UNIVERSITÀ DEGLI STUDI DI URBINO CARLO BO

Department of Economics, Society, Politics (DESP)

Ph.D. Programme in Global Studies, Economy, Society and Law

Thematic area: International Economic Policy, Business and Governance

Cycle XXXIII

DESIGN FOR INNOVATION AND COMPETITIVENESS: NEW OPPORTUNITIES IN THE FURNITURE SECTOR

SSD: SECS-P/08

Supervisor

Professor Elisabetta Savelli

Ph.D. Candidate

Marica Barbaritano

Academic Year 2019/2020

Alla mia famiglia, a cui devo tutto.

A Salvatore, amore mio grande.

ABSTRACT

The purpose of this thesis is to understand whether and how design can be still considered as a source of innovation and competitiveness during the current and in the future economic scenario, characterised by increasing uncertainties and complexities. In this context, indeed, the connotation and the role of design have deeply changed, and the basic principles of design management have been gradually revised. Starting from the assumption that consumers and companies are increasingly concerned with sustainability and environmental issues, the role of design has been analysed, in this study, through the lens of the circular economy paradigm, which provides a broader connotation of design and suggests new opportunities for its management. The focus is on the furniture industry, on which literature still deserves further investigation on the above topics.

A mixed-method approach has been adopted: a qualitative research has been developed to investigate the companies' perspective, while a quantitative method was preferred to consider consumers' view. The findings of the qualitative study revealed a significant awareness of furniture companies about the concept of circular economy and eco-design practices. Nevertheless, they are still little involved in the current implementation of these practices, thus revealing a potential attitude-behaviour gap, which deserved further investigation. In this regard, the analysis of the development process of an eco-design innovation within a family firm context revealed the effectiveness of eco-design practices for producing innovative design furniture objects. The consumers' perspective was also considered in the second step of the study. The results provided a better understanding of the effects of consumers' perception of design attributes on their decision-making and purchasing processes, by focusing on its constitutive three dimensions (i.e. functional, aesthetic and symbolic). Moreover, the effects of environmental concerns on consumers' attitudes and beliefs towards the purchase of design furniture products were investigated.

Overall, several interesting theoretical and practical implications emerged, while some limitations of this study provided useful suggestions for future research.

RIASSUNTO

Lo scopo di questa tesi è di capire se e come il design possa essere ancora considerato fonte di innovazione e di vantaggio competitivo nell'attuale scenario economico ed in quello futuro, caratterizzato da crescenti incertezze e complessità. In questo contesto, infatti, la connotazione e il ruolo del design hanno subìto profondi cambiamenti e i principi alla base del *design management* sono stati progressivamente rivisti. Partendo dal presupposto che i consumatori e le aziende sono sempre più attenti ai temi della sostenibilità e dell'ambiente, il ruolo del design è stato analizzato, in questo lavoro, assumendo il paradigma dell'economia circolare, il quale fornisce una connotazione più ampia del concetto di design e suggerisce nuove opportunità per la sua gestione. Il focus è stato posto sul settore del mobile, su cui la letteratura rivela ancora molte possibilità di approfondimento in merito alle suddette tematiche.

Sotto il profilo metodologico, è stato adottato un approccio misto basato su uno studio qualitativo volto ad indagare la prospettiva delle aziende ed un'analisi quantitativa tesa ad approfondire il punto di vista dei consumatori. I risultati della prima fase di questa ricerca hanno rivelato una significativa consapevolezza delle aziende del settore del mobile relativamente al concetto di economia circolare e alle pratiche di eco-design. Tuttavia, le stesse risultano ancora poco coinvolte nell'implementazione di tali pratiche, rivelando l'esistenza di un potenziale gap attitudo-comportamentale meritevole di ulteriori approfondimenti. A tal proposito, l'analisi approfondita delle pratiche di eco-design applicate in uno specifico contesto aziendale si è rivelata particolarmente efficace per dimostrare le potenzialità innovative legate ai principi della sostenibilità e del rispetto ambientale nella realizzazione di nuovi oggetti di arredamento. Nel considerare, invece, la prospettiva dei consumatori, sono emerse indicazioni interessanti che hanno permesso di comprendere meglio gli effetti della percezione del design sui processi decisionali e di acquisto, distinguendo i diversi attributi in tre dimensioni fondamentali che definiscono la natura funzionale, estetica e simbolica del design stesso. Inoltre, sono stati analizzati gli effetti che una diversa consapevolezza del consumatore in merito alle problematiche ambientali può generare sul suo atteggiamento e sulla sua intenzione di acquisto di un oggetto di design.

I due step della ricerca hanno permesso di individuare Interessanti implicazioni teoriche e manageriali. Peraltro, la considerazione di alcuni limiti dello studio, legati principalmente ad aspetti metodologi, ha fornito utili suggerimenti per proseguire ed impostare i futuri sentieri di ricerca.

ACKNOWLEDGEMENT

First and foremost, I would like to express my deep and sincere gratitude to my academic supervisor, Professor Elisabetta Savelli for her invaluable guidance throughout this research and for her continuous support and patience. Her dynamism, sincerity and vision have inspired me throughout all this period. I am extremely grateful for what she taught me.
My gratitude also goes to Mr. Daniele Livi and his company team for the opportunity they gave me.

I must express my very profound gratitude to my love, Salvatore, for the continuous motivation, encouragement, support, patience and for the inspiration he provided me, day by day.
I would like also to say thanks to my friends and research colleagues Alessandro, Elisa, Giorgia, Ida, Mariachiara, Sara, and Silvia for the beautiful moments we shared and for the continuous support during these three years. A special thanks goes to Simona, for the organisational and technical support provided during the teaching and research activities.

Last, but not least, I would like to thank my mother and my brother for supporting me during this period. I am extremely grateful to my mother for her love, prayers, caring and sacrifices.

Finally, my thanks go to all the people who have supported me to complete the research work directly or indirectly.

This accomplishment would not have been possible without them.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Over the time, several scholars investigated the concept of design with the aim to identify a commonly accepted definition (Simon, 1969; Krippendorff, 1989; March and Smith, 1995; d'Ippolito, 2014). While in the past the term was mainly associated to the aesthetic and stylistic dimensions of a product (Holt, 2015), nowadays its connotation is broadening by incorporating several immaterial aspects (Eisenman, 2017; Rocha et al., 2019). Along with its conceptual advancements, design management has also increased its strategic relevance over the years (Cooper et al., 2016; Ughanwa and Baker, 2018) being recognized as a source of innovation and competitive advantage for companies operating in different sectors (d'Ippolito, 2014; Press and Cooper, 2017). Nevertheless, the theoretical debate surrounding this topic is still open and controversial (Peschl and Fundneider, 2016), especially in light of the emerging socio-economic and technological changes.

The current scenario, indeed, is characterised by increasing uncertainties. The wider competition and liberalisation of markets, the gradual process of design democratization, the development of Internet and new technologies, and the evolving trends in consumption patterns have encouraged companies to find new ways for differentiation (Ferreira et al., 2017; Ortiz-Villajos and Sotoca, 2018) by gradually shifting towards intangible features of products (Ceschin and Gaziulusoy, 2016; Flach and Irlacher, 2018). Moreover, in recent years, the traditional economic system – based on the paradigm "take, make and dispose" – has been increasingly questioned for its negative consequences in terms of global warming, biodiversity destruction, and resource depletion that are threatening humanity's survival. Therefore, a number of studies (Harmon and Fairfield, 2014; Watkins et al., 2016; Fagerlind et al., 2019) pointed out how the increasing relevance of sustainable issues for companies, consumers, and institutions is leading companies to move towards the implementation of new business models and practices with a lower environmental impact.

In this context, Rusten and Bryson (2010) demonstrated that design - as an intangible asset - could play a crucial role in companies' innovativeness. In particular, the crucial role of eco-design, which can be also used in order to reduce the environmental impact of a product, rapidly emerged and established (MacArthur, 2013; Prendeville et al., 2014; Lieder and Rashid, 2016). These assumptions have not yet been verified on a large scale and deserve further investigation when applied to specific industrial settings, such as the furniture one, on which this study pays its attention. Furniture companies are worthy of analysis since they are

intensively involved in design innovation, especially within the Italian context (Vickery et al., 1997). Moreover, they are particularly relevant from an environmental standpoint, given their large use of virgin raw materials and industrial supplies (i.e., adhesives, dyes, solvents, and coatings), which results in great volume of volatile organic compound and waste production (Azizi et al., 2016).

To the best of the author's knowledge, there is a lack of contributions examining the concept of circular economy and eco-design among furniture companies. In particular, despite the large body of literature on innovation and sustainability in large businesses, few attention has been devoted to small firms (Bos-Brouwers, 2010), thus the relationship between small furniture companies, eco-design innovation, and circularity remains an interesting topic for both theoretical and managerial investigations.

The above observations have turned out to be a good starting point for the present study, aimed at identifying new management strategies which can be used by design-based furniture companies to improve their competitive and innovative performances, during the current and in the future economic scenario.

After considering the companies' perspective, the consumers' standpoint was also analysed in this study. The design, indeed, can differently affect consumers' perceptions and behaviours (Noble and Kumar 2010; Bloch, 2011), also in light of its three-dimensional conceptualisation, including aesthetic, functional and symbolic attributes (Bloch, 2011; Srinivasan et al., 2012; Homburg et al., 2015). Nevertheless, no empirical evidence has been found on the relationship between design attributes and consumers' perception and behaviour with specific regard to the furniture sector, while it could be particularly helpful for an effective design management. Hence, a further aim of this study was to investigate how consumers perceive the concept of design and its effects on their purchasing decisions. This could provide useful insights for companies to identify the main factors on which they should focus for attracting consumers and for satisfying their needs.

A final consideration concerns the increasing attention towards sustainability and environmental issues by consumers (Skogen et al., 2018). Different design attributes could be a source of concern for environmentally involved consumers, especially in the furniture industry, where manufacturing processes require the use of a considerable amount of raw (e.g., wood, metals, etc.) and industrial materials (e.g., plastic, solvents, etc.). In this respect, it was

worthy to investigate whether and how consumers' awareness about sustainable and environmental issues could influence their attitudes and beliefs towards the purchase of design furniture products. By doing so, practical implications could be derived for furniture companies to understand the economic convenience of investing in environmental strategies and eco-design practices, in order to improve their overall competitiveness.

To achieve the overall purpose of this study, the research method has been developed through both deductive and inductive approaches (see *Chapter 3*).
The first one was based on an in-depth analysis of the extant literature concerning the topics of design, innovation, circular economy, eco-design, and their relationships (see *Chapters 1* and *2*). The inductive method was based on the analysis of significant research cases by adopting a qualitative approach (see *Chapters 4* and *5*). A quantitative study was further developed in order to consider the consumers' perspective (see *Chapter 6*).
Table 0.1 operationalizes the research questions of this thesis, along with their related hypotheses and procedures.

Table 0.1 - Summary of the research questions and hypotheses

Research Questions	*Procedure*
RQ1: How are furniture companies moving towards the adoption of circular and eco-design approaches?	*First qualitative study:* The design-based industry and Circular Economy. How does it work in the Italian furniture sector?
RQ2: Can sustainability be considered as a design innovation tool in supporting companies' competitiveness?	*Second qualitative study:* Design and sustainability for innovation. Evidence of eco-design practices from a family firm.
RQ3: How do consumers perceive the different dimensions (functional, aesthetic, and symbolic) of design? Which attributes most affect their perception?	*The quantitative study (online/offline survey):* Consumers' perception of design and factors affecting their purchasing intention.
RQ4: To that extent the design attributes (i.e. functional, aesthetic, symbolic) impact on consumers' purchasing intention?	It has been converted into the following hypotheses: H1: The perception of design attributes positively influences the purchasing intention of design furniture products. H1.1: The symbolic dimension of a design furniture product positively influences the purchasing intention of consumers more than the aesthetic and functional dimensions do. *(Factor analysis and regression analysis)*
RQ5: To what extent consumers' environmental concerns influence their purchasing intention of design furniture products?	It has been converted into the following hypotheses:

	H2: Consumers' environmental concerns negatively affect the purchasing intention of design furniture products. H3: Consumers' environmental concerns moderate the positive relationship between design attributes (i.e., functional, aesthetic, and symbolic) and purchasing intention. *(Structural equation model)*

Source: personal elaboration.

The thesis is composed of seven chapters (see Figure 0.1), which are described below:

Chapter 1 retraces and discusses some definitions of the design concept provided over the last decades. The chapter also investigates how the role of design has evolved by gaining increasing strategic relevance. Moreover, the main benefits of design, including innovation and competitive advantage, are discussed. Lastly, a summary of the initiatives recently promoted by the European Commission in order to support companies' investments in design and related activities is provided.

Chapter 2 offers an in-depth investigation of the main changes resulting from the economic crisis occurred in 2008, which led to new expectations, values, and behaviours both from companies and consumers' perspectives. In light of these changes, new design management strategies are analysed, while discussing how the relationships between design, innovation, and competitiveness are changing. More specifically, this chapter focuses on the growing adoption of sustainable strategies by companies, which is leading to new business models, including the circular economy and eco-design approaches. A general discussion on the different strategies that can be adopted, and the main related benefits, concludes the First Section of the thesis titled "Design and sustainability: a possible relationship".

Chapter 3 focuses on the research methodology along with the research approaches used for data collection, case-studies, samples selection, and data analysis processes. The chapter also provides explanations about the double research phases developed in this study, and discusses the main rationales underlying them. A brief discussion of some ethical issues concludes the chapter.

Chapter 4 analyses the role of design for companies' competitiveness through the circular economy paradigm. In more detail, the chapter offers a better understanding of the extent to which the principles of circular economy, and more specifically the eco-design practices, are currently implemented within furniture companies (RQ1). The results of the first qualitative research, based on the analysis of multiple case-studies are, then, described and discussed.
Several parts of this Chapter are drawn from an article published in 2019 by the international journal *Sustainability* titled *"Sustainability and quality management in the Italian luxury furniture sector: A circular economy perspective"* co-authored by Laura Bravi, Elisabetta Savelli, and me [1].

In light of the increasing importance of environmental and sustainable issues, *Chapter 5* discusses the need for redefining the design concept with the aim to identify plausible pathways for relaunching companies' competitiveness in the current scenario. More specifically, based on an in-depth investigation of a single case study, the chapter provides interesting findings concerning the implementation of environmental strategies for developing new design furniture products. In this sense, results show that sustainable strategies and eco-design methods can be successfully adopted to support companies' competitiveness (RQ2).
The main contents of this Chapter are drawn from a paper recently published by the Italian journal *Piccola Impresa/Small Business* titled "*Design and sustainability for innovation in family firms. A case study from the Italian furniture sector"* co-authored by Elisabetta Savelli and me[2].

