	OTOKAR	43	ZOREN	ZORLU ENERJİ
22	PGSUS	PEGASUS			

Source: http://www.borsaistanbul.com/en/indices/bist-stock-indices/bist-sustainability-index

We conducted a research on twenty companies' mission and vision statements below for our paper. In a majority of their missions and vision statements we encountered words related to sustainability.

Table 2. Vision/Mission of Bist Sustainability Index (20 Firms)

ORDER	COMPANY NAME	Vision/ Mission	
1	ADEL KALEMCİLİK	Vision	To be the largest Stationary Group in Turkey and also be involved in international operations.
		Mission	To provide high quality and reliable products within the scope of our values with reasonable prices. To grow in Turkey and other countries.
2	AKBANK	Vision	To become a sustainable leader by rendering excellent banking experience and supporting Turkey's growth
		Mission	To become the most admired Turkish company continuously delivering great value to its stakeholders via ıts highly skilled human resource
3	AKSA ENERJİ	Vision	Working towards a vision of becoming the largest and most reliable power in the region.
		Mission	To continue to implement our highly efficient projects with our sensitivity for technological developments and our educated staff, who continually renew themselves and operate at the highest level of quality, utilising the support of our extensive knowledge and experience in the energy industry.
4	ANADOLU EFES	Vision	To be the most admired beverage company in our markets
		Mission	To bring people together to share moments of life by enjoying our brands responsibly
5	ARÇELİK	Vision	Respects the Globe, Respected Globally
		Mission	to ensure profitable and long-term SUSTAINABLE GROWTH, to increase market share acting on GLOBAL TARGET MARKET approach, to reach more consumers with INNOVATIVE products and applications in rapidly changing world, to secure the future with the consciousness of CORPORATE RESPONSIBILITY, to integrate and optimize the components of GLOBAL ORGANIZATION to be a global group.
6	ASELSAN	Vision	Being a national technology company that maintains its sustainable growth by creating value in the global market; preferred due to its competitiveness, trusted as a strategic partner, and caring for the environment and people.
		Mission	By focusing primarily on the needs of the Turkish Armed Forces; to provide high-value-added, innovative and reliable products and solutions to both local and foreign customers in the fields of electronic technologies and system integration; continuing activities in line with global targets as well as increasing brand awareness and contributing to the technological independence of Turkey.
7	BRİSA	Vision	Brisa evaluates the expansion opportunities within Turkey to build future tyre demand.
		Mission	The Business family Model we have been implementing in house defines roles in the organization, fundamental responsibility examples, performance indicators, knowledge/skill/experience and competences, and our remuneration policy is based on an objective system relying on our Business Family Model.

8	COCA COLA İÇECEK	Vision	Our vision serves as the framework for our Roadmap and guides every aspect of our business by describing what we need to accomplish in order to continue achieving sustainable, quality growth.
		Mission	Our Roadmap starts with our mission, which is enduring. It declares our purpose as a company and serves as the standard against which we weigh our actions and decisions.
9	DOĞAN HOLDİNG	Vision	To undertake efficient and sustainable investments in services, trade and industry that actively contribute to transparency in society as a whole and to the economic welfare and stability of the individual.
		Mission	To identify, develop and implement stateof- the art commercial and technological applications in consumer-facing products and services; to establish the institutional facilities and capabilities necessary for the effective execution of these efforts in Turkey and the region.
10	DOĞUŞ OTOMOTİV	Vision	Doğuş Otomotiv's vision is to provide creative and innovative services that surpass expectations
		Mission	Doğuş Otomotiv aims at being an automotive company that acts with the mission of; operating with a focus on achieving ultimate customer satisfaction, Being well-informed about the industry and the market, Understanding what its stakeholders expect, defining further expectations and seeking to meet them all with maximum satisfaction, Employing creative and innovative workforce, and making good use of technologies, Being reliable and trustworthy, and Providing productive and profitable services across the entire automotive value chain.
11	EREĞLİ DEMİR CELİK	Vision	Becoming a World-Class Company
		Mission	A Valuable Brand, A Well-Known, Reputable and Admired Company, Happy and Loyal Employees, Attracting and Developing Talent A Global Point of View, Shaping the Needs of Customers, A Unique Production System, Lean, Flexible and Agile, A Strong Financial Basis A Strong Commitment to Innovation, Respecting Society, Humans and the Environment.
12	FORD OTOSAN	Vision	Being Turkey's most valuable and most preferred industrial company.
		Mission	Providing innovative automotive products and services beneficial to the community.
13	GARANTİ BANKASI	Vision	Is to be the best bank in Europe.
		Mission	Is to continuously and noticeably increase the value we create for our customers, shareholders, employees, the society and the environment by utilizing our influence, agility and organizational efficiency.
14	GLOBAL YAT. HOLDİNG	Vision	Global Investment Holdings aims to become a leader in its operations, to initiate new and innovative projects with growth potential and to become a pioneer in developing and evolving the business environment in Turkey.
		Mission	The Holding is committed to developing portfolio of competitive companies, within the sectors in which it operates, with strong and healthy growth prospects in conformity with global standards. The Holding is also responsible for updating strategies for its subsidiaries, along the lines of the changing local and global environment, as to ensure their quick adaptations to changing business conditions and help their continuous growth.