Chapter 6 moves on the consumers' perspective by investigating the role of design in their decision-making and purchasing processes. Based on a quantitative study carried out on a sample of 350 Italian respondents, the chapter analyses the ways through which design is perceived by consumers (RQ3), and to what extent it impacts on their buying intention (RQ4), by focusing on its three constitutive dimensions (i.e., functional, aesthetic, and symbolic) (Homburg et al., 2015). The chapter also investigates the effects of consumers' environmental concerns on their willingness to purchase design furniture products (RQ5). A discussion on the main theoretical and managerial implications, which could be particularly helpful for

[1]Barbaritano, M., Bravi, L., & Savelli, E. (2019). Sustainability and quality management in the Italian luxury furniture sector: A circular economy perspective. *Sustainability, 11(11), 3089*.
[2]Barbaritano, M., & Savelli, E. (2020). Design and sustainability for innovation in family firms. A case study from the Italian furniture sector. *Piccola Impresa/Small Business*, (1).

companies, concludes the chapter. The preliminary results of this study have been recently presented at the XVII SIM Conference *Marketing for a better society* (October 28-30th, 2020) with a contribution titled "*How environmental concerns affect the relationship between design attributes and purchasing intention*" co-authored by Elisabetta Savelli and me[3].

Finally, *Chapter 7* presents an overall discussion of the findings and deals with several implications for management. The main contributions of the thesis are presented, while a number of limitations are considered and several proposals for future research directions are proposed. This final chapter concludes the second Section of the thesis titled "Research methods and findings".

Overall, from a theoretical standpoint, the present thesis offers three main contributions to the extant literature on design management within furniture companies. Firstly, it improves the existing knowledge on circular economy principles within the furniture setting, on which very little attention has been devoted by prior research. In fact, extant studies are still sparse, since they investigated the role of eco-design (e.g., Addis and Schouten, 2004; González-García et al., 2011; Mirabella et al., 2014), the increasing use of recycling raw materials and the growing adoption of renewable energy, as different matters of Circular Economy, without considering other practices, such as the recovery/reconversion of waste materials to create new products (Yuan et al., 2006). The present study provides a valuable contribution to filling this gap, even though the adoption of a qualitative approach (see *Chapter 4*) requires a lot of caution in order to avoid any generalisation of the results.

Secondly, this study contributes to the current debate on innovation in furniture firms, especially concerning the small firm context. By observing the development of the DV Glass® project (see *Chapter 5*), the research explains how the innovation process is carried out by a family firm, confirms the critical role of the ownership, and reveals several opportunities of open innovation practices for the success of companies' innovation. Moreover, this study adds knowledge to prior research by providing evidence that environmental sustainability can be

[3]Barbaritano, M., & Savelli, E. (2020). "How environmental concerns affect the relationship between design attributes and purchasing intention". XVII Convegno Annuale della Società Italiana Marketing, *Il Marketing per una società migliore*, October 28-30th, 2020.

considered by furniture companies as an innovative force generating new products and processes.

Finally, from the market perspective, the research provides a deeper understanding of the relationships between design, consumers' attitudes and purchasing intentions of furniture products (see *Chapter 6*). Notably, it focuses on different dimensions of design by providing a pioneer attempt of applying the original classification proposed by Homburg and colleagues (2015) in the furniture sector. Moreover, it investigates the effects of consumers' environmental concern on the relationship between design and purchasing intention of design furniture products. Concluding, it suggests several implications for furniture managers willing to invest in design attributes in order to improve their companies' innovation and long-term competitiveness.

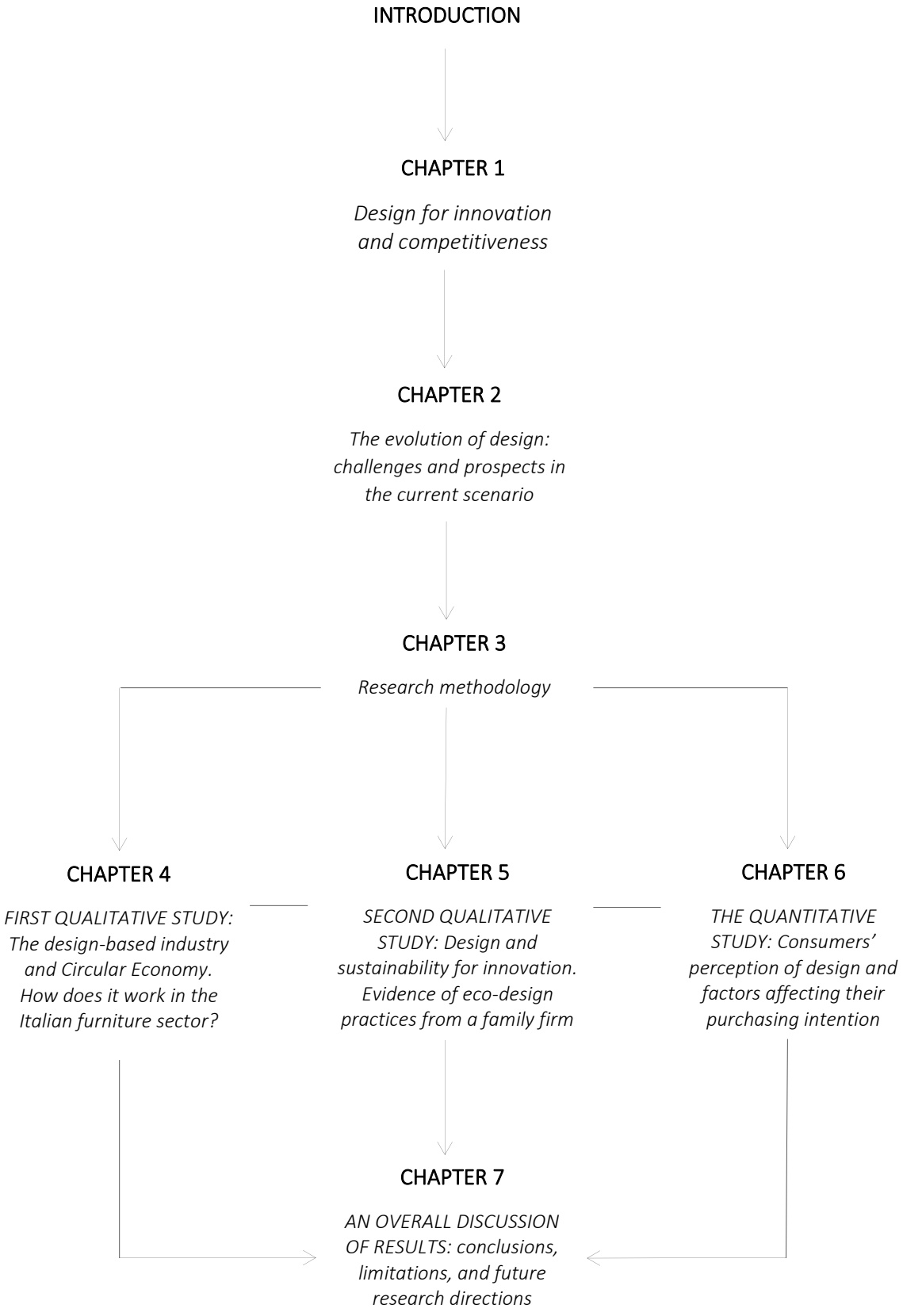

Figure 0.1 – Structure of the thesis

Source: personal elaboration.

SECTION 1

DESIGN AND SUSTAINABILITY: A POSSIBLE RELATIONSHIP

CHAPTER 1 – DESIGN FOR INNOVATION AND COMPETITIVENESS

CHAPTER 2 – THE EVOLUTION OF DESIGN: CHALLENGES AND PROSPECTS IN THE CURRENT SCENARIO

CHAPTER 1

DESIGN FOR INNOVATION AND COMPETITIVENESS

1.1 THE CONCEPT OF DESIGN

The concept of design has always received a lot of attention both in academic and managerial fields, given its economic, social, and ethical impact (Bhamra and Lofthouse, 2016; Ughanwa and Baker, 2018). Although several scholars attempted to provide a precise and concise definition of this concept, the theoretical debate is still open and controversial, as it involves different aspects (Peschl and Fundneider, 2016).

These efforts are complex in nature, mainly because the conceptualisation of the term "design" goes beyond the mere interpretation and contextualization of the term "project", to which the first is often associated; this latter, indeed, refers to practical operations which led to the conception and subsequent realisation of an object (Vial, 2017). In addition, this kind of conceptualisation appears to be too much restrictive, since it is not able to fully grasp the many factors that distinguish its meaning in the different contexts in which design occurs, such as historical, social, technological, geographical, ethical, and economic ones.

Hence, the main aim of this section is to provide a common thread of analysis between the different factors which can affect the conceptualisation of the term "design", in order to facilitate the readers' understanding of this current and complex topic.

1.1.1 The etymological meaning of design

In the late 80s, Krippendorff (1989, p.9) claimed that: "the etymology of design goes back to the Latin *de + signare* and means making something, distinguishing it by a sign, giving it significance, designing its relation to other things, owners, users or goods". This conceptualisation has been accepted in further studies, until recent years (Peschl and Fundneider, 2016; De Goey et al., 2017). Notably, in the design-related context, two other relevant words have been often associated with the term "design", i.e. *machine* and *technology* (Flusser, 2013). The first one comes from Greek *méchos*, which indicates a device conceived to deceive the mind. In turn, the original root of this term derives from Greek *magh* - similar to the German terms *macht* and *mögen* - which respectively mean "power" and "want". On the

other side, the term *technology* has its etymological origin from Greek *téchne*, which means "art" and it is strictly related to another Greek word, *tékton*, which indicates the carpenter, an artisan whose ability is to realize an artefact by transforming a raw material, like wood. Similarly, the Latin equivalent term of *téchne* is *ars*, whose diminutive is *articulum* and indicates something that turns around the hand. This takes us to the English term *art*, which refers to the ability to turn something to one's advantage; an activity very close to what the craftsman effectively does, which consists in combining different elements with the aim to realize something for a specific purpose.

As pointed out by Flusser (2013, pp. 18-19), "the words *design, machine, technology* and *art* are closely related to one another, one term being unthinkable without the others, and they all derive from the same existential view of the world. However, this internal connection has been denied for centuries, at least since Renaissance. Modern bourgeois culture made a sharp division between the world of the arts and that of technology and machines; hence, culture was split into two mutually exclusive branches: one scientific that is quantifiable and the other, which relates to the aesthetic. This unfortunate split started to become irreversible towards the end of the nineteenth century and in the gap between the two, the word design formed a bridge. It could do this since it is an expression of the internal connection between art and technology. Here, in contemporary life, design more or less indicates the site where art and technology (…) come together as equals, making a new form of culture possible."

Therefore, a deeper analysis of the contextual situations which led to the development of the design concept is crucial in order to better understand the above evolution over time.

1.1.2 The evolution of design over time

Although the concept of design is closely related to the terms *machine* and *technology*, it cannot be intended as a mere engineering practice, as demonstrated by its ancient origins.

During the 18th century, the Industrial Revolution marked the birth of design as a specialist practice, well distinguished from mass production, as well as from art and craftsmanship (Wilhide, 2016). In the course of the Great Exhibition at the Crystal Palace (London, May-October 1851), six million visitors took part in what international magazines defined as the forerunner event of a World's Fair (McNamara, 2019)[4]. For the first time, new common objects

[4] https://www.thoughtco.com/britains-great-exhibition-of-1851-1773797

from all over the world were exhibited, thus showing also the economic and social changes linked to the introduction of new technologies. These, indeed, led to a general improvement in social welfare conditions and to an increase in labour productivity. Despite the considerable influence of the Exhibition, these objects were defined as "depressing" and "tasteless", thus triggering a bitter criticism with regard to the industrialization. Furthermore, this led to a split of society between the two streams of the reformists and the progressives, respectively in favor of craftsmanship and industry (Wilhide, 2016).

It was in Great Britain that the Arts and Cratfs movement, founded by William Morris in the late 18th century, spread in all fields of applied arts, with the aim of promoting a return to artisanal production and facing the overall crisis of moral and aesthetic values caused by the industrialization process (De Fusco, 1985). As argued by Morris (De Carlo, 1947), indeed, mass production can warp the essence of an object, depriving its uniqueness, while craftsmanship can be considered the highest expression of a man's work and his needs. The philosophy of Arts and Crafts influenced the whole Europe between the end of the 19th century and the first half of the 20th century, while laying the foundations for some artistic movements that are strictly related to the design world - such as Art Nouveau, which spread from France to overseas countries (Wilhide, 2016).

Germany was among the main industrialized countries during this period (Wilhide, 2016). In 1907, an association including some of the greatest artists, architects, and industrialists of the time namely the Deutscher Werkbund, was founded by Hermann Muthesius. Inspired by the principles of the Arts and Crafts, it did not discourage the use of machines although it was aimed at improving the aesthetic quality of products. For this reason, it can be said that, even though recognizing the irreversibility of technological progress, the Deutscher Werkbund ennobled craftmanship while always trying to keep the relationship between art and industry. Hence, the industrial design grew up, based on the two pillars of modernity that are art and industry (De Fusco, 1985)[5].

The Deutscher Werkbund represented a crucial stage in the evolution of design, and its principles led to the foundation of the first school of applied arts, namely Bauhaus (1919-1933). This movement constituted a landmark for all the avant-garde design and architecture

[5] The first industrial designer of history realized the company's logo, graphics, advertisings as well as the design of production plants and some products, thus contributing to creating a well-defined image of the whole company (De Fusco, 1985). This concept has become today an essential point for companies that present themselves as a platform for experimentation of new trends in art, design and marketing.

movements strictly associated with rationalism and functionalism, while promoting an ethical function of designers in society (Wilhide, 2016).

Later, in 19th century, between the two Great Wars, design proved its considerable economic potential on a larger scale. The war industry was a test case for the research and development of new technologies and materials, which were further used in everyday objects (De Fusco, 1985). In Italy, among the most remarkable companies of that period, stood Olivetti & C. S.p.A., also considered by its competitors as the most productive company from the '40s to the '70s. Indeed, thanks to its ability in using design as a strategic resource for achieving high economic and financial performances, Olivetti promoted the foundation of other important companies, still operating within the furniture sector, such as Artemide, Cassina, Flos, and Kartell (Cherubini and Eminente, 2015).

Meanwhile, other Italian companies, such as La Rinascente, Pirelli, Mondadori, Feltrinelli, became increasingly attractive to young designers, photographers and illustrators who saw in those firms a fertile ground for the development of original ideas and experiments, thus contributing to making Italy a great creative laboratory for worldwide recognition (Laghezza and Lucchese, 2016).

In the 1960s, designers inspired the development of new movements, namely the Pop Art of Andy Warhol and the New Dada, whose purposes were to give new life to everyday objects, different from the ones they were usually associated with. Later, in 1972, an exhibition titled "Italy: the new domestic landscape", which took place at the Moma of New York, helped to further affirm the importance of Italian style and design worldwide.

As the 20th century progressed, design continued to permeate consumers' lifestyle, thus becoming both a driving force and a reflection of the changes in popular culture, right up to postmodernism (Wilhide, 2016). The 1980s and 1990s saw a remarkable evolution of individual lifestyles, a growing degree of market competitiveness, a development of the digital era with several related innovations. All this contributed to the emergence of new concepts of design, including experience design (Waterworth and Hoshi, 2016) and brand design (Atrees, 2015) which made the concept even more complex to define. For example, in the field of experience, design products and services are offered in order to be used by consumers in a personal and memorable way, through the creation and management of moments of engagements (Tu and Yang, 2019). On the other hand, brand design focuses on technical elements of the brand

management, such names, signs, and symbols that identify and differentiate a specific brand, including logo shapes, colours, and type fonts (Lieven et al., 2015).