15	İŞ BANKASI	Vision	The most preferred, trustworthy, leading bank in Turkey!
		Mission	To be the most preferred bank in Turkey for the customers, shareholders and employees, by maintaining our position as the leading, pioneering and most trustworthy bank.
16	KOÇ HOLDİNG	Vision	We, Koç Group, with all our people, aspire to ensure customer satisfaction and sound growth by providing products and services of universal quality and standards. We are committed to being a symbol of trust, continuity and esteem for all our stakeholders: our country, customers, shareholders, dealers, and suppliers.
		Mission	The quality of our products and services is based on the quality of our people. For the continuity of Koç Group, we follow a policy of recruiting the best people, and providing opportunities for development and advancement. To fully utilize the talents, strength, and creativity of our people, we create a work environment which nourishes increased productivity, cooperation, and solidarity.
17	KORDSA GLOBAL	Vision	Agile Kordsa Global in High Value Businesses for Sustainable Growth
		Mission	To deliver high value-added reinforcement solutions, globally.
18	MİGROS TİCARET	Vision	To be an organized retailer who remains the closest to customers by serving them in a variety of formats through a strategy of pursuing expansion both in its own and in neighboring national markets and always exceeding customer expectations.
		Mission	To play a leading role in improving the quality of life at home and abroad with a business structure that is as innovative and productive as it is customer-focused, trusted, and mindful of people, the community, and the environment; to generate long-term, satisfying returns for its employees, business partners, and shareholders; to maintain its sectoral leadership in growth and operational profitability.
19	OTOKAR	Vision	Otokar preserves the local and national characteristics of its products by developing its technology in-house, and aims at the continued satisfaction of its customers, employees, and shareholders by embracing a total excellence philosophy.
		Mission	The key mission of Otokar is to design, manufacture, and market commercial vehicles and various defence industry products developed in line with customer expectations that have global competitive power.
20	PEGASUS	Vision	To be the leading low-cost airline in our region with our innovative, rational, principled and responsible approach. Our leadership criteria: numbers of guests, our response to customer expectations, our pricing policy and the added value we provide to the Pegasus Family.
		Mission	We believe that everybody has the right to fly. The Pegasus Family, our suppliers and our partners work together in cooperation to achieve this goal.

Table 3. Vision/Mission of Bist 100 Index (20 Firms)

ORDER	COMPANY NAME	Vision/Mission	
1	AFYON ÇİMENTO SANAYİ T.A.Ş.	Vision	To become the most valuable cement and ready mixed concrete company in Turkey
		Mission	Being a preferred business partner of international cement and concrete users.
2	AKENERJİ ELEKTRİK ÜRETİM A.Ş.	Vision	To maintain its leading position in the Turkish energy sector, and become one of the largest integrated companies that shape the industry.
		Mission	To make reliable and long-term contributions to Turkey's energy needs by operating with a quality-focused approach at every stage of the energy sector value chain.
3	ALARKO HOLDİNG A.Ş.	Vision	The main vision of the company is to become one of the leading companies worldwide in supplying Heating, Air Conditioning and Water Pressurizing products and rendering related services to international markets through the integrated efforts of its main partners, namely Alarko and Carrier.
		Mission	The company's main mission is to follow up the developments in products and services supplied to international markets and convert such developments into economical, competitive, reliable products and services rapidly, and to satisfy the expectations of our customers, employees and shareholders.
4	ALBARAKA TÜRK KATILIM BANKASI A.Ş.	Vision	To be the world's best participation bank.
		Mission	Committed to the principles of interest-free banking in accordance with our corporate values and the ethical principles of banking; to meet the financial needs of society by sharing our common benefits with customers, employees and shareholders who participate in our success.
5	ALCATEL LUCENT TELETAŞ TELEKOMÜNİK ASYON A.Ş.	Vision	To expand the human possibilities of the connected world
		Mission	Acting with uncompromising integrity, we work openly and collaboratively, seeking to earn respect from others
6	ANADOLU CAM SANAYİİ A.Ş.	Vision	While racing to the top as one of the leading companies in glass and our other business lines, we will become a global company that teams up with business partnersto deliver innovative solutions, that creates a difference distinguished with high-end technology and global brands that ensures great respect to individuals and environment.
		Mission	To be a company that adds value to life through its high-quality products offering comfort and that respects people, nature and the law.
7	AYEN ENERJİ A.Ş.	Vision	to convert natural and renewable sources into energy and bring them for the country's economy
		Mission	to undertake duties in the new energy investments that are required to be realized in our country and to finalize such undertaken duty with success