Additionally, emerging topics such as innovation, sustainability, and circular economy are further broadening the connotation of the concept of design, since companies and designers are called to create products with aesthetic and functional values, without neglecting the social emerging values on which consumers increasingly base their choices.

Thus, the concept of design has been enriched with new connotations and broader meanings, justifying the current existence of several definitions, which are different according to the specific context of analysis and the research purposes. The next sub-section will attempt to retrace the main definitions provided over the last decades, by highlighting the different meanings of the concept underlying them.

1.1.3 Towards a current definition of design

In 1969, Simon defined design as the process by which we plan actions aimed at changing existing conditions into preferred ones, through the creation of artefacts that satisfy both human needs and desires. This definition clearly emphasized a specific dimension of design, that is the functional one, thus anticipating more recent conceptualisations in which it is explicitly intended as a means to satisfy consumers' needs (Jindal et al., 2016). Similarly, but in a broader perspective, Kotler and Rath (1984) highlighted both the functional and the creative dimensions of design, by defining it as a tool which can be used by companies for consumers' satisfaction and company profitability through the creation of forms and values, as well as products' information and identities. Here, the fundamental role of design for companies' competitiveness is explicitly pointed out, as widely acknowledged by a consistent stream of research since the early '80s (Walsh et al., 1988; Roy and Potter, 1993; d'Ippolito, 2014; Press and Cooper, 2017).

The common trait that links the above definitions is the idea that design activities are strictly concerned with creative reasoning, as well as with human perceptions and skills. Thus, they are in line with the aforementioned Krippendorff's definition (1989), which acknowledged, at the same time, the relevance of functionality, creativity and aesthetic (Han et al., 2019).

More specifically, Krippendorff (1989, p. 14) argued that design also concerns sense-making: "Something must have form to be seen but must make sense to be understood and used". In this regard, creativity has been universally acknowledged as a fundamental skill for

a successful design as it has been strictly related to the aesthetic features of a product and to the creation of something that is new and valuable from consumers' perspective (Toh and Miller, 2019).

Later, in 1995, March and Smith defined design as a problem-solving activity, thus focusing the elaboration of the concept on the identification, generation, evaluation, and selection of alternative solutions. More specifically, they focused their attention on the functional dimension of design, as the fulfilment of specific needs is strictly linked to the solution of the problem, while the creative dimension refers only to the generation of different solutions. In a similar vein, d'Ippolito (2014) defined it as a part of a problem-solving activity which begins with the perception of a gap in a consumers' experience and pass through the realisation of physical and non-physical attributes of an artefact.

Both these last two definitions emphasize the relationship of design with functionality and creativity, even if d'Ippolito (2014) introduced another important dimension by considering the immaterial value of design, which is related to some individuals' values, expectations, and social standards underlying their choices and consumption processes. Therefore, as pointed out by Eisenman (2017), the concept of design takes on a wider meaning, as it can be expression of both functional and aesthetic dimensions as well as of immaterial values, such as, for example, environmental sustainability (Rocha et al., 2019).

Despite the different perspectives, which all of these definitions are mainly related to, it can be said that from the companies' standpoint design can improve their competitive performance regardless of those definitions. In fact, design can be used for satisfying the consumers' needs, for improving extant products, as well as for the realisation of something new. Overall, companies have become increasingly aware that design can affect consumers' behaviours and choices while triggering new needs and desires (Toufani et al., 2017; Gilal et al., 2018), for instance by creating new symbolic values to which consumers are increasingly paying their attention (Fabris, 2008).

1.2 THE STRATEGIC RELEVANCE OF DESIGN

In the current changing scenario, characterised by increasing competition and liberalisation of the world trade, the ways through which companies differentiate themselves are becoming even more critical for their survival (Ferreira et al., 2017; Ortiz-Villajos and Sotoca, 2018). Given that companies are now competing on different immaterial factors, such as innovation and

quality (Dereli, 2015), they need to be innovative in launching new products, while paying attention to meeting consumers' needs and expectations (Rubera and Kirca, 2017; Michna, 2018).

Within this context, the connotation and the role of design have deeply changed over the time. While in the past design was mainly associated with aesthetic and stylistic dimensions, as it allows modifications of forms and functions of the products (Tonkinwise, 2011; Holt, 2015), nowadays its relevance is considered from a more strategic standpoint, as it contributes in fostering both companies' innovation (Cooper et al., 2016; Pinto et al., 2017) and competitiveness (Dell'Era et al., 2017; Ughanwa and Baker, 2018). By incorporating the design activities into their strategies, companies are indeed more likely to achieve higher profits over competitors (Liu et al., 2015; Kramoliš and Staňková, 2017). According to the Design Economy Report (Fondazione Symbola, 2019)[6], in 2017, the percentage of Italian companies that have experienced an increase in their profits by investing in design activities is almost ten percentage points higher than other companies (35% vs. 27,2%). Similarly, the evolution of the export level reflected the same trend, with a percentage of design-oriented companies that gained an increase in their export of almost six percentage points higher than other companies (35.9% vs. 30%). Notably, the effects of design also result in other dimensions within the companies, thus transcending the merely economic advantage. For instance, design can affect productive processes that should be adapted in relation to the use of new materials and technologies, as well as to their business models, given its pervasiveness with other functions.

Given the multidimensionality of the concept of design and the related effects, the identification of a methodology which allows to exactly recognise (and quantify) the benefits resulting from investments in design by companies is a complex matter. Certainly, some explicit benefits linked to such investments can be identified, such as increased profits, sales, and market shares (Liu et al., 2015; Na et al., 2017), lower manufacturing costs (Ponche et al., 2012; Khateeb et al., 2019), and an enrichment of companies' offers (Haber and Fargnoli, 2017). Furthermore, as noted by several scholars (Bloch, 2011; d'Ippolito, 2014; Conti et al., 2019), companies which produce "beautiful and well made" products show higher success in attracting consumers. In fact, given the same prices and functions, consumers will choose the

[6] Survey conducted in 2018 on a sample of 3,000 manufacturing companies from 5 to 499 employees, statistically representative of the universe of 54,000 units.
Available at: https://www.symbola.net/ricerca/design-economy-2019/

most beautiful and attractive ones. Other indirect benefits related to design investments concern the knowledge in design capabilities that enable companies to innovate the functional, social, and emotional utilities of their products (Landoni et al., 2016), as well as to create an overall increasingly positive image in the long-term companies' reputation (Abecassis-Moedas and Rodrigues Pereira, 2016).

Table 1.1 summarizes the main benefits associated to design investments based on Liu and colleagues' (2015) research findings.

Table 1.1 – Benefits of design

Direct benefits of design investments	*Indirect benefits of design investments*
Higher product selling prices	Improved knowledge of design capabilities
Increased profits, sales, and market shares	Increased network of collaborations with external subjects
Lower manufacturing costs	Improved companies' image
Design-driven innovations	New opportunities to be seized

Source: personal elaboration based on Liu et al. (2015).

1.2.1 Design-driven innovation

Innovation appears among the main benefits that can be directly associated to design (Liu et al., 2015).

Generally defined as a process or a physical outcome which results in new products' features, technologies, and emotions, the topic of innovation as a key driver of development and economic growth has been widely addressed in the managerial literature (Pece et al., 2015; Raghupathi and Raghupathi, 2017; Whicher, 2017). This concept revealed its importance in different fields and industries, from economics to technology, from science to engineering, thus becoming a critical factor for companies' success and survival.

The relationship between design and innovation is well established in prior research. Since the late 1990s, Roy and Riedel (1997) claimed that an immaterial resource which can lead to innovation can be identified in design, while later Mozota (2003) distinguished between the influence of design on companies' strategies and products' innovation. As pointed out by Veryzer et al. (1999, p. 29) design "is one of the primary means by which new technology is transferred out of the R&D lab and into the market in the form of new and usable products". In this regards, they considered Apple as a virtuous company, since it has been able to embed innovations in its products through the use of a "systems-inspired design approach" in the form of "intuitive operations, user-friendly graphical interfaces, and the ease with which

components can be put together" (Veryzer et al., 1999, p. 30). This is the case of the iPod, for example, which is primary meant for listening to music, meanwhile it offers the possibility to access and organise music through the Apple music software, namely iTunes.

Prior research (Moroni et al., 2015; Landoni et al., 2016; Na et al., 2017) found different ways through which design can be related to innovation. As pointed out by Hernández and colleagues (2018), the first way consisted in using design to differentiate. According to this theory, companies make greater investments in the early stage of product lifecycle to achieve incremental innovations. For instance, new visual and technical features can serve as a means through which they can consolidate their market shares by attracting new consumers. Furthermore, during the later stages they can also decide to provide consumers with targeted services, such as customization of their products and after-sales support activities. Therefore, design attributes of a product, both physical and functional ones, can influence the nature of innovation during its whole lifecycle. Secondly, design can be used to introduce and facilitate the adoption of innovations in the market. As pointed out by several scholars (Moroni et al., 2015; Ceschin and Gaziulusoy, 2016; Tabeau et al., 2017), companies can innovate by modifying both functions and forms of their products, respectively defined as technological and design innovations. In this latter case, the realisation of design attributes which are in line with consumers' tastes can allow companies to improve their brand awareness and, at the same, can increase their willingness to implement these innovations as a consequence of the consumers' acceptance of the novelties. Thirdly, design can be used to transform ideas into concepts: new engineering and visualisation software and techniques, as well as cooperation between companies and external subjects of design can enhance the realization of new emerging ideas and their transformation into innovative products. In this sense, design can be considered as a tool, or as a set of tools, that can be used to concretely translate ideas into innovative products. Fourthly, design can be intended as a research tool for new product development. Verganti (2006) pointed out that innovative design-products do not only come from market requirements or new technology opportunities, but they can also arise from the possibilities that new lifestyles bring. In this regard, design can be intended as a cultural process aimed at uncovering new societal and economic trends. Fifthly, design can be considered as a creative, generative thinking process. In the early 2000's, Moore (2004) stated that design can be identified as a problem-solving activity which enables companies to realize and to explore different alternatives. Hence, this process allows them to select the most suitable one in order

to accomplish several different goals, such as the introduction of a new product and/or the entrance into new markets. Finally, design can be intended as a set of tools and techniques aimed at integrating concepts, people, and functions. By involving different departments within the companies from the earliest stage of product development, design activities allow the integration of internal and external knowledge, thus enabling different type of product and process innovations to occur. Furthermore, collaborations with other companies operating within the same or different sectors can lead to the development of new interesting and profitable ideas for future projects, particularly in the case of those companies operating within the Italian industrial districts.

Therefore, the innovative value of design can be found in different stages of the value chain. The outputs of design activities represent the final stage of a creative process that involves different functions and people within companies, through a continuous exchange of ideas and skills. From the initial phase of product development, design can be intended as a set of activities aimed at the concrete realisation of innovative products to meet consumers' needs, particularly the unmet ones. Additionally, design can be used by companies as a research tool as it allows them to learn new ways of using existing products based on identified market's trends. At the same time, it facilitates the introduction and the subsequent acceptance of innovation from the consumers. In this regard, design can be used by companies also as a communication tool for values and goals. For instance, some companies can use particular labels for their products with the aim of providing information about the raw material used.

The way design is actually embedded into innovative products by companies depends on different internal and external factors (Whicher et al., 2011; Hernández et al., 2018). Among the internal mediating factors, there are the companies' culture and system of values, in addition to the top management's goals and attitudes. In this regard, Deserti and Rizzo (2014) claimed that companies should incorporate design in their culture, by integrating it through bottom-up processes, in order to exploit the design's potential for innovation. Here the top management plays a critical role, since it can facilitate the spread of a design-based culture among the various activities of the company, by simply recognizing its potentials. This theory proves to be particularly true in small and medium companies, where there is a low degree of delegation (Graham et al., 2015; Martin et al., 2016). Concerning the external mediating factors, political and socioeconomic factors can further affect the role of design in innovation processes. For instance, during the last decades, the increasing concerns for sustainability and

environmental issues faced by Governments and companies is forcing the realisation of products that meet environmental requirements (Katsikeas et al., 2016; Petersen and Brockhaus, 2017). In this respect, the implementation of more efficient processes and the use of more sustainable raw materials can be used as tools to design innovative products which are compliant with new environmental updated regulations. Notably, several attempts (Rubera, 2015; Na et al., 2017; Hernández et al., 2018) tried to categorize the way through which the relationship between design and companies' innovative performances comes out, and how this can be moderated by different variables, such as branding strategy (Rubera and Droge, 2013), the national tradition of design in a specific country (Micheli and Gemser, 2016), and the consumers' exposure to innovations (Landwehr et al., 2013).

The conclusions derived from these studies provided theoretical and empirical evidence of the existence of a bi-univocal relationship between design and innovation. However, despite the increasing interest towards the strategic role of design-driven innovation in business literature, only a limited number of companies is actively and systematically embedding design in their strategies; hence the need to further investigate this current and complex topic with the aim to provide useful additional empirical evidence for managerial purposes. Economic incentives and support programmes provided by Governments can be particularly helpful for the companies that decide to update and train their equipment and personnel to this goal.

1.2.2 Design and competitive advantage

Strictly related to the innovative value of design is its great potential as a factor of competitiveness. According to Porter (1985), in order to gain and sustain their long-term competitiveness, companies can adopt different strategies, including cost leadership and differentiation. While the formers are aimed at reducing companies' production costs - thus allowing them to charge competitive prices - the latter are used to distinguish a product (or service) from other similar products (Porter, 1985).

Differentiation strategies are usually aimed at developing unique products (or services) for the consumers, in terms of features, technology, aesthetics, and quality. In this regard, it is important to note that, given that the competitive advantage is mainly based on the concept of resource inimitability, intangible resources constitute a valid tool to be used in pursuing and maintaining competitiveness in the long-term. Falling under the definition of intangible resource (Rusten and Bryson, 2010), design can be used in several ways for gaining successful

results in terms of competitiveness. For instance, it can be used to widen the companies' offerings in terms of visual characteristics and functionalities, as previously discussed (Haber and Fargnoli, 2017). Moreover, the legal protection of design can also be considered as a powerful source for providing long-term competitiveness (Liu et al., 2015), particularly in those industries characterised by a high degree of product imitation, for which the rarity value of production must be guaranteed (Filippetti and D'Ippolito, 2017).

Despite the broad recognition of the design value for competitiveness, companies still tend to consider it as a cost, rather than an activity that can generate, among other benefits, increased profits (Na et al., 2017). More specifically, design is often considered as a tool, a function or a process only aimed at shaping the style of their products (Liu and de Bont, 2017). Additionally, due to the economic downturn related to the Great Crisis of 2008, consumers are now more aware about the prices they are willing to pay for their purchases (except for luxury goods where the price is not considered as a decisive factor in their choices). Consequently, by recognising the increasing awareness of consumers concerning product prices, companies tend to consider design as a risky activity, as their offering may not find a completely positive response in this uncertain economic environment.

This limited understanding of the benefits linked to design can prevent companies from grasping and taking advantage of the added value given by design. The above controversial considerations provide suggestions for future research aimed at investigating the strategic relevance of design for the companies. Notably, given the importance accorded to the design concept both from the academic and the managerial perspectives, the overall aim of the present study is to understand whether and how design can be still considered as a source of competitive advantage during the current and in the future economic scenario.

1.2.3 Design-based policies: a common perspective

As a consequence of the increasing awareness of the importance of design for companies' innovation and competitiveness, the European Commission (EU) has been increasingly encouraging EU member States to develop and implement design-related policies with several initiatives (European Commission, 2013[7]; Design Council, 2015[8]; European Commission,

[7] Available at: https://ec.europa.eu/growth/industry/innovation/policy/design_en

[8] Available at: https://www.designcouncil.org.uk/resources/report/innovation-design

2015a[9]). Defined as "design support programmes", these initiatives concern the implementation of policies by Governments aimed at increasing the investments in design activities within companies by enhancing the comprehension of their overall benefits (SEE, 2013b).

For instance, the establishment of the SEE Platform (Sharing European Experience on Design Innovation Policy)[10], founded by the European Commission and led by PDR at Cardiff Metropolitan University from 2012 to 2015, has allowed to successfully integrate design into 18 (national and regional) policies by engaging over 1,000 European policy-makers. Some examples include: Design Innovation Alliance (Denmark), Design Bulldozer (Estonia), Design for Dementia (Ireland), Design Thinking in Public Services (UK) and Design for Independent Living (Wales).

In 2013, the EU launched its Action Plan for Design-driven Innovation[11]. While consolidating the already existing tools for design, it pursued additional goals, among which promoting understanding of design's impact on innovation and enhancing new collaborative innovation strategies and practices for implementing new business models (European Commission, 2013). In this regard, the Commission also called for the provision of specialised design-based training and mentoring initiatives for SMEs, in addition to design-led innovation incubators to support companies in using design as a factor for innovation (European Commission, 2013). "A more systematic use of design as a tool for user-centred and market-driven innovation in all sectors of the economy, complementary to R&D, would improve European competitiveness" (European Commission, 2013, p. 4).

In 2015, 15 of the 28 EU member States could benefit from several programmes offering support for design (Whicher, 2017), including France, Ireland, Italy, and Spain. Some countries implemented these initiatives only at a regional level, particularly where the legislative power is devolved to regional governments rather than national ones, among which Germany, Belgium, and UK. However, only four programmes were focused on the supply side, among which Design Terminal in Hungary, Design, Business, Profit in Poland, and Design Management Competence Centre in Slovenia. Exhibitions and trade fairs, web platforms and workshops on

[9] Available at: https://www.eea.europa.eu/policy-documents/com-2015-0614-final
[10] Available at: https://ec.europa.eu/easme/sites/easme-site/files/759629_design_options_paper.pdf
[11] Available at: http://www.designforeurope.eu/

new trends in design have been used to facilitate the communication between companies, consumers, and design actors.

All these initiatives are based on a common view: a more strategic use of design can provide several benefits, both at societal and economic levels. While from the consumers' perspective, advanced technologies along with beautiful appearance of the products can improve the quality of their experiences, on the other side, companies can achieve better results in terms of innovative and competitive performances within the current economic scenario. Hence, these main reasons could motivate Governments and companies to put their efforts in fostering the diffusion of the design culture.

CHAPTER 2

THE EVOLUTION OF DESIGN: CHALLENGES AND PROSPECTS IN THE CURRENT SCENARIO

2.1 NEW CONSUMPTION'S TRENDS AND COMPETITIVE CHALLENGES: WHERE ARE WE GOING?

Several effects of the global economic crisis which occurred in 2008, such as the increasing unemployment, financial market volatility and public spending cuts, are still affecting companies' and consumers' everyday lives (Neri and Ropele, 2015; Abiad et al., 2016). Some indicators of economic development, like Gross Domestic Product (GDP) and poverty level, as well as other measures of consumption trends in different areas (e.g., food, housing, and transportation) are showing a considerable impact of the above consequences. According to Eurostat (2019), 21.7% of the European population – around 109 million people – was at risk of poverty or social exclusion in 2018[12], while consumption per capita increased by 0.84%[13] compared to the previous year. These indicators clearly show that consumers reacted to the economic crisis with several changes in their lifestyles and consumption behaviours (Katz-Gerro et al., 2017; Koos et al., 2017).

From a sociological standpoint, Lekakis (2017) identified different types of consumers' reaction to crisis, namely *reinforcement*, *resilience,* and *resistance*. *Reinforcement* refers to consumers' orientation to purchase national products in order to support the growth of national economy. *Resilience* refers to new ways of reorganizing the consumption process, for instance through different ways of purchasing, such as social cooperatives and online platforms. Finally, the concept of *resistance* is related to consumption practices used as a means to support ethical questionable market practices, for instance through fair trade.

On a more individual level, examples of changes in consumption patterns can be identified in the rearrangement of consumers' behaviours. While some individuals are facing a drop in their

[12] Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Living_conditions_in_Europe_-_poverty_and_social_exclusion

[13] Source: personal elaboration based on data available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=GDP_per_capita,_consumption_per_capita_and_price_level_indices#Relative_volumes_of_consumption_per_capita

available income due to job losses, others are experiencing uncertainty about their salary level (Calvo-Porral et al., 2016). These concerns affect the market demand in a negative way, particularly when referring to precarious workers. Consumers, indeed, often reduce or stop to purchase some products, by preferring their substitutes and using products for longer (Koos et al., 2017; Dalmoro et al., 2020). Others change their purchasing decisions by preferring lower-quality products at a cheaper price. Overall, recent studies (Ion, 2014; Katz-Gerro et al., 2017) demonstrated that the goal of improving one's standard of living in order to deal with the increasing uncertainty has been often replaced by the one of simply satisfying basic needs. In the specific context of Italy, Gosetti (2012) pointed out that one out of three consumers' families cut their spending on food, while one out of four reduced their purchases on toiletries and medicines. Similarly, Alonso et al. (2015) claimed that Spanish consumers prefer to buy second-hand products, thus showing their desire for a return to frugality in their purchasing choices.

These changes, while revealing the emergence of new consumption values and objectives, are forcing companies to adopt new strategies aimed at sustaining their competitiveness and ability to address the evolving consumers' expectations (Grappi and Romani, 2015).

The rest of this Chapter will provide an in-depth analysis of such changes, in order to understand whether and how the design strategies should be implemented to support companies' innovativeness and success.

2.1.1 The effects of the economic crisis on consumers' behaviours

Over the last decade, several effects of the economic crisis - from increasing unemployment to massive cuts in public spending – have influenced consumers' needs and perceptions, thus affecting their lifestyles, consumption patterns and the overall societal well-being (Alonso et al., 2015; Koos, 2017). Notwithstanding these negative effects, which are particularly evident among young and precariously employed workers, consumers are actively adopting different strategies and means of social resilience to cope with the crisis, thus triggering unprecedent consumption behaviours based on more frugal values and goals.

The way through which people react to a crisis can vary according to different socioeconomic groups and, more generally, to national contexts. For this reason, several attempts have been carried out by scholars to understand and categorise such reactions over the last decades (Vihalemm et al., 2016; Koos, 2017; Lekakis, 2017).

Different authors (Neri and Ropele, 2015; Crescenzi et al., 2016; Morlino and Quaranta, 2016) focused their attention on both the antecedents and consequences of the crisis at a macro-level, by emphasizing changes in both market demand and production structures on different industries, and in the declining growth rate related to increased inflation. Within this context, the institutional scenario of a country has been often considered as a possible influential factor on the consumers' response to crisis (Koos, 2017). Changes in the aggregate demand, indeed, can result in a worsening of the economic situation of a country, thus giving rise to an endless vicious circle. In this context, Governments can play a crucial role in supporting both companies and consumers with fiscal and economic incentives. In this way, through economic measures such as unemployment benefits and social assistance, countries with a stable Welfare system would be able to sustain the consumers struggling with serious financial issues.

Another stream of literature analysed the changes in consumers' attitudes and perceptions amid different countries by assuming a micro-level perspective (Priporas et al., 2015; Boutsouki, 2019). In this regard, several models aimed at assessing these changes have been proposed. For instance, some studies, despite neglecting the disposal and usage dimensions, focused on purchasing intentions and behaviours (Alonso et al., 2015; Katz-Gerro et al., 2017), thus revealing that consumers might decide to buy smaller quantity of products with the same prices or decide to buy at discount stores to benefit from price cut. Other studies pointed out the negative effects of the economic crisis on a psychological level, as they produce a sense of uncertainty and confusion among individuals about their future (Van Hal, 2015; Koos, 2017). Indeed, people are not so keen on buying a house, as they are more afraid of job losses. Moreover, consumers have shown the tendency to become increasingly reluctant to buy high-quality products and tend to turn to cheaper brands as a consequence of their reduced available income, thus proving to be more rational in their choices.

Further studies have investigated the role that some consumers' characteristics such as age-group and socio-economic class play in the way people address the crisis' consequences. Urbonavičius and Pikturnienė's study (2010) provided a framework of different consumers' emotional responses to the economic crisis by distinguishing six behavioural patterns. Firstly, consumers might not change their consumption behaviours. Secondly, some consumers are forced to decrease their consumption in order to be able to survive, while others might decide to reallocate their spending to make savings, as a means of protection against future losses. Some groups might decide to concentrate their spending on a short-term basis with the aim to

increase life quality. Finally, some consumers might decide to buy more products or higher quality ones. Different results were achieved by other scholars. For instance, Alonso and colleagues (2015), in a qualitative study focused on Spanish consumers, found out that middle and upper classes' cultural habits are mainly based on expensive consumption practices, thus forcing consumers to face more difficulties compared to people in lower classes, whose behaviours have not radically changed due to the economic crisis as they are the "least influenced by the pressure of excessive consumption and imitation" (p.72). Similarly, Katz-Gerro and colleagues (2017) highlighted that consumers of lower socio-economic classes are not really experiencing serious difficulties, since the limitations imposed on spending and consuming given by the crisis are in fact their existential economic condition[14].

Despite some confusion and contradictions linked to the results (Koos, 2017), there is a general consensus on the fact that the consequences of the economic crisis have strongly influenced consumption patterns, thus reshaping the consumers' perceptions about what is necessary and what is not. As pointed out by Katz-Gerro and colleagues (2017), the changes induced by the crisis have pushed people to reshape their consumption habits and, more generally, have strongly influenced the relationship between the growth and the development of economy and society.

Undoubtedly, these changes in the social scenario occurred after both the limitation in daily consumption and the growing common sense of uncertainty have resulted in economic and psychological effects (Koos, 2017). Such mechanisms are tightly related to each other, since by limiting the amount of available resources, consumers will directly feel psychologically more vulnerable as well, as they might not be able to afford some spending.

Besides these effects, which can be considered as directly related to the economic crisis, the changes in consumption patterns imply the emergence of new values and new consumers' expectations, which have been only partially strengthened by the occurrence of the economic crisis.

[14] In addition, they explicitly condemned middle and upper classes' consumption habits for not having considered the possibility of developing alternative sustainable forms of consumption. Surprisingly, those in upper classes relieved themselves of any responsibility, by blaming irrational spending at a more general level as the cause of the crisis itself.

2.1.2 The changes in consumers' values and consumption patterns

Starting from 2015, a slight economic recovery with several consequences on consumers' habits and behaviours has been recorded. In 2018, Italian household consumption slightly increased compared to that of 2017 (+0.3%), when an increase of 1.6% over 2016 was verified (Istat, 2019)[15]. While food consumption spending had increased by 1,3% over the previous year, almost half of Italian households (48,9%) declared that their spending on clothing and footwear dropped, thus revealing differences among sectors[16]. These changes occurred within an evolving context, involving economy, society, and culture, characterized by different megatrends (North, 2017), as shown in Table 2.1:

Table 2.1 - Megatrends

Smart Cities and Smart Homes	Premiumisation	Circular Economy	Reinvented shopping	Customization
Healthy living	Changes in gender roles	Ethical living	Changes in family dynamics	Connected Consumers
Sharing Economy	Experience economy	Authenticity	Middle class retreat	Multiculturalism
Generation Gaps	Fast purchasing	Shifting market frontiers	New working conditions	Search for simplicity

Source: North (2017).

Economic growth of emerging and developing countries, population growth, new technologies, environmental pressures, and changes in consumers' values have been recognised as the underlying causes of such megatrends, which are expected to have global consequences on both consumers' and companies' behaviours even in years to come.

As for food consumption, for instance, consumers have been showing increasing awareness in terms of product quality and ingredients by turning towards organic food (Basha et al., 2015; Hashem et al., 2018). Italian consumption of organic products reached 3.6 billion in 2018, an increase of 178% over the previous year.[17] Consumers are now spending more on goods and services that allow them to live positive emotions and experiences, such as happiness and entertainment (Cachero-Martínez and Vázquez-Casielles, 2017). This is in line with other studies (Foroudi et al. 2016; Ladhari et al., 2017) which demonstrate that emotions arising from

[15] Available at: https://www.istat.it/it/files/2019/06/Spese-delle-famiglie-Anno-2018_rev.pdf
[16] Available at: http://www.today.it/economia/spesa-famiglie-2018.html
[17] Available at: https://quifinanza.it/green/consumi-boom-biologico-nel-carrello-per-2-italiani-su-3/306489/

shopping experiences directly influence consumers' satisfaction, more than the effectiveness of goods or services in meeting consumers' needs.

Furthermore, thanks to the growth of web 2.0 and the development of ICTs, different ways of consumption based on the integration of ownership, production, and consumption are encouraging the development of new consumption patterns based on the sharing economy principles (Hamari et al., 2016; Böcker and Meelen, 2017). According to the Second National Report on Sharing Mobility (Gruppo Unipol, 2018), sharing mobility services experienced an increase between 2015 and 2017, with more than one million consumers using car sharing services offered by dedicated online platforms[18]. Recent studies (Lamberton and Rose, 2012; Tussyadiah, 2015; Lawson et al., 2016) demonstrated that consumers' motivations to adopt such practices, which give the opportunity to enjoy the availability of a good or service without necessarily having to buy it, are influenced by both economic and social benefits.

Generally speaking, it can be said that changes in consumers' behaviours are triggered by different technological, economic and social trends (Ferrero, 2018), which lead to a new consumer profile characterized by increasing autonomy and consciousness, high selectivity, search for authenticity, and a great request for experiences, which help them to escape from the constraints and boredom of everyday life (Ricci et al., 2016; Cachero-Martínez and Vázquez-Casielles, 2017).

According to Ferrero (2018), three keywords can be used to describe the emerging consumers' values underlying their consumption patterns and behaviours: symbol, identity, and experience. As for the symbolic value, consumption practices can be used by consumers as a tool to communicate their values and to express their social identity and sense of belonging to a specific group. In this regard, for instance, the consumption of luxury goods could be relevant for consumers in search of social approval. Identity, on the other hand, refers to consumption purposes. Goods are no longer seen as means for meeting consumers' needs, but rather as a way for satisfying personal desires and for building their self-identity. This consideration is particularly relevant when referring to postmodern consumers, as they often show several lifestyles associated with different value systems, mainly due to a high sense of discouragement towards the institutions (Ferrero, 2018). Finally, experience is strictly linked to consumers' purchasing intention. Individuals are paying greater attention to the emotions and feelings they are experiencing while buying goods and services. More specifically, they are looking for brands

[18] Available at: http://www.unipol.it/sites/corporate/files/sharingeconomyquaderno.pdf

that allow them to live interactive experiences, and to intrigue them in sensorial, customized, emotional, and creative ways (Barkworth, 2014[19]; Ebrahim et al., 2016). Furthermore, consumers are seeking for experiences and opportunities that allow them to collaborate with brands[20]. Hence, they tend to differentiate brands based on several immaterial aspects rather than products attributes.