8	AYGAZ A.Ş.	Vision	To be the leading company providing energy solutions to Turkey and other potential markets, particularly in LPG and natural gas.
		Mission	To offer the best products and services in every field it operates, particularly in LPG, by prioritizing high quality and safety standards with working principles adopted from corporate values of the Koç Group and by always acting responsibly towards society and the environment.
9	BAGFAŞ BANDIRMA GÜBRE FABRİKALARI A.Ş.	Vision	to support local farmers and the nation's agriculture, by providing high quality products with the best possible price
		Mission	to continue being the preferable brand for the consumer by improving our company structure in sustainable ways and by achieving optimum customer satisfaction
10	BİM BİRLEŞİK MAĞAZALAR A.Ş.	Vision	acting on the vision to be an international company, continues to explore new potential market opportunities in the other countries
		Mission	BİM sustains trust-based relationships with its customers and suppliers as well as its stakeholders. It utilizes a flawless service philosophy embraced by all of its employees.
11	BİZİM TOPTAN SATIŞ MAĞAZALARI A.Ş.	Vision	To be Turkey's number one wholesaler in the fast-moving consumer goods sector, with its widespread, contemporary, and reliable concept.
		Mission	To be a strategic business partner that decreases costs and risks of its customers and suppliers, providing them with a competitive advantage.
12	BORUSAN MANNESMANN BORU SANAYİ VE TİCARET A.Ş.	Vision	To be a globally recognized, leading steel pipe company.
		Mission	Providing products and services that enhance the quality of life with our expertise in steel pipe industry and to promote the process of economic and social progress of our community.
13	ÇELEBİ HAVA SERVİSİ A.Ş.	Vision	With a team fully identified with the collective "Çelebi spirit", being an internationally leading and trustworthy company that creates changes in its sector and produces value for all stakeholders.
		Mission	Çelebi Ground Handling exists in order to make its expanding line of products and services available to larger groups while always remaining faithful to the Çelebi principles of quality, reliability, and business ethics.
14	ÇİMSA ÇİMENTO SANAYİ VE TİCARET A.Ş.	Vision	As a reliable business partner of our stakeholders, we provide the required materials for the living areas and infrastructures reaching to next generations.
		Mission	Çimsa is an international cement and building materials company continuously growing by creating a difference in the industry with an experience of more than 40 years, broad product range, innovative employees and a human and environment conscious approach. We meet the product and service needs of our customers in full and in a timely manner with our market oriented approach and wide distribution network.
15	DEVA HOLDİNG A.Ş.	Vision	To become the first choice by creating robust pharmaceutical brands in the areas we compete in.
		Mission	We exist to offer innovative and diversified rang of products with a high quality experience enabling healthy life opportunity to be available to everyone on a global scale.

16	EGE ENDÜSTRİ VE TİCARET A.Ş.	Vision	To be recognized in supplying premium quality level and innovative products on global basis.
		Mission	Adding value to customer business thru premium service and products. Meeting commitments and delivering quality service.
17	EİS ECZACIBAŞI İLAÇ, SINAİ VE FİNANSAL YATIRIMLAR SANAYİ VE TİCARET A.Ş.	Vision	Our Company shows utmost care to comply with the Capital Markets Legislation, BIST regulations, and the Corporate Governance Principles issued by the CMB in implementing its information policy.
		Mission	The Information Policy aims to share complete, fair, sound and comprehensive information concerning the Company's past performance, future expectations, strategies, objectives, vision and the knowledge base, excluding trade secrets; with the public, respective authorities, current and potential investors and shareholders equally, so that active and open communications preserved.
18	EMLAK KONUT GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş.	Vision	Maintain leader, primer and directive position in Domestic real-estate sector with developing corporate identity regularly, To be one of the leading international real-estate investment partnership with getting up planned, qualified and environment-friendly city planning perception higher and higher in International Criterions,
		Mission	As a leader and initiator of domestic real-estate sector with corporate identity to follow relevant domestic and international developments and innovations and lead real-estate sector, To create settlements with modern city-planning, planned, sufficient and environment-friendly idea and where people can live in peace and safety with giving importance to social values and consumer satisfaction, Care about personnel and shareholders` material and nonmaterial satisfaction,
19	ENKA İNŞAAT VE SANAYİ A.Ş.	Vision	To be one of the best and innovative engineering & construction companies serving globally.
		Mission	To design, build and deliver safe, high-quality and cost-effective construction projects on schedule for our customers while providing quality employment and career growth opportunities for ENKA Employees.
20	GOODYEAR LASTİKLERİ T.A.Ş.	Vision	Become a preferred tire manufacturer with high quality products
		Mission	To provide tire products and services that provide satisfaction beyond customer expectations through highly motivated employees in a safe and healthy working environment.

3. Research

Terms mission and vision published on the Official Web Sites of these firms were shown in a table.