Other emerging values affecting consumers' habits and behaviours can be identified in the increasing empowerment and the greater attention towards environmental issues and sustainability (Boccia Artieri, 2012; Fortezza, 2014; Ferrero, 2018). Consumers are experiencing increasing control over their purchasing choices. In this regards, empowered consumers are more aware of the wide range of existing products and they are better prepared to choose the products that best meet their needs, thus reaching higher level of satisfaction (Castillo, 2017). Furthermore, thanks to the possibility of sharing their opinions through the web, consumers can also affect brands' reputation and provide suggestions for further innovative processes. This is confirmed by Fabris (2008), who anticipated that consumers can claim the right to the fulfilment of their needs, by deciding to repurchase or not a product. Overall, consumers can be considered as the real decision-makers, now that they are able to take more informed and aware choices.

Besides consumers' empowerment, increasing concerns about environmental issues and uncertain economic development are enhancing the adoption of more sustainable behaviours. The great extent of these consequences can also be seen on Governments' political agendas, as demonstrated by several public debates, such as UN and Greta Thunberg's discourses during the last years, which are highlighting the growing public interest in environmental issues (Moravcikova et al., 2017; Holmberg and Alvinius, 2019). Examples of the newly found attention towards the concept of sustainability in consumers can be traced down to activities such as the purchase of organic products or energy-saving appliances, the tendency to use durable goods for a longer period, as well as the actions of recycling and reusing (Watkins et al., 2016; Hüttel et al., 2018). Guckian and colleagues (2017) stated that this phenomenon, namely *Green Consumerism*, can be defined as a movement that enables consumers to engage in pro-environmental behaviours. Moreover, the main psychological variables working behind this

[19] Available at: https://www.forbes.com/sites/onmarketing/2014/02/04/six-trends-that-will-shape-consumer-behavior-this-year/

[20] Thanks to the web, consumers can now actively claim for the relaunching of specific products, as in the case of McDonalds and other brands, for which their online petitions have been successful.

newly found consumers motivation can be identified in their hopes and beliefs (Sachdeva and Goel, 2015). More specifically, the consumers who are more likely to believe in the effectiveness of their behaviours are more likely to buy environmentally friendly products. On the contrary, negative predictions concerning the environmental consequences of climate change can lead to a sense of helplessness and resignation among individuals.

2.1.3 Hyper-competition and new competitive strategies

Considering the companies' perspective, the consequences of the economic crisis, as well as of some of the above consumers' trends often resulted in a decline of their profits, thus making their growth and survival more difficult and challenging (Naidoo, 2010; Domi and Krasniqi, 2019).

According to recent studies (Skidelsky and Fraccaroli, 2017; Hampson et al., 2018; Demyanyk et al., 2019), the economic recession should be considered as a stimulus for adopting different strategies, which can be divided into two different types: offensive and defensive strategies (Cesaroni et al., 2015; Bayraktar et al., 2017). While the former are aimed at creating new opportunities for value creation in the medium-long term, mainly through investments in R&D activities, the latter are aimed at guaranteeing the company's survival in the short-term through cost-cutting activities. Other than these two possibilities, companies can also decide to implement other strategies, such as new markets entry, prices and products portfolio diversification and continuous innovation (Hoffmann et al., 2017; Lianto et al., 2018; Garrido-Prada et al., 2019).

Based on the increasing consumer's empowerment, practices such as co-creation, crowdsourcing, mass-customization, and the founding of brand communities are further emerging as powerful means that can be used by companies to strengthen the relationship with their consumers, as they can be used to directly interact with them for different marketing purposes (Acar and Puntoni, 2016). In this regard, several initiatives can be implemented (Fuchs and Schreier, 2011; Acar and Puntoni, 2016). For instance, companies can use their social media channels to involve customers in creating something for the brand or in selecting an option, e.g., a new product to be developed or a slogan, as well as in answering consumers' comments or complaints. Additionally, companies can provide consumers with environmental information

through products' labels, and through the use of distribution strategies that can improve the accessibility of green products and services[21].

Given that consumers-generated advertisements and, more generally word of mouth (WOM), are perceived as more credible and persuasive messages, consumers' empowerment can contribute to enhance the effectiveness of companies' claims. However, this requires a continuous monitoring of the information on the web, particularly when referring to negative messages. In addition, these initiatives can help companies to deal with increasing advertising expenditures, by allowing them to choose among different alternatives at lower costs.

The increasing attention towards experiences and related emotions requires further efforts by companies to adapt to consumers' expectations, in order to provide emotionally engaging experiences. By doing so, companies can strengthen their relationships with consumers. For example, the cosmetic brand Lash provides its customers with engaging experiences in their shops, by showing and explaining for free how to use their products. Furthermore, every year the company organises the event, namely *Creative Showcase*, with the aim of promoting the launch of new products and to talk about new ethical and digital initiatives, thus giving the participants the possibility to assist to the practical realisation of the products and to talk with their inventors.

Overall, within this challenging scenario, companies should enhance the adoption of new values creation models. It would not be an overstatement, in fact, to say that their concept of value needs to be reshaped, in order to be in line with the needs and expectations of the new generations. Consumers, indeed, prefer accessing rather than purchasing a good and consider consumption practices as an expression of their identity and a matter of ethical concern. The development of new distribution channels, along with the enhancement of more direct relationships with consumers through social media channels, represent powerful tools that can be adopted by companies in the digital era. In this regard, companies should put more efforts

[21]For instance, IKEA is following a specific strategy focused on different areas: products and services, buildings and transport and customer service. More specifically, products and services must be realised with recycled, renewable, or sustainable materials in order to long last and, moreover, they must be designed in such a way that allows assembly, adaptation and repair. As for buildings and transport, IKEA is planning to work with its suppliers by using renewable energies with the aim to realise and distribute products worldwide in the most efficient way. Additionally, IKEA is planning to increase consumers support by providing services aimed at prolonging products' lifecycles through repair programmes. Lastly, there is also the possibility to rent and share products, as well as the possibility to give them back, with the aim to give them a second home or to be recycled for the realisation of new ones.
Available at: https://www.ikea.com/it/it/customer-service/regolamento-dai-una-seconda-vita-ai-tuoi-mobili-usati-ikea-pubfdc877db

in developing digital strategies, which could be particularly helpful in collecting and interpreting information about consumers' preferences. However, it may not be easy for companies (particularly SMEs) to implement all the above discussed strategies, not only because they often require a large amount of economic, managerial, and technical resources to be invested, but also because in order to be adopted they need a forward-looking attitude able to look beyond short-term difficulties. Moreover, the above strategies should not replace the attention of companies towards innovation, as this is widely recognized as a key driver for companies' economic success and long-term competitiveness, especially within uncertain and changing conditions (Dereli, 2015; Lee and Trimi, 2018; Coad et al., 2019).

2.1.4 The critical role of innovation for companies

Innovation has been widely recognized by previous research (Ciocanel and Pavelescu, 2015; Brem et al., 2016; Ferreira et al., 2017) to have a strategic relevance in companies' ability to sustain competitiveness, thanks to the drive it gives companies in their needs to continuously realise new products. In line with this stream of literature, Dereli (2015) pointed out that technology plays a fundamental role in innovation and contributes to redefine the rules of competition by changing foundations of industrial structure. Some scholars (Talay and Townsend, 2015; Qian and Wang, 2017) also argued that an increasing competitive pressure can lead to a technology race among companies operating within the same industry.

Despite innovation requiring high amounts of resources and flexibility by companies, what clearly has emerged in recent literature is that only the companies that continuously develop and offer innovative products seem to be able to overcome the competition (Dereli, 2015; Qian and Wang, 2017). In fact, in order to overcome market changes, and given the continuous shortening of products' life cycle, more frequent actions of innovation rather than periodic ones are made necessary (Plewa, 2017). The management of creativity improves the possibility to enter new markets (Sok and O'Cass, 2015; Sutapa et al., 2017; Cropley and Oppert, 2018). In addition, innovation can be used as a tool to influence consumers' preferences within their reference markets. For instance, by introducing products never seen before, companies can trigger the advent of new needs and desires.

Generally speaking, an effective implementation and management of innovation can lead to an improvement of the social well-being and of the national economic development (Dereli, 2015; Coad et al., 2019). The ability of companies to meet consumers' expectations, indeed, can

increase the market demand, which, in turn, may improve the employment rate, as companies need more work-force to satisfy their production goals.

The overall relationship between competition and innovation has been widely investigated by the economic literature from the beginning of the 20th century, although results are still contradictory (Aghion, 2018). The debate dates back to the mid 30's, when Schumpeter highlighted the existence of a negative relationship between competition and innovation, referred to as the *Schumpeterian effect*. He stated that an increase in competition acts as a deterrent to innovation, as incentives in innovation investments are strictly related to the amount of profit that companies are able to gain (Schumpeter, 1943). In other words, competition and uncertainty can reduce the profit expected to gain from investments made in R&D activities, thus discouraging companies to invest in innovation (Negassi et al., 2019). However, this consideration could not be valid for large companies, as these are more endowed with financial resources to be invested in R&D activities, and this can protect their innovations, thanks to registered patents (Mulkay, 2019).

Conversely, Arrow (1962) pointed out the existence of a positive relationship between competition and innovation, defined as the *Arrow's escape competition effect*. He posited that companies can gain more benefits from innovation when there is a strong degree of competition within the market, thus highlighting the role of competition as a key-driver for innovation activities. More specifically, as the competition increases, companies will increase their investments in R&D activities to overtake their competitors.

In more recent years, Aghion and colleagues (2005) developed a model which predicts the existence of an inverse-U relationship between competition and innovation, based on a previous work published in 1997. They argued that a perfect competition market decreases the need to invest in innovation and *vice versa*. By looking at the UK industry level data of the years registered between 1973-1994, they demonstrated that competition has a positive effect on innovation up to a certain level and after this one, increasing competition becomes harmful for innovation. In this regard, they detected two emerging effects (pp. 720-721): "In this model competition may increase the incremental profit from innovating, labelled the "escape-competition effect", but competition may also reduce innovation incentives for laggards, labelled the "Schumpeterian effect". The balance between these two effects changes between low and high levels of competition, generating an inverted-U relationship."

Over the last decades, these contrasting results has led to several theoretical and empirical efforts to shed light on this phenomenon. These efforts are based on a replication or extension of the above-mentioned model (Hashmi and Van Biesebroeck, 2016; Beneito et al., 2017; Mulkay, 2019). The reasons for these discrepancies mainly rely on the differences lying among countries, industries, combinations of demand conditions and competitions, and time periods (Negassi et al., 2019).

Based on the replication of Aghion and colleagues' empirical work (2005) and using a richer dataset of publicly listed US manufacturing firms, Hashmi and Van Biesebroeck (2016) proved that the low degree of companies' concentration within the auto industry has fostered innovation in the 1980s, thus confirming the existence of a negative relationship between competition and innovation. Later, Beneito et al., (2017) demonstrated the existence of a positive and an inverted-U relationship between competition and innovation by using data of Spanish manufacturing firms over the years 1990-2006. To explain this relationship, they introduced the possibility for inefficient firms to face the threat of exit from the market when competition intensifies in their model. More recently, Mulkay (2019) founded a linear and negative relationship using Community Innovation Survey data for French firms, in contrast to the inverted U-relationship of Aghion and colleagues (2005).

For analysis' completeness, it must be said that the controversial relationship between competition and innovation has been studied from different perspectives. A first one was focused on the economic and industrial companies' perspective (Qian and Wang, 2017; Goel and Nelson, 2018; Aghion et al., 2018). In this respect, while market competition can act as a stimulus for innovation as companies try to "escape the competition" (Federico, 2017; Brodzicki, 2019), on the other hand it can hinder innovation, as competition can erode the value of innovation (Steinmetz, 2015; Shu and Steinwender, 2019).

Further studies (Qian and Wang, 2017; Cabanelas et al., 2019) developed a wide range of models to predict companies' responses to technological competition, by focusing their attention on the specific factors affecting such relationship. For instance, the implementation of innovation processes can bear huge costs, particularly in the case of adaptability and obsolescence of existing plants. Companies' abilities to easily replicate innovations and inability to protect innovations can also discourage companies to invest in innovative activities, particularly in industries where the degree of competition is higher.

To sum up, the relationship between competition and innovation is a widely debated issue, depending on several factors. However, companies are increasingly called to address new expectations and new consumers' needs, thus making innovation imperative for their survival. While innovation is essential for companies, recent literatures (Ceschin and Gaziulusoy, 2016; Flach and Irlacher, 2018) shows that it is evolving from the past, by moving its focus from product to process innovation, as well as by switching its attention from tangible attributes to the intangible meanings that a product can communicate to the market. In this respect, in the next paragraph we will consider the increasing attention towards sustainable innovation and circular economy practices by companies.

2.2 COMPANIES AND SUSTAINABILITY

The adoption of sustainable practices and strategies has rapidly affirmed over the last decades as a compelling need for companies' survival and competitiveness. Moreover, global, national, and sectoral increasing levels of environmental pollution are highlighting the need for changing traditional production and social systems into new sustainable ones (Almeida et al., 2015). While companies play a considerable role in creating a negative environmental impact, Governments and consumers are paying increasing attention to the ways companies are responding to these issues. Additionally, the compliance with environmental regulations is extending beyond the actual companies' adoption will. For instance, the European Union (Directive 2014/95/EU)[22] requires companies with more than 500 employees to disclose information on policies and outcomes regarding their environmental and social performances. As a consequence, the concept of sustainability is becoming increasingly embedded in companies' strategies (Harmon and Fairfield, 2014; Fagerlind et al., 2019).

According to Galbreath (2009, p. 304), sustainability can be defined as a "business approach that seeks to create long-term value for stakeholders by embracing the opportunities and managing risks associated with economic, environmental, and social developments". This definition is similar to the one of sustainable development provided by Brundtland Commission (United Nations General Assembly, 1987, p.43)[23]. With regard to the concept of strategy, extant literature (Naranjo-Gil, 2016; Wijethilake and Lama, 2019) claimed that the development of

[22] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0095

[23] Sustainable development can be defined as "development which meets the needs of the current generations without compromising the ability of future generations to meet their own needs".

sustainability strategies is a process of decision-making traditionally developed by top management within companies, and which concerns directions and results in the medium-long run. More specifically, the process of planning sustainability policies is aimed at defining objectives and the related activities that companies intend to pursue in terms of sustainability commitment. Moreover, it aims at facilitating the integration of sustainability management with other business management processes (Johnson and Schaltegger, 2016; Nawaz and Koç, 2018).

In this regard, Satyro and colleagues (2017) pointed out that some of the most widespread sustainable approaches are based on similar rationale. For instance, Heikkurinen and Bonnedahl (2013) proposed a strategic approach based on Stakeholder Perspective (SP), which is aimed at achieving sustainable development by taking into account stakeholders' interests, including employees, consumers and trade associations. More recently, Lioukas et al. (2016) emphasized that companies can gain competitive advantage through an adequate management of their resources and capabilities, based on the Resource-Based View approach (RBV). Similarly, Wahyuni and Ratnatunga (2015) used the RBV to include some external and contextual factors that can influence the company, namely Resource-Based View Contingent (RBV-C). Additionally, Baumgartner and Ebner (2010), identified four different types of strategies that companies might decide to implement depending on different variables, among which can be found their general vision of sustainability, sector-specific factors, and stakeholders' interests. The four strategies have been defined as follows:

1. Introverted (risk mitigation strategy): where by focusing on external standards such as environmental and social aspects, the aim is to avoid any risk of economic sanctions for the company.
2. Extroverted (legitimating strategy): where by focusing on the external relationships that allow the company to promote an image of commitment towards sustainability, the aim is to differentiate themselves from competitors.
3. Conservative (efficiency strategy): where by adopting more efficient and cleaner production systems, the focus is on the improvement of the entire production process.
4. Visionary (holistic sustainability strategy): where by focusing on the integration of sustainability as a policy in every business activity - which could lead to innovative products - the aim is to allow companies increase their competitive advantage.

Furthermore, by integrating three of the main sustainability pillars such as economic, environmental, and social dimensions of organisational performance, the *triple bottom line approach* (Elkington, 1998) is becoming increasingly adopted by several companies operating within different sectors (Purohit, 2017; Satyro et al., 2017; Fagerlind et al., 2019). More specifically, the aim of this approach is to achieve a good balance among different goals – such as economic profit, preservation of natural resources and improvement of social well-being – while companies are moving towards the adoption of sustainable approaches (Elkington, 2008). Therefore, as explained before, companies can adopt different strategies in their policies with the aim to improve their environmental impact (Heikkurinen and Bonnedahl, 2013; Satyro et al., 2017). For example, Apple proved its commitment towards adopting a more environment-conscious policy with the launch of the iPhone 11[24] , which is made up of different materials, including 100% recycled aluminium and several recycled components for the internal mechanisms. Additionally, by allowing the owners of old iPhones to switch to new ones, Apple's trade-in system is improving, thus actively promoting the image of a company striving to improve its electrical waste collection system.

At the same time, the adoption of environmental certifications has increased in the last decades. As stated by Whelan and Fink (2016, p.6) "companies like Mars, Unilever, and Nespresso have invested in Rainforest Alliance certification to help farmers deal with climate volatility, reduce land degradation, and increase resilience to drought and humidity—all of which ensure the long-term supply of their agricultural products". In order to be able to clearly define and legitimize their sustainability efforts, several companies are, thus, following voluntary standards proposed by national and international organizations, including the International Organization for Standardization (ISO), Organization for Economic Co-operation and Development (OECD) and the Intergovernmental Panel on Climate Change (IPCC) (Bossle et al., 2016; Bowler et al., 2017).

Overall, there is no general consensus on a single perspective that can be pursued by companies in order to embed sustainability principles in strategy formulation (Egels-Zandén and Rosén, 2015; Engert et al., 2016). A common feature of the above-mentioned approaches and practices lies in the fact that their implementation requires companies to carefully analyse the competitive environment in which they operate. Prior research (Adebanjo et al., 2016; Rego et al., 2017) has widely investigated the factors affecting the implementation of such strategies

[24]Available at: https://fabrikbrands.com/eco-friendly-companies/

within companies. Social and psychological variables, such as top management culture, human resource behaviours, organisational competences and other available resources within companies are considered as primary factors that may allow or hinder the implementation of these changes (Kraus et al., 2018). Furthermore, since sustainability is a multidimensional concept whose implementation requires the involvement of several levels of decision-making and the work of different actors (including public opinion), a fundamental role is played by and adequate level of communication within companies (Genç, 2017). On a more general level, competitors and newcomers that are contending the same position within the market can influence the transition towards sustainable strategies (Morgan et al., 2018). Last but not least, socio-political factors can influence the willingness of companies to engage in such practices. Governments, as well as other institutions and organizations, can facilitate companies in this transition, by clearly indicating which are the environmental standards and objectives to be pursued, as well as by providing economic and fiscal incentives.

The following sections will provide a general presentation of the most popular sustainable approaches adopted by companies over the last decades, which can be included into the overall paradigm of the "circular economy".

2.2.1 How companies are moving towards new business models: the Circular Economy approach

Despite the concept of circular economy being rather contemporary, its origins are dated back to the early of 20th century in Boulding's study (1966), in which the Earth has been considered as a closed system (Ghisellini et al., 2016; Lieder and Rashid, 2016). This concept has been advanced by different schools of thought, including environmental economics (Turner and Pearce, 1990), industrial ecosystems (Jelinski et al., 1992), regenerative design (Lyle, 1996), industrial ecology (Graedel and Allenby, 2010), cleaner production (Stevenson and Evans, 2004), cradle to cradle design (Braungart et al., 2007), performance economy (Stahel, 2010), product-service systems (Tukker, 2015) and eco-efficiency (Haas et al., 2015). Consequently, different definitions have been offered over the years. This contemporary conceptualisation has been advanced mainly by policymakers and companies (Korhonen et al., 2018). Generally speaking, the concept of circular economy has been conceived as a model that is "restorative and regenerative by design, and aims to keep products, components, and materials at their highest utility and value at all times" (MacArthur, 2013). More specifically, it is aimed at

identifying an ideal level of loop closing to minimise the need for extracting virgin raw materials, extend products' lifecycle, maintain materials at their highest level and optimise their reuse (Lewandowski, 2016; Stahel, 2016; Webster, 2017). Switching from the traditional economic model to a circular one is increasingly attracting the attention of both Governments and companies. Notably, this model has been recently supported by the EU with €650 million, in order to facilitate the transition of companies towards more circular and sustainable approaches (EU, 2017)[25].

As for the impact of circular economy, three main winners have been identified (MacArthur, 2013; Scott, 2017): economies, consumers, and companies. National economic advantages refer to economic growth, cost savings and mitigation of price volatility and supply risks (MacArthur, 2013; Lewandowski, 2016). Consumers' benefits are mainly related to a wide range of alternatives in addition to social benefits concerning, for instance, a positive contribution against climate and economic inequalities (Trivedi et al., 2018). Finally, companies can gain economic and reputational value through new profit opportunities, increased competitive advantage, customers' loyalty, and partnerships throughout the whole value chain (MacArthur, 2013; Kumar et al., 2019). Notwithstanding its advantages, the adoption of a circular model entails several changes in companies' approaches and organizations, thus enhancing the advancement towards a new business model that allows companies to coherently integrate sustainability and economic goals, starting from traditional business models.

According to Linder and Williander (2017, p.2) a circular business model can be defined as "a business model in which the conceptual logic for value creation is based on utilizing the economic value retained in products after use in the production of new offerings" (p. 2). By linking the concept of circularity with that of sustainability, Scott (2017, p.6) provided a broader conceptualisation of circular model by stating that it can be intended as "a concept used to describe a zero-waste industrial economy that profits from two types of material inputs: (1) biological materials that can be reintroduced back into the biosphere in a restorative manner without harm or waste (i.e., they breakdown naturally); and, (2) technical materials, which can be continuously re-used without harm or waste". This conceptualization is also in line with Bocken et al. (2016)'s definition of circular business model, defined as a class of generic strategy

[25] https://ec.europa.eu/commission/presscorner/detail/en/MEMO_17_105

for the implementation of sustainable business models[26] (Evans et al., 2017; Nosratabadi et al., 2019).

Over the years, various attempts have been carried out by scholars with the aim to develop a general framework of circular business models (Lewandowski, 2016). Laubscher and Marinelli (2014) identified six key areas which could be integrated with circular economy principles within a business model:

1. Product design/material composition: it refers to the changes in product design carried out with the aim to enable products and component reuse.
2. Sales model: it concerns the provision of recovery services for products at the end of their life cycle.
3. Supply loops: it refers to the need for companies to put more efforts towards the maximization of the recovery of their products and components, as they can be reintroduced into the production cycle to realise new products.
4. Data management: it stands for the possibility for companies of keeping track of products, materials and other information related to industrial processes and how it can facilitate companies in their resource optimization processes.
5. Strategic sourcing for operations: it underlies how the trusted and long-term relationships with suppliers and customers (e.g., co-creation processes) can improve such processes.
6. Incentives to human resources: it highlights how the training and reward programmes can facilitate the adaptation of companies' culture in these structural changes.

Similarly, prior research (Joustra et al., 2013, De Jong et al.,2015) had identified five steps which could be implemented by small and medium enterprise (SMEs) that are moving toward a circular approach. The first two steps refer to a general assessment of the comprehension of the phenomenon, in order to be able to understand whether the company and the stakeholder are ready to move towards this approach along the whole supply chain. The third and fourth steps concern a general evaluation of opportunities concerning redesign; these opportunities

[26] Schaltegger et al. (2016a, p. 6) defined sustainable business models as tools for "describing, analysing, managing, and communicating: (i) a "company's sustainable value proposition to its customers, and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries."

might, indeed, derive from circular products which should be conceived in a way that facilitate their redesign. The final step is aimed at testing whether the value actually delivered to customers successfully meets their expectations and their willingness to pay.

Furthermore, the original conceptualisation of the Business model canvas (Osterwalder and Pigneur, 2010) has been further improved to include circular economy principles in all its components. More specifically:

- Value proposition: companies' value propositions must be conceived to promote circular products, which are realised with materials that allow reusing, recycling, and safe disposal.
- Channels: virtualisation of companies' processes, e.g., e-commerce and online communication, represent one of the major shifts towards the implementation of circular business models. By doing so, companies can gain social and economic benefits and, at the same time, reduce their environmental impact due to lower emissions.
- Customer relationships: strong relationships with customers can be used by companies to promote product's recycling and disposal processes and to attract new segments of consumers.
- Revenue streams: in circular business models their value may be strictly related to the value derived from products and components collected back (e.g., components restored to "as-new" quality or reused to realise other products).
- Key resources: a substitution of the traditional resources with more sustainable ones should be pursued by companies which are entering this transition. For example, products' design processes should promote the use of less raw materials and the lengthening of products' lifecycle.
- Key partnerships: collaborative networks with other companies operating in the same or similar industries can allow companies to gain benefits from suppliers, consumers, and institutions along the whole value chain. In this sense, collaborative practices can facilitate companies in obtaining key resources while enhancing their economic and social performances.
- Cost structure: companies should revise their new cost structures in the medium-long term in order to become more aware of the potential economic benefits which could derive from the adoption of such business models.

Other examples of conceptualisations of circular business models based on Osterwalder and Pigneur's approach (2010) can be identified in Dewulf (2010) and Lewandowski (2016). While Dewulf (2010) extended the Business model canvas by including environmental, business and society views, i.e. sustainability perspective, Lewandowski (2016) contextualized the original components within the circular economy framework by adding two components – namely the take-back system and the adoption factors – which, respectively, refer to a reintroduction in the industrial processes of products and components collected back from consumers and to internal and external factors that support the transition towards such models.

Although prior studies have extensively provided different examples of circular business models and related activities which can be adopted by companies, a general agreement on how to design such models is still lacking (Lewandowski, 2016; Satyro et al., 2017). Indeed, the implementation of circular models is affected by several factors at different levels, including organisational, technological, and socio-economic ones (De Mattos and De Albuquerque, 2018). Organisational factors are mainly related to hierarchical companies' systems inhibiting flexibility and innovation, changes in the mindset to long-term thinking and communication along the whole value chain (Liu and Bai, 2014; Tura et al, 2019). Technical skills and changes in companies' culture can be considered both as drivers and barriers in the process of implementation of such structural changes. Additionally, new technologies can facilitate companies towards this transition by enabling cooperation with stakeholders and information transparency (Ghisellini et al. 2016). However, they could also represent hindering factors, particularly when referring to expensive technologies which are not so affordable for companies less endowed with financial resources. Finally, global standards and Governments' support can encourage the adoption of such models through economic incentives and dedicated programmes (Tura et al., 2019).

2.2.2 From Circular Economy to Eco-design

In recent years, the concept of eco-design has become strictly connected to the one of circular economy: it has become both one of the main pillars on which circular economy stands on, both one of the core concepts around which the development of circular economy is working on in Europe (MacArthur, 2013; European Commission, 2015). Defined as the "the systematic integration of environmental considerations into product and process design" (Knight and Jenkins, 2009), eco-design is aimed at improving the environmental performance of products

throughout their whole life cycles (Directive 2009/125/EC)[27]. Similarly, Lee (2005) anticipated that eco-design is a systematic process that incorporates significant environmental aspects of a product as well as stakeholder requirements into product design and development.
Despite different conceptualisations provided by several authors over the years, the main aim of eco-design is to take into account sustainability and related issues right from the earliest stages of products' development, thus reducing the environmental impacts.
With specific regard to products' development, eco-design processes can be summarized as follows (Poulikidou, 2012; Iuga et al., 2017):

- Product improvement, which refers to an improvement in existing products through radical changes compliant with environmental regulations.
- Product redesign, which consists in rethinking existing products through the use of new technologies, keeping the product concept unaltered.
- New product design, which refers to the process of incorporating the circular economy concepts into existing products, with the aim of maintaining the initial functions the product was created with.
- New production system, which refers to the development of new products and services.

Over the years, as a result of the increasing interest in sustainable issues, several eco-design methods and tools have been developed to support companies during different stages of product design development (Rossi et al., 2016; Ahmad et al., 2018). Some of these tools consist in general recommendations aimed at improving the current environmental framework, while others suggest detailed solutions for improving products and processes' sustainability performances. For instance, Hernandez Pardo and colleagues (2011) provided a usage-oriented classification of tools based on three properties, i.e., complexity, type of tools and main function, while Bocken et al., (2014) classified eco-design tools in guidelines, evaluative, comparative, trade-off, and eco-ideation ones. Rossi and colleagues (2016) summarized the most widespread tools and approaches developed over the last twenty years with specific regard to the manufacturing industry. Among others, they identified the Life-Cycle Assessment – LCA - (ISO14040, 2006) that is a qualitative method useful to evaluate products'

[27] Available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0125

environmental performances during their lifecycles through the use of several software tools. Besides, it can be used to enable comparisons among different products and to support decision making processes. The MECO matrix (Hochschorner and Finnveden, 2003) is another environmental assessment method that can be used to estimate the environmental impact of a product with specific regards to materials, energy, chemicals on other substances involved throughout its entire lifecycle. Finally, the Design for X approach (Maxwell and Vorst, 2003) can be specifically addressed to different stages of product's lifecycle (e.g., design for manufacturing, design for recycling, design for remanufacturing).

Within this framework, it can be easily understood that the adoption of eco-design can influence every stage of the value chain. Notwithstanding the existence of a wide variety of methods and tools developed over the last decades and addressed to different sectors, including food, furniture, automotive and ICTs, a precise and detailed conceptualisation of related effects and opportunities linked to eco-design is still lacking, mainly due to the limited adaptability within different industries.

Hence, the last section of this chapter will attempt to summarise the main related benefits and challenges that companies are now called to overcome.

2.2.3 New sustainable companies' challenges

Increasing pressures from the Governments, as well as from competitors and consumers represent important factors which might trigger the adoption of eco-design practices from the companies that are continuously facing great challenges related to global warming, natural resource decline and demands for environmentally friendly goods.