Afterwards, these tables were investigated using NVIVO Qualitative research program. In this program, terms vision and mission were coded in the form of sentences under 3 main headings through a coding procedure. NODEs associated with the codes are as follows:

1. Economic Sustainability

2. Envorimental Sustainability

3. Social Sustainability

Table 4. Nvivo Codes of Bist 100 Index (20 Firms)

BIST 100 INDEX NVIVO CODES			
No	**Economic Sustainability**	**Environmental Sustainability**	**Social Sustainability**
	<Internals\\BIST100_20firm_vision_mission> - § 56 references coded [31,36% Coverage]	<Internals\\BIST100_20firm_vision_mission> - § 13 references coded [6,54% Coverage]	<Internals\\BIST100_20firm_vision_mission> - § 32 references coded [17,24% Coverage]
	Reference 1 - 0,46% Coverage	Reference 1 - 0,41% Coverage	Reference 1 - 0,56% Coverage
1	To become the most valuable cement and ready mixed concrete company in Turkey	To make reliable and long-term contributions to Turkey's energy needs	convert such developments into economical, competitive, reliable products and services rapidly,
	Reference 2 - 0,46% Coverage	Reference 2 - 0,56% Coverage	Reference 2 - 0,41% Coverage
2	Being a preferred business partner of international cement and concrete users	convert such developments into economical, competitive, reliable products and services rapidly,	satisfy the expectations of our customers, employees and shareholders
	Reference 3 - 0,37% Coverage	Reference 3 - 0,85% Coverage	Reference 3 - 0,78% Coverage
3	To maintain its leading position in the Turkish energy sector,	to meet the financial needs of society by sharing our common benefits with customers, employees and shareholders who participate in our success.	Committed to the principles of interest-free banking in accordance with our corporate values and the ethical principles of banking;
	Reference 4 - 0,42% Coverage	Reference 4 - 0,84% Coverage	Reference 4 - 0,85% Coverage
4	become one of the largest integrated companies that shape the industry.	that creates a difference distinguished with high-end technology and global brands that ensures great respect to individuals and environment.	to meet the financial needs of society by sharing our common benefits with customers, employees and shareholders who participate in our success.
	Reference 5 - 0,91% Coverage	Reference 5 - 0,11% Coverage	Reference 5 - 0,33% Coverage
5	The main vision of the company is to become one of the leading companies worldwide in supplying Heating, Air Conditioning and Water Pressurizing products	nature and the law.	To expand the human possibilities of the connected world

Reference 6 - 0,78% Coverage	Reference 6 - 0,31% Coverage	Reference 6 - 0,65% Coverage
6	rendering related services to international markets through the integrated efforts of its main partners, namely Alarko and Carrier.	to convert natural and renewable sources into energy	Acting with uncompromising integrity, we work openly and collaboratively, seeking to earn respect from others
	Reference 7 - 0,70% Coverage	Reference 7 - 0,87% Coverage	Reference 7 - 0,84% Coverage
7	The company's main mission is to follow up the developments in products and services supplied to international markets	to undertake duties in the new energy investments that are required to be realized in our country and to finalize such undertaken duty with success	that creates a difference distinguished with high-end technology and global brands that ensures great respect to individuals and environment.
	Reference 8 - 0,56% Coverage	Reference 8 - 0,37% Coverage	Reference 8 - 0,24% Coverage
8	convert such developments into economical, competitive, reliable products and services rapidly,	always acting responsibly towards society and the environment.	offering comfort and that respects people
	Reference 9 - 0,25% Coverage	Reference 9 - 0,31% Coverage	Reference 9 - 0,55% Coverage
9	To be the world's best participation bank.	to support local farmers and the nation's agriculture	to convert natural and renewable sources into energy and bring them for the country's economy
	Reference 10 - 0,78% Coverage	Reference 10 - 0,33% Coverage	Reference 10 - 0,37% Coverage
10	Committed to the principles of interest-free banking in accordance with our corporate values and the ethical principles of banking;	with its widespread, contemporary, and reliable concept.	always acting responsibly towards society and the environment.
	Reference 11 - 0,85% Coverage	Reference 11 - 0,62% Coverage	Reference 11 - 0,31% Coverage
11	to meet the financial needs of society by sharing our common benefits with customers, employees and shareholders who participate in our success.	we provide the required materials for the living areas and infrastructures reaching to next generations.	to support local farmers and the nation's agriculture
	Reference 12 - 0,56% Coverage	Reference 12 - 0,40% Coverage	Reference 12 - 0,58% Coverage
12	While racing to the top as one of the leading companies in glass and our other business lines,	innovative employees and a human and environment conscious approach.	improving our company structure in sustainable ways and by achieving optimum customer satisfaction
	Reference 13 - 0,59% Coverage	Reference 13 - 0,56% Coverage	Reference 13 - 0,59% Coverage
13	we will become a global company that teams up with business partnersto deliver innovative solutions,	qualified and environment-friendly city planning perception higher and higher in International	BİM sustains trust-based relationships with its customers and suppliers as well as its stakeholders
	Reference 14 - 0,84% Coverage		Reference 14 - 0,44% Coverage
14	that creates a difference distinguished with high-end technology and global brands that ensures great respect to individuals and environment.		It utilizes a flawless service philosophy embraced by all of its employees.

	Reference 15 - 0,43% Coverage		Reference 15 - 0,33% Coverage
15	To be a company that adds value to life through its high-quality products		with its widespread, contemporary, and reliable concept.
	Reference 16 - 0,87% Coverage		Reference 16 - 0,57% Coverage
16	to undertake duties in the new energy investments that are required to be realized in our country and to finalize such undertaken duty with success		To be a strategic business partner that decreases costs and risks of its customers and suppliers,
	Reference 17 - 0,37% Coverage		Reference 17 - 0,26% Coverage
17	To be the leading company providing energy solutions to Turkey		providing them with a competitive advantage.
	Reference 18 - 0,36% Coverage		Reference 18 - 0,87% Coverage
18	other potential markets, particularly in LPG and natural gas.		enhance the quality of life with our expertise in steel pipe industry and to promote the process of economic and social progress of our community.
	Reference 19 - 0,40% Coverage		Reference 19 - 0,33% Coverage
19	To offer the best products and services in every field it operates,		being an internationally leading and trustworthy company
	Reference 20 - 0,71% Coverage		Reference 20 - 0,41% Coverage
20	by prioritizing high quality and safety standards with working principles adopted from corporate values of theKoçGroup		creates changes in its sector and produces value for all stakeholders.
	Reference 21 - 0,37% Coverage		Reference 21 - 0,44% Coverage
21	by providing high quality products with the best possible price		always remaining faithful to the Çelebi principles of quality, reliability
	Reference 22 - 0,33% Coverage		Reference 22 - 0,30% Coverage
22	to continue being the preferable brand for the consumer		As a reliable business partner of our stakeholders,
	Reference 23 - 0,58% Coverage		Reference 23 - 0,62% Coverage
23	improving our company structure in sustainable ways and by achieving optimum customer satisfaction		we provide the required materials for the living areas and infrastructures reaching to next generations.
	Reference 24 - 0,31% Coverage		Reference 24 - 0,40% Coverage
24	acting on the vision to be an international company,		innovative employees and a human and environment conscious approach.
	Reference 25 - 0,46% Coverage		Reference 25 - 0,89% Coverage
25	continues to explore new potential market opportunities in the other countries		We meet the product and service needs of our customers in full and in a timely manner with our market oriented approach and wide distribution network.

	Reference 26 - 0,34% Coverage		Reference 26 - 0,47% Coverage
26	BİM sustains trust-based relationships with its customers		enabling healthy life opportunity to be available to everyone on a global scale.
	Reference 27 - 0,46% Coverage		Reference 27 - 0,30% Coverage
27	To be Turkey's number one wholesaler in the fast-moving consumer goods sector		Meeting commitments and delivering quality service.
	Reference 28 - 0,33% Coverage		Reference 28 - 0,57% Coverage
28	with its widespread, contemporary, and reliable concept.		with the public, respective authorities, current and potential investors and shareholders equally
	Reference 29 - 0,57% Coverage		Reference 29 - 0,24% Coverage
29	To be a strategic business partner that decreases costs and risks of its customers and suppliers,		active and open communications preserved.
	Reference 30 - 0,26% Coverage		Reference 30 - 1,25% Coverage
30	providing them with a competitive advantage.		To create settlements with modern city-planning, planned, sufficient and environment-friendly idea and where people can live in peace and safety with giving importance to social values and consumer satisfaction,
	Reference 31 - 0,17% Coverage		Reference 31 - 0,46% Coverage
31	To be a globally recognized,		Care about personnel and shareholders` material and nonmaterial satisfaction,
	Reference 32 - 0,16% Coverage		Reference 32 - 1,01% Coverage
32	leading steel pipe company.		To provide tire products and services that provide satisfaction beyond customer expectations through highly motivated employees in a safe and healthy working environment.
	Reference 33 - 0,18% Coverage		
33	Providing products and services		
	Reference 34 - 0,87% Coverage		
34	enhance the quality of life with our expertise in steel pipe industry and to promote the process of economic and social progress of our community.		
	Reference 35 - 0,33% Coverage		
35	being an internationally leading and trustworthy company		

	Reference 36 - 0,41% Coverage		
36	creates changes in its sector and produces value for all stakeholders.		
	Reference 37 - 0,69% Coverage		
37	Çelebi Ground Handling exists in order to make its expanding line of products and services available to larger groups		
	Reference 38 - 0,98% Coverage		
38	Çimsa is an international cement and building materials company continuously growing by creating a difference in the industry with an experience of more than 40 years		
	Reference 39 - 0,12% Coverage		
39	broad product range,		
	Reference 40 - 0,89% Coverage		
40	We meet the product and service needs of our customers in full and in a timely manner with our market oriented approach and wide distribution network.		
	Reference 41 - 0,56% Coverage		
41	To become the first choice by creating robust pharmaceutical brands in the areas we compete in.		
	Reference 42 - 0,55% Coverage		
42	We exist to offer innovative and diversified rang of products with a high quality experience		
	Reference 43 - 0,55% Coverage		
43	To be recognized in supplying premium quality level and innovative products on global basis.		
	Reference 44 - 0,40% Coverage		
44	Adding value to customer business thru premium service and products.		
	Reference 45 - 0,30% Coverage		
45	Meeting commitments and delivering quality service.		