In fact, the adoption of eco-design practices represents a possible solution to overcome such environmental challenges, as it positively influences companies' performances, particularly environmental, economic, and financial ones (Wakulele et al., 2016). Indeed, while on the one hand eco-design practices allow companies to reduce their environmental impact, on the other they can also help them to benefit from significant cost savings, as a result of an improvement in their operational efficiency in terms of reduced consumption of natural resources and minimization of waste, for instance.

Generally speaking, the adoption of sustainability principles and related approaches, particularly circular and eco-design ones, can lead to an improvement in companies' competitive performances (Plouffe et al., 2011; Lassala et al., 2017). As widely acknowledged

by extant literature (De los Rios and Charnley, 2017; Scarpellini et al., 2018), sustainability principles can act as a driver for innovation. In this sense, by redesigning their products in order to make them compliant with environmental regulations, circular economy and eco-design can facilitate companies in grasping new business opportunities, thus leading to further innovation both at the process and at the product level.

Nonetheless, a scant stream of literature still considers the investment in sustainability and related activities within companies as an additional cost which could negatively affect their financial performances. In this regard, Fagerlind and colleagues (2019) pointed out that despite the identification of interesting and profitable opportunities by companies, they are not able to fully capture this value mainly because this identification could not be followed by a clear and defined implementation strategy. New sustainability strategies and related approaches should, therefore, be consistent with companies' values and be in line with stakeholders' requirements (Epstein, 2018; Fagerlind et al., 2019). Indeed, an appropriate organizational structure and culture within companies can facilitate the success of such strategies, for instance through the adoption of training programmes, performance measurement, and reward systems. Moreover, a regular and continuous dialogue with stakeholders can allow companies to foresee and, consequently, better react to new social, economic, and regulatory changes. A general acceptance from consumers could also facilitate companies in the transition towards such models, particularly concerning consumers which are not so familiar with reuse and recycle practices. With regard to these latter practices, physical components of a product used during the initial stage of development can enable or hinder the implementation of such activities.

Therefore, based on the assumption that design plays a fundamental role in the initial phase of product development - as it is strictly related to the use of materials and components whose environmental impact can be evaluated - the following research questions arose in this study:

RQ1: How are furniture companies moving towards the adoption of circular and eco-design approaches?

And consequently, a further research question has been formulated as follows:

RQ2: Can sustainability be considered as a design innovation tool in supporting companies' competitiveness?

SECTION 2

RESEARCH METHODS AND FINDINGS

CHAPTER 3 – RESEARCH METHODOLOGY

CHAPTER 4 – FIRST QUALITATIVE STUDY: THE DESIGN-BASED INDUSTRY AND CIRCULAR ECONOMY. HOW DOES IT WORK IN THE ITALIAN FURNITURE SECTOR?

CHAPTER 5 – SECOND QUALITATIVE STUDY: DESIGN AND SUSTAINABILITY FOR INNOVATION. EVIDENCE OF ECO-DESIGN PRACTICES FROM A FAMILY FIRM

CHAPTER 6 – THE QUANTITATIVE STUDY: CONSUMERS' PERCEPTION OF DESIGN AND FACTORS AFFECTING THEIR PURCHASING INTENTION

CHAPTER 7 – AN OVERALL DISCUSSION OF RESULTS: CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the research methodology used in the present study along with the research approaches used for data collection, case-studies and samples selection, and data analysis processes. More in detail, this chapter provides explanation about the two main research methods employed in this study, that are the qualitative method and the quantitative one.

A brief discussion of some ethical issues concludes the chapter.

3.2 QUALITATIVE, QUANTITATIVE AND MIXED METHODS APPROACH: A GENERAL PERSPECTIVE

In literature, quantitative and qualitative approaches are presented as two different paradigms through which studying the social reality. The origin of the term "paradigm" can be traced back to the history of philosophical thought, when Plato and Aristotele used it, respectively, in the sense of "model" and "example" (Corbetta, 2014). More recently, it was used with different meanings: it goes from synonym of "theory", to an exemplary research process, to an equivalent of "method". According to Khun (1962), the term "paradigm" indicates a theoretical perspective that is:

- commonly recognized by the scientists of a specific discipline,
- based on earlier acquisitions of the discipline itself,
- carried out through different steps, such as: (i) identification and selection of relevant facts to be studied; (ii) development of hypotheses for the explanation of the observed phenomenon; (iii) preparation of the necessary empirical research techniques.

Within the specific context of social research, two main paradigms guided the development of empirical studies, namely *Positivism* and *Interpretivism*.

Positivism has its origins in the mid-nineteenth century, when people began to question themselves and to study social issues. As pointed out by Corbetta (2014, p. 21), the positivist paradigm is defined as "the study of social reality through conceptual apparatuses, observation and measurement techniques, mathematical analysis tools, inference procedures of the natural sciences". In particular:

- conceptual apparatuses refer to the categories of "natural law", "cause effect", and "empirical verification",
- observation and measurement techniques refer to the use of quantitative variables also for qualitative phenomena and the measurement procedures for ideological orientations, mental abilities, and psychological states,
- mathematical analysis tools refer to the use of statistics and mathematical tools for data analysis and processing,
- inference procedures refer to the process that allows to advance hypotheses on the unknown starting from the known (i.e., the transition from particular observation to the general law), the use of theory for forecasting purposes, and the inference from a sample to the universe.

In other words, *Positivism* lays its foundation on the general assumption that there exist universal laws that govern social events, whose understanding allows researchers to describe, predict, and control social phenomena (Corbetta, 2014).

Positivism saw its origins in France and Great Britain, while the most radical and organic criticism to this approach came from the context of German historicism. In the late 19th century, Dilthey (1883), while accepting the rigorous scientific criteria of *Positivism*, clearly highlighted the distinction between the "natural sciences" and the "human sciences" based on the difference between the researcher and the observed reality. While in the natural sciences the object of the study is the external reality, which implies a detachment of man from reality, in the human sciences the knowledge can be gained only through a process of understanding that directly involves the researcher, thus neglecting any separation between the researcher and reality. In a similar vein, Windelband (1894) takes on an even stronger position against *Positivism* by drawing a clear distinction between the "nomothetic sciences", aimed at

identifying natural laws, and the "idiographic sciences", aimed at grasping the individuality of the observed phenomena (Corbetta, 2014).

Starting from the above criticism, it is thanks to the German sociologist Max Weber (1949) that a new perspective, namely *Interpretivism*, entered the sociological field. Unlike Dilthey (1883) and Windelband (1894), he claimed that the distinction between natural and human sciences is represented by a specific orientation towards individuality. In other words, this perspective seeks to understand values, beliefs and meanings underlying human behaviours. As a consequence, *Interpretivism* requires the adoption of its own research procedures and observation techniques, differently from the "language of variables" which had been used until then.

Table 3.1 summarizes the main differences associated to the research paradigms of *Positivism* and *Interpretivism* based on Lincoln and Guba (1985) and Corbetta'(2014) studies.

Table 3.1 – Positivism and Interpretivism

Positivism	*Interpretivism*
Objectivity of the social reality.	Reality consists of different subjective meanings.
The aim of the research is to understand the laws underlying human behaviours, similarly to the understanding of laws that govern the physical world from scientists.	The aim of the research is to gain insights about respondents' lives, through a deeper understating of the motivations underlying their behaviours.
Use of *quantitative* methods as they allow the researcher to be detached from the respondents.	Use of *qualitative* methods as they allow a close interaction between the researcher and the respondents.
Objective meanings.	Subjective meanings.

Source: personal elaboration based on Lincoln and Guba (1985) and Corbetta (2014).

As shown in Table 3.1, two different research methods have been associated to the above research paradigms, namely quantitative and qualitative methods. The first one requires the researcher to be detached from the respondents, while the second one implies a close interaction between the researcher and the respondents themselves.

During the last century, the debate between quantitative and qualitative research in the sociological field has deeply evolved. After a lively confrontation during the 1920s and 1930s, when the two approaches significantly contributed to advancements in the research field, the debate came to a latency phase. This period, which lasted from the 1940s to the 1960s, was characterized by the domination of the quantitative perspective. Furthermore, qualitative research was regarded as an "illegitimate daughter" of social science and the researcher was considered as a good journalist (Corbetta, 2014).

In the 1960s, the debate was rekindled thanks to relevant theoretical contributions provided by some scholars (Goffman, 1959; 1967; Schutz, 1967; Glaser and Strauss 1967; Blumer, 1969). It was only from the 1980s onwards that the qualitative approach affirmed its relevance, both in the methodological debate and the empirical research (Corbetta, 2014).

Table 3.2 summarizes the main characteristics of the two methodologies based on Corbetta (2014) and Antwi and Hamza' (2015) studies.

Table 3.2 – Quantitative and qualitative research: a comparison

	Quantitative research	*Qualitative research*
Theory-research relationship	Structured, logically sequential phases	Interactive, open
Role of the literature	Fundamental for the definition of theory and hypothesis	Auxiliary
Concepts	Operativized	Orientative, open
Psychological interaction between researcher and observed subject	Scientific, detached, and neutral observation	Empathetic identification
Physical interaction between researcher and observed subject	Distance, separation	Proximity, connection
Research design	Structured, closed. It precedes the research	Destructured, open. It is built during the research
Representativeness	Statistically representative sample	Individual cases, non-statistically representative
Nature of data	Objective and standardized	Subjective, rich, and deep
Subject of analysis	Variable analysis	Subject analysis
Objective of the analysis	Explanation of the variance of variables	Understanding of the subjects
Use of mathematical and statistical techniques	Intensive use	No use
Scope of the results	Generalizability	Specifity

Source: personal elaboration based on Corbetta (2014) and Antwi and Hamza (2015).

More recently, the adoption of mixed-method approaches, based on both qualitative and quantitative studies, has become increasingly popular in the social sciences. As pointed out by Tashakkori and Creswell (2007), this approach combines quantitative and qualitative methods in different ways, thereby providing researchers additional valuable tools to their resources. More specifically, a mixed-method approach:

- can address different types of research question,
- allows to analyse different types of data (e.g., textual and numerical),
- provides different types of interpretations and conclusions (e.g., objective and subjective).

Similarly, Gay and colleagues (2009) defined mixed-methods research as those studies that combines different methods by including both qualitative and quantitative data in a single research study.

Despite the existence of different definitions provided over the years, there is not yet a widely shared conceptualization of the mixed-method approach, as this field is still developing (Ponce and Pagán-Maldonado, 2015). In the present study, the definition provided by Tashakkori and Creswell (2007, p.4) was adopted: "a research in which the investigator collects and analyses data, integrates the findings and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry."

Since the selection of the method should depend on the fitness for purpose (Tuli, 2010), qualitative and quantitative methods have been used in different research steps of this study, according to the specific research questions proposed.

3.3 RESEARCH QUESTIONS AND STEPS OF THE ANALYSIS

The overall aim of the present study is to investigate whether and how design can be considered as a source of competitive advantage during the current and in the future economic scenario. More specifically, in order to accomplish this aim, the following research questions have been developed:

RQ1: How are furniture companies moving towards the adoption of circular and eco-design practices?

RQ2: Can sustainability be considered as a design innovation tool in supporting companies' competitiveness?

As assumed in the previous chapters and thoroughly discussed later in this thesis, the above issues are still debated in the literature, and prior research often appears lacking empirical findings or providing inconclusive ones. Hence, a qualitative method was preferred in this step (*Chapter 4* and *5*), as it properly fits with the exploratory purposes underlying the above research questions.

The second step of the study aims at investigating the consumers' perspective (*Chapter 6*). After having analysed the companies' attitudes and behaviours towards sustainability and the adoption of sustainable innovation into eco-design practices to support their long-term competitiveness, the study focused on consumers by investigating the role of design in their decision-making and purchasing processes. Since the design concept has been often

categorised in various dimensions (i.e., functional, aesthetic, and symbolic), which can be differently perceived by consumers and impact on their intentions and behaviours, this step aims at addressing the following research questions:

RQ3: How do consumers perceive the different dimension (i.e., functional, aesthetic, symbolic) of design? Which attributes most affect their perception?

RQ4: To what extent the design attributes (functional, aesthetic, symbolic) impact on consumers' purchasing intention?

Finally, considering the increasing attention of consumers towards environmental issues, the last research question arose as follows:

RQ5: To what extent consumers' environmental concerns influence their perception of design attributes and the purchasing intention of design furniture products?

Notably, this last step of the research aims at achieving a better understanding of how consumers' environmental concern can affect their purchasing intention of design furniture products. The adoption of a quantitative approach was selected as it allows a better generalisation of the results.

In the following sections, further explanations of the methods and specific techniques used in the two steps of the analysis will be provided.

Before starting, a further explanation concerning the setting of analysis that was selected for this study is needed. Both qualitative and quantitative studies have been focused on the furniture sector for several reasons. Firstly, the furniture industry has been recognized as a design-intensive sector, as it heavily relies on the creativity that designers bring out during the development of new products (Dell'Era and Verganti, 2010; Magistretti et al., 2019). Moreover, the Italian furniture sector is considered worldwide as an avant-garde expression of design.

Secondly, the importance of design-intensive companies, particularly furniture ones, is widely acknowledged. The Italian furniture sector constitutes, along with the automotive, apparel and food industries, one of the cornerstones of the Made in Italy, with more than 75,000 companies and over 314,000 employees distributed throughout Italy[28]. In 2018, it generated revenues of around € 42,3 billion, up 1.8% on 2017 and accounted for the 4.7% of the Italian manufacturing industry (Table 3.3).

[28] Rapporto FederlegnoArredo (2019). Available at: https://www.federlegnoarredo.it/it/servizi/centro-studi-dati-e-ricerche/tutte-le-news/tutte-le-news/online-rapporto-federlegnoarredo-2018

Table 3.3 - Composition of the Italian Furniture sector

	Companies	*Employees*	*Turnover*
Capital companies	16,618	188,985	38.0 B
Artisan companies	58,126	125,396	4.3 B
Total	*74,744*	*314,381*	*42.3 B*

Source: personal elaboration based on Rapporto Federlegno Arredo (2019).

Notably, exports account for 51% of the total production: France (24.02%) and Germany (17.62%) are the main destinations, followed by the United States (14.24%). Among other countries attracted by the Made in Italy furniture, the United Kingdom is in the fourth place (12.31%), followed by Switzerland (7.37%) and Spain (6.09%). China has a share of 6.06%, Russia of 4.95%, Belgium of 3.87% and, finally, Austria has a 3.46% share.