	Reference 46 - 0,45% Coverage		
46	Our Company shows utmost care to comply with the Capital Markets Legislation		
	Reference 47 - 0,68% Coverage		
47	BIST regulations, and the Corporate Governance Principles issued by the CMB in implementing its information policy.		
	Reference 48 - 1,37% Coverage		
48	The Information Policy aims to share complete, fair, sound and comprehensive information concerning the Company's past performance, future expectations, strategies, objectives, vision and the knowledge base, excluding trade secrets;		
	Reference 49 - 0,73% Coverage		
49	Maintain leader, primer and directive position in Domestic real-estate sector with developing corporate identity regularly,		
	Reference 50 - 0,58% Coverage		
50	To be one of the leading international real-estate investment partnership with getting up planned,		
	Reference 51 - 0,56% Coverage		
51	qualified and environment-friendly city planning perception higher and higher in International		
	Reference 52 - 1,09% Coverage		
52	As a leader and initiator of domestic real-estate sector with corporate identity to follow relevant domestic and international developments and innovations and lead real-estate sector,		
	Reference 53 - 0,54% Coverage		
53	To be one of the best and innovative engineering & construction companies serving globally.		

	Reference 54 - 1,15% Coverage	
54	To design, build and deliver safe, high-quality and cost-effective construction projects on schedule for our customers while providing quality employment and career growth opportunities for ENKA	
	Reference 55 - 0,37% Coverage	
55	Become a preferred tire manufacturer with high quality products	
	Reference 56 - 1,01% Coverage	
56	To provide tire products and services that provide satisfaction beyond customer expectations through highly motivated employees in a safe and healthy working environment.	

Table 5. Nvivo Codes of Bist Sustainabilty Index (20 Firms)

BIST SUSTAINABILITY INDEX NVIVO CODES		
№ Economic Sustainability	Environmental Sustainability	Social Sustainability
<Internals\\BISTSUST_20firm_vision_mission> - § 40 references coded [14,78% Coverage]	<Internals\\BISTSUST_20firm_vision_mission> - § 14 references coded [4,73% Coverage]	<Internals\\BISTSUST_20firm_vision_mission> - § 53 references coded [16,77% Coverage]
Reference 1 - 0,02% Coverage	Reference 1 - 0,19% Coverage	Reference 1 - 0,16% Coverage
1 grow	most reliable power in the region	highly skilled human resource
Reference 2 - 0,10% Coverage	Reference 2 - 0,40% Coverage	Reference 2 - 0,52% Coverage
2 sustainable leader	efficient projects with our sensitivity for technological developments	educated staff, who continually renew themselves and operate at the highest level of quality
Reference 3 - 0,10% Coverage	Reference 3 - 0,49% Coverage	Reference 3 - 0,14% Coverage
3 brands responsibly	utilising the support of our extensive knowledge and experience in the energy industry	To bring people together
Reference 4 - 0,11% Coverage	Reference 4 - 0,06% Coverage	Reference 4 - 0,10% Coverage
4 to ensure profitable	environment	Respects the Globe
Reference 5 - 0,27% Coverage	Reference 5 - 0,18% Coverage	Reference 5 - 0,10% Coverage
5 to reach more consumers with INNOVATIVE products	innovative and reliable products	Respected Globally
Reference 6 - 0,20% Coverage	Reference 6 - 0,38% Coverage	Reference 6 - 0,14% Coverage
6 creating value in the global market	brand awareness and contributing to the technological independence	Corporate Sustainability

	Reference 7 - 0,38% Coverage	Reference 7 - 0,46% Coverage	Reference 7 - 0,03% Coverage
7	brand awareness and contributing to the technological independence	Employing creative and innovative workforce, and making good use of technologies,	People
	Reference 8 - 0,27% Coverage	Reference 8 - 0,18% Coverage	Reference 8 - 0,38% Coverage
8	continue achieving sustainable, quality growth.	Attracting and Developing Talent	brand awareness and contributing to the technological independence
	Reference 9 - 0,41% Coverage	Reference 9 - 0,47% Coverage	Reference 9 - 0,14% Coverage
9	serves as the standard against which we weigh our actions and decisions.	Providing innovative automotive products and services beneficial to the community.	The Business family Model
	Reference 10 - 0,31% Coverage	Reference 10 - 0,19% Coverage	Reference 10 - 0,20% Coverage
10	Being well-informed about the industry and the market,	Is to be the best bank in Europe.	fundamental responsibility examples
	Reference 11 - 0,46% Coverage	Reference 11 - 0,46% Coverage	Reference 11 - 0,13% Coverage
11	Employing creative and innovative workforce, and making good use of technologies,	Is to continuously and noticeably increase the value we create for our customers,	performance indicators
	Reference 12 - 0,49% Coverage	Reference 12 - 0,56% Coverage	Reference 12 - 0,24% Coverage
12	Providing productive and profitable services across the entire automotive value chain.	the society and the environment by utilizing our influence, agility and organizational efficiency.	knowledge/skill/experience and competences
	Reference 13 - 0,09% Coverage	Reference 13 - 0,55% Coverage	Reference 13 - 0,53% Coverage
13	A Valuable Brand	we create a work environment which nourishes increased productivity, cooperation, and solidarity.	our remuneration policy is based on an objective system relying on our Business Family Model.
	Reference 14 - 0,24% Coverage	Reference 14 - 0,17% Coverage	Reference 14 - 0,13% Coverage
14	A Well-Known, Reputable and Admired Company	community, and the environment	transparency in society
	Reference 15 - 0,18% Coverage		Reference 15 - 0,28% Coverage
15	Attracting and Developing Talent		economic welfare and stability of the individual.
	Reference 16 - 0,13% Coverage		Reference 16 - 0,69% Coverage
16	A Global Point of View		develop and implement stateof- the art commercial and technological applications in consumer-facing products and services
	Reference 17 - 0,15% Coverage		Reference 17 - 0,77% Coverage
17	A Unique Production System		establish the institutional facilities and capabilities necessary for the effective execution of these efforts in Turkey and the region.
	Reference 18 - 0,14% Coverage		Reference 18 - 0,38% Coverage
18	Lean, Flexible and Agile		provide creative and innovative services that surpass expectations

	Reference 19 - 0,14% Coverage		Reference 19 - 0,38% Coverage
19	A Strong Financial Basis		Operating with a focus on achieving ultimate customer satisfaction,
	Reference 20 - 0,19% Coverage		Reference 20 - 0,73% Coverage
20	A Strong Commitment to Innovation		Understanding what its stakeholders expect, defining further expectations and seeking to meet them all with maximum satisfaction,
	Reference 21 - 0,38% Coverage		Reference 21 - 0,46% Coverage
21	Being Turkey's most valuable and most preferred industrial company.		Employing creative and innovative workforce, and making good use of Technologies.
	Reference 22 - 0,47% Coverage		Reference 22 - 0,17% Coverage
22	Providing innovative automotive products and services beneficial to the community.		Being reliable and trustworthy
	Reference 23 - 0,19% Coverage		Reference 23 - 0,14% Coverage
23	Is to be the best bank in Europe.		Happy and Loyal Employees
	Reference 24 - 0,46% Coverage		Reference 24 - 0,18% Coverage
24	Is to continuously and noticeably increase the value we create for our customers,		Attracting and Developing Talent
	Reference 25 - 0,39% Coverage		Reference 25 - 0,17% Coverage
25	Global Investment Holdings aims to become a leader in its operations,		Shaping the Needs of Customers
	Reference 26 - 0,84% Coverage		Reference 26 - 0,26% Coverage
26	to initiate new and innovative projects with growth potential and to become a pioneer in developing and evolving the business environment in Turkey.		Respecting Society, Humans and the Environment
	Reference 27 - 1,10% Coverage		Reference 27 - 0,47% Coverage
27	The Holding is committed to developing portfolio of competitive companies, within the sectors in which it operates, with strong and healthy growth prospects in conformity with global standards.		Providing innovative automotive products and services beneficial to the community.
	Reference 28 - 1,38% Coverage		Reference 28 - 0,19% Coverage
28	The Holding is also responsible for updating strategies for its subsidiaries, along the lines of the changing local and global environment, as to ensure their quick adaptations to changing business conditions and help their continuous growth.		Is to be the best bank in Europe.

	Reference 29 - 0,10% Coverage		Reference 29 - 0,46% Coverage
29	The most preferred		Is to continuously and noticeably increase the value we create for our customers,
	Reference 30 - 0,32% Coverage		Reference 30 - 0,07% Coverage
30	To be the most preferred bank in Turkey for the customers		shareholders,
	Reference 31 - 0,34% Coverage		Reference 31 - 0,05% Coverage
31	and providing opportunities for development and advancement.		employees
	Reference 32 - 0,38% Coverage		Reference 32 - 0,56% Coverage
32	Agile Kordsa Global in High Value Businesses for Sustainable Growth		the society and the environment by utilizing our influence, agility and organizational efficiency.
	Reference 33 - 0,35% Coverage		Reference 33 - 0,06% Coverage
33	To deliver high value-added reinforcement solutions, globally.		trustworthy
	Reference 34 - 0,73% Coverage		Reference 34 - 0,96% Coverage
34	a strategy of pursuing expansion both in its own and in neighboring national markets and always exceeding customer expectations.		To be the most preferred bank in Turkey for the customers, shareholders and employees, by maintaining our position as the leading, pioneering and most trustworthy bank.
	Reference 35 - 0,43% Coverage		Reference 35 - 0,92% Coverage
35	to maintain its sectoral leadership in growth and operational profitability		We, Koç Group, with all our people, aspire to ensure customer satisfaction and sound growth by providing products and services of universal quality and standards
	Reference 36 - 0,63% Coverage		Reference 36 - 0,88% Coverage
36	Otokar preserves the local and national characteristics of its products by developing its technology in- house		We are committed to being a symbol of trust, continuity and esteem for all our stakeholders: our country, customers, shareholders, dealers, and suppliers.
	Reference 37 - 0,75% Coverage		Reference 37 - 0,44% Coverage
37	The key mission of Otokar is to design, manufacture, and market commercial vehicles and various defence industry products developed		The quality of our products and services is based on the quality of our people
	Reference 38 - 0,66% Coverage		Reference 38 - 0,47% Coverage
38	To be the leading low-cost airline in our region with our innovative, rational, principled and responsible approach.		For the continuity of Koç Group, we follow a policy of recruiting the best people,

	Reference 39 - 0,24% Coverage	Reference 39 - 0,39% Coverage
39	Our leadership criteria: numbers of guests,	To fully utilize the talents, strength, and creativity of our people
	Reference 40 - 0,26% Coverage	Reference 40 - 0,55% Coverage
40	We believe that everybody has the right to fly	we create a work environment which nourishes increased productivity, cooperation, and solidarity.
41		Reference 41 - 0,36% Coverage
		To be an organized retailer who remains the closest to customers
42		Reference 42 - 0,42% Coverage
		To play a leading role in improving the quality of life at home and abroad
43		Reference 43 - 0,31% Coverage
		as innovative and productive as it is customer-focused
44		Reference 44 - 0,04% Coverage
		trusted
45		Reference 45 - 0,10% Coverage
		mindful of people
46		Reference 46 - 0,34% Coverage
		to generate long-term, satisfying returns for its employees
47		Reference 47 - 0,10% Coverage
		business partners
48		Reference 48 - 0,07% Coverage
		shareholders
49		Reference 49 - 0,29% Coverage
		aims at the continued satisfaction of its customers
50		Reference 50 - 0,05% Coverage
		employees
51		Reference 51 - 0,07% Coverage
		shareholders
52		Reference 52 - 0,40% Coverage
		in line with customer expectations that have global competitive power.
53		Reference 53 - 0,21% Coverage
		our response to customer expectations

These Nodes were created taking into consideration in the phrases of the firms, not in the form of a word scan.

The results of this study with NVIVO codes are given in the following tables.

Table 6. Nvivo Outputs of Bist Sustainability Index (20 Firms)

BISTSUSTAINABILITY INDICE

Nodes	References	Sources
Economic Sustainability	40	20
Environmental Sustainability	14	20
Social Sustainability	53	20
Total	**107**	**20**

Table 7. Nvivo Outputs of Bist 100 Index (20 Firms)

BIST100 INDICE

Nodes	References	Sources
Economic Sustainability	56	20
Environmental Sustainability	13	20
Social Sustainability	32	20
Total	**101**	**20**

4. Conclusion

This study aimed to observe sustainability performance of enterprises in BIST Sustainability Index.

As a result of this research, companies in BIST Sustainability Index, within the mission and vision expressions, Social Sustainability frequencies are more than Economic Sustainability frequencies. From this result, we can conclude that companies in Bist Sustainability Index give more importance to Social Sustainability than Economic Sustainability. In our study, companies in BIST 100 Index, within the mission and vision expressions, Economic Sustainability frequencies are more than Social Sustainability frequencies. From this result, we can conclude that companies in Bist 100 Index give more importance to Economic sustainability than Social Sustainability. And also companies in BIST sustainability index have used social sustainability studies more in their mission and vision statements. So Social Sustainability is more important for Bist Sustainability firms.

The unexpected output of our research has emerged in the analysis of the concept of Environmental Sustainability. In environmental sustainability, we expected that companies in the BIST sustainability index would have more frequency. The frequencies are almost equal (14,13). It can be said from this output that the indices have no effect in terms of Environmental Sustainability when expressing themselves. For more specific outputs can be obtained from our study, the research can be made on sectorel basis. Our research can be improved by entering the qualitative method with business visits and by making the NODs generated in codification more detailed. If there was more time for our research, more comprehensive and specific results could be achieved.

The study has revealed that the importance of the sustainability in Turkey and the fact that the enterprises were on this index, enough effort is being made. This paper suggests to apply BIST Sustainability Index to all enterprises in Borsa Istanbul. We believe that the sustainability indices like BIST Sustainability Index will support to enterprises to make enough efforts on sustainability.

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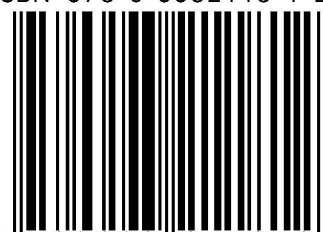Otokar, (22.11.2016), https://www.otokar.com.tr/tr-tr/Sayfalar/default.aspx

Social and Economic Perspectives on Sustainability

The term "Sustainability" possesses numerous meanings for different people and various circumstances and it is a common mistake to define sustainability strictly in terms of "environmental sustainability". This misconception believes the major flaw of the contemporary pattern of development is simply its destruction of the environment. Handling "sustainability" only from an environmental standpoint is a superficial view that needs to be assessed carefully and underlined correctly. As A. D. Basiago suggests, "…[t]he protection of natural systems represents not an overarching panacea for achieving economic vitality and social justice, but a necessary component of an entire system for achieving economic, social and environmental 'sustainability', in which economic reforms and social reforms are as important."

The chapters included in this volume are composed of some selected significant contributions from the first International Sustainability Congress organized by International Center of Sustainability (ICS), 1-3 December 2016, in Istanbul, Turkey. All chapters are peer-reviewed by both the editors and at least two independent scholars from fields relevant to the manuscript's subject area. ICS is a research and academic center for sustainability founded in 2015 and dedicated to build resilience of communities and ecosystems to environmental and socio-economic risks. ICS has an integrated approach and specifies sustainability not only from an environmental point of view but also in terms of socio-economic process. Its mission is to produce information as well as enhance research and practice at Micro and Macro levels in Sustainable Development with a holistic and a cross-disciplinary approach.