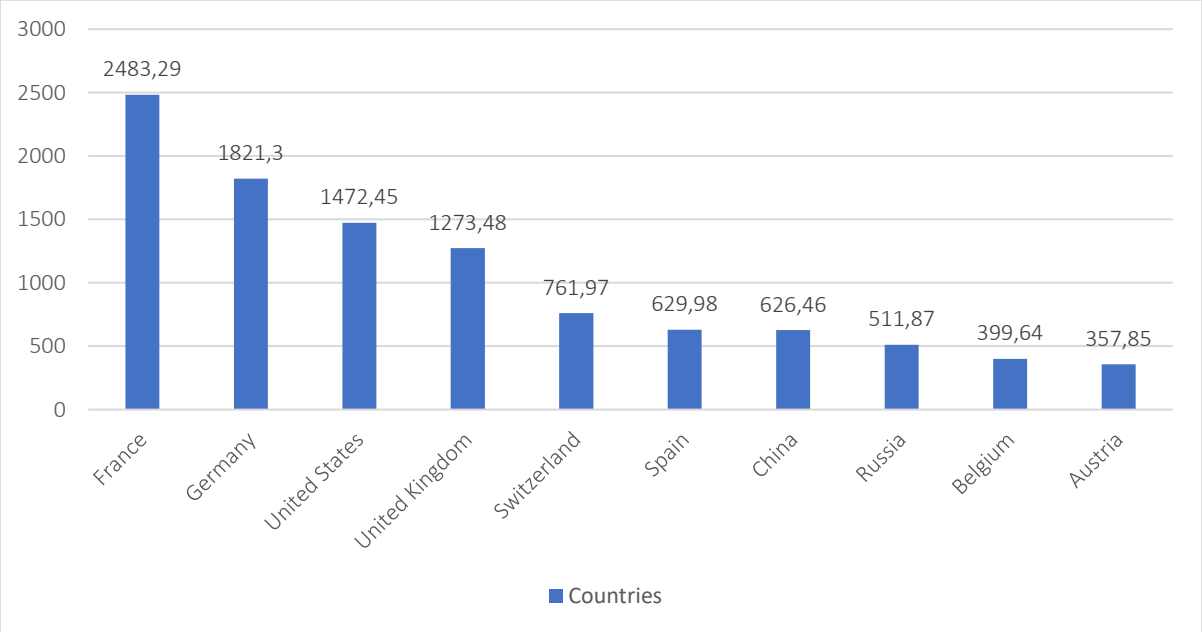

Figure 3.1 - Italian furniture exports: top 10 destination countries (values in millions of euros)

Source: personal elaboration based on Rapporto FederlegnoArredo (2019).

Thirdly, the furniture sector appears to be particularly important from an environmental standpoint. In fact, it is characterized by an intensive use of raw materials and the large use of adhesive, dyes and coating materials results both in emission of large volume of volatile organic compound and waste production (Azizi et al., 2016). In this regard, the large employment of natural resources suggests a compelling need for companies to move towards the implementation of sustainable practices with the aim to reduce both the environmental and the social impact of their production processes (González-García et al., 2011). Furthermore, the

adoption of eco-design practices can help companies to optimise all stages of their value chains in a sustainable way, from the design phase to the distribution one (Petit et al., 2018).
Lastly, the fact that my Ph.D. has been carried out within a furniture family company, belonging to the Italian furniture district of Pesaro, facilitated the process of gathering information.

3.4 STEP ONE: THE QUALITATIVE STUDY

3.4.1 Introduction

The use of qualitative research can be observed in all social sciences and applied fields. It is considered as an effective method for the researchers to obtain an in-depth understanding of the social reality of natural settings – being it highly involved in the observed experience (Creswell, 2003).
Qualitative research is based on different methodologies and techniques, such as case-study, ethnography, participant observation, and phenomenological research (Yilmaz, 2013). However, it has been largely criticised for different reasons, including lack of scientific rigour, reproducibility, and generalisability (Patton and Appelbaum, 2003). Two main criteria are usually applied to qualitative research to deal with some of the above-mentioned limits, i.e. *credibility* and *dependability* (Lincoln and Guba, 1985; Gibbs, 2007). The concept of *credibility* is strictly related to the thoroughness of the study findings, which have to be valuable for both the researchers and the participants (Creswell and Miller, 2010). On the other hand, the concept of *dependability* refers to the consistency across different researchers and methods over time (Gibbs, 2007; Miles and Huberman, 1994).

3.4.2 Case study methodology

In this thesis, the case study methodology has been adopted to investigate the companies' awareness about the strategic use of design, especially with regards to eco design and sustainable approaches (RQ1, RQ2). This approach revealed itself to be particularly suitable also to understand to what extent the adoption of a sustainable approach by companies can contribute to fostering their innovative performances.
A general overview of the methodology adopted will be useful to understand the reasons underlying this rationale.
The history of the case study methodology has been characterized by different periods of intense use and disuse. Its origins can be traced back to the 20th century when it was used

mainly in psychophysics and medicine fields. The public dispute which took place in 1935 between Columbia University's scholars and the Chicago School marked a decline of the case study methodology as a scientific research method (Tellis, 1997). After a period of successful adoption of the quantitative methods, in the 1960s, researchers became increasingly aware of their limitations. Hence, a renewed interest in case study methodology occurred (Tellis, 1997). Over the years, several definitions of such a methodology have been provided by researchers. For instance, Eisenhardt (1989, p. 534) defined a case study as a "research strategy which focuses on understanding the dynamics present within single settings", while Yin (1984, p. 23) defined it as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used". Generally speaking, it can be said that they both focus on the methods and techniques of a case study. In contrast, Stake (1998) claimed that the methods of inquiry used are not crucial for the case study research.

In an attempt to classify some of the definitions provided over the years, Starman (2013) highlighted that the differences observed between these definitions derive mainly from the criteria on which the classifications are based. More specifically, she refers to:

- the subject of the study, i.e. the phenomenon to be investigated,
- the object of the study, i.e. the analytical framework within which the subject is analysed,
- the case selection, i.e. the selection of subjects (individual or companies) to be analysed (e.g. single case or multiple cases).

According to Yin (1984), one of the main strengths of this methodology lies in its ability to deal with a full variety of evidence – documents, artefacts, interviews, and observations. More recently, George and Bennett (2005) identified four additional advantages of adopting this approach:

- conceptual validity: it refers to the identification of the indicators used by the researcher to introduce the theoretical framework of the study,
- development of new hypotheses: it refers to its suitability for the identification of new variables and assumptions with inductively reasonings,

- exploration of causal mechanisms: it refers to its suitability for in-depth analysis of causal mechanisms in individual cases,
- modelling and understanding of complex causal relations: it refers to its suitability for investigating different types of relations (e.g., complex interaction effects and path dependency).

Prior research (Vissak, 2010; Gustafsson, 2017) had also debated the similarities and differences between single case studies and multiple case studies. If on one hand Langley (1999, p. 699) stated that "this strategy provides a powerful means of deriving insights from a single rich case", on the other side Yin (1984) and Eisenhardt (1989) provided considerable evidence of its effective use in multiple case studies. More specifically, they agreed on the fact that multiple case studies approach allows researchers to increase the overall robustness of the study, by comparing similarities and differences within cases, and thanks to the use of the replication logic.

Despite the use of the case study methodology being widely spread and recommended (Gerring, 2004; Flyvbjerg, 2006; Barratt et al., 2011), Yin (1984) identified three main weaknesses that can sometimes occur, such as (i) lack of rigour, (ii) very little basis for scientific generalisation, and (iii) long duration that can lead to inconclusive results. In fact, lack of rigour concerns equivocal or biased evidence, which can influence the direction of the findings while the low degree of generalisability is related to the small number of subjects analysed. Lastly, the long duration of the process can lead the researcher to obtain a consistent amount of misleading information.

Considering the above strengths and weaknesses, the case study methodology was selected for the first step of the present research for a twofold reason. Firstly, because of its effectiveness in understanding and revealing contemporary phenomena on which there are few empirical works. In fact, despite the interest towards circular economy and the eco design approach has rapidly grown over the last decades, the knowledge about these contemporary phenomena highlights potential gaps in their understanding – given their early stage of development (Ghisetti and Montresor, 2018; de Carvalho Araújo et al., 2019). Several authors have, thus, suggested how the case study methodology can successfully assist researchers in compensating for the lacking literature, and have recognised it as the most appropriate

methodology in an exploratory theory building approach (Eisenhardt, 1989; Strauss and Corbin, 1998; Yin, 1994).

The second reason is strictly related to the aim of this study, which is to investigate how the design should be managed by companies in a furniture setting in order to be able to sustain competitiveness through a perspective that takes into account the opportunities deriving from eco-design. This implies an in-depth analysis of the processes through which sustainability and eco design are implemented by companies. The case study method, as claimed by Grønhaug and Olson (1999), supports in-depth descriptions, thus providing the opportunity to obtain an intimate understanding of a company's process, both in a contextual and historical dimension (Yin, 1994; Tellis, 1997).

3.4.3 Case study procedures: selection of cases

The adoption of the case study methodology, based on both single and multiple cases, requires firstly a careful selection of cases.

Several criteria for addressing this issue have been provided by different scholars (Yin, 1984; Eisenhardt, 1989; Tellis, 1997). Yin (1994) proposed three main criteria for case study selection, namely convenience, access, and geographic proximity. A consistent stream of literature (Yin, 1984; Eisenhardt, 1989; Stake, 2000; Eisenhardt and Graebner, 2007) also argued about the number of cases that are required to obtain representative and significant findings. Notably, Eisenhardt (1989, p. 545) claimed that "a number between four and ten cases usually works well", while Yin (1994) stated that single cases are suitable to confirm or challenge a theory, or to represent a unique or extreme case. Conversely, Stake (2000) argued that the number of cases must be determined in accordance with the overall purpose of the study, thus neglecting the need to identify a precise number.

In the present research, four companies operating in the Italian furniture sector were chosen in order to analyse how much they know about eco-design and circular economy, the sustainable practices they actually adopt and, therefore, to what extent they perceive the opportunities related to the eco-design approach (RQ1). The multiple case study has been here adopted in order to obtain a clearer understanding and characterisation of the investigated phenomenon, by comparing similarities and differences among companies (Andreu et al., 2010). As it will be explained later, some experts were involved to support the selection of case studies for this research.

Next, the use of a single case study approach has been adopted for exploring the adoption of sustainable practices for innovative purposes within companies (RQ2). In this respect, the furniture company where I attended part of my Ph.D. scholarship has been deeply analysed, on the basis of a thorough investigation of how and why innovative eco-design practices are implemented along the company's value chain.

A more detailed description of the analysed companies, both in the multiple case study and in the single case study, along with the criteria used for their selection will be provided in *Chapter 4* and *Chapter 5*, respectively.

3.4.4 Case study procedures: data collection and interviews

Different sources for data collection have been identified in qualitative research (Denzin and Lincoln, 1994; Yin, 1994; Stake, 1995; Marshall and Rossman, 2006). Yin (1994) and Stake (1995) proposed the use of the following potential sources:

- documentation, which refers to letters, agendas, administrative documents, and newspaper articles,
- archival records, which refer to organizational records, survey data and other such records,
- several forms of interviews, which can be open-ended, focused, or structured or semi structured,
- physical artifacts, which refer to the tools or some other physical evidence that the researcher may have the access to,
- direct observations, which refer to the direct inspections conducted during the case study,
- participant-observations, which refer to those situations where the researcher is an active participant of the phenomenon under investigation.

The use of multiple data suggests that the case study approach can be considered as a triangulated research strategy, as it involves different sources and evidence. In this respect, Yin (1984) pointed out that the use of multiple sources of data allows to enhance the validity and reliability of the overall research process.

Accordingly, in this thesis different methods for data collection were adopted.

Concerning the multiple case study, an open-ended questionnaire was primarily used. This has been directly submitted to companies, starting from November 2018 until February 2019 (*see Appendix A*). The questionnaire was structured in three sections aimed at investigating different aspects:

- the background of the company,
- the companies' approach towards sustainability and circular economy issues, with a focus on the implemented practices and related enabling/hindering factors,
- the use and the role of environmental certifications within both the companies' communication strategies and the overall sustainable approach.

Each interview lasted about two hours and was conducted in Italian language. Afterwards, it was transcribed into English. When processing the collected data, the Eisenhardt and Graebner's guidelines (2007) of within-case and cross-case analysis were followed to compare similarities and differences among the companies analysed.

The primary data concerning the single case study were collected through in-depth interviews performed from January 2018 to May 2019. Respondents were asked to answer to multiple open-ended questionnaires (Schmidt and Hollensen, 2006). Additional questions were administered when necessary, to achieve further insights on specific topics.

An interview guide has been created (see *Appendix B*), that was structured into four sections: (i) company's profile; (ii) information about innovation activities; (iii) information about company's approach towards environmental issues; (iv) information about the development and the success of a specific eco-design innovation. All the interviews were conducted, recorded, transcribed in Italian language, and then translated into English. They lasted for approximately two hours.

In order to increase the reliability of both qualitative studies, several documents provided by companies, including industry conference proceedings and archival reports, were examined. Moreover, a review of their websites and their profiles on different social media platforms was carefully conducted.

3.5 STEP TWO: THE QUANTITATIVE STUDY

3.5.1 Introduction

Quantitative research is aimed at explaining social phenomena through numerical data which are analysed by means of mathematical methods, particularly statistics (Gay and Airasian, 2000; Creswell, 2003). It assumes that social and psychological phenomena are based on an objective reality that is independent of the subjects involved in the study. Hence, this approach requires the use of pre-constructed tools and pre-determined categories of responses from researchers. One of the main advantages of using this method lies on the fact that it allows the measurement of participants' responses to a predetermined set of questions, thus facilitating the analysis of the data. More specifically, this method allows the researchers to obtain broad and generalisable findings, and to present them in a synthetic manner. However, given their generalisability, the results fail to provide insights about participants' feelings, thoughts, and experiences in their own words (Muijs, 2004).

To cope with some of the above-mentioned limits, two main criteria are usually proposed aimed at improving the results' effectiveness, namely *reliability* and *validity* (Keppel, 1991; Huck, 2000; Trochim, 2005). The concept of *reliability* refers to the consistency or the degree to which a research tool allows to measure a given variable in a consistent way each time it is used for the same aim and conditions, while *validity* refers to the accuracy of the research data themselves.

3.5.2 Survey methodology

In the second phase of the present study, a quantitative research was developed with the aim of investigating the role of design in consumers' decision-making and purchasing processes within the specific context of the furniture sector (RQ3, RQ4, and RQ5).

According to Groves and colleagues (2011), the earliest type of survey is the census, generally used by Governments to understand a social problem. However, the origins of modern survey research are traced back to Booth (1903), who collected data on the poverty of London, by using no-standardized questions. Notably, the findings of Booth's study were presented using quantitative summaries deriving from systematic measurements.

It was only over the early 20th century that the survey methodology has been increasingly adopted, both by Governments and companies, to gain empirical evidence of people's daily lives and behaviours, based on a fixed set of questions and observations.

In the early '90s, Pinsonneault and Kraemer (1993) defined the survey methodology as a mean to gather information about the actions, characteristics and opinions of a large group of people. Similarly, Isaac and Michael (1997, p.136) stated that survey research is used "to answer questions that have been raised, to solve problems that have been posed or observed, to assess needs and set goals, to determine whether or not specific objectives have been met, to establish baselines according to which future comparisons can be made, to analyse trends across time, and generally, to describe what exists, in what amount, and in what context".
In this regard, Weisberg (2008) identified several reasons for adopting the survey methodology, including its suitability to:

- measure present respondents' attitudes, beliefs, and behaviours,
- measure changes occurred over time in respondents' attitudes, beliefs, and behaviours,
- obtain predictions from respondents, intended as their beliefs about the future,
- examine differences between groups.

Despite several scholars widely recommended the use of this methodology (Gable, 1994; Groves et al., 2011; Nardi, 2015), Weisberg (2008) pointed out that survey methodology is weak for identifying general causation between different opinions of respondents, as it mainly measures individual opinions. Besides, Glasow (2005) claimed that respondents can intentionally misreport their answers to hide inappropriate behaviours or to confound the survey results.
After considering the above opportunities and limitations, in the second phase of the present study the adoption of the survey methodology revealed its usefulness in explaining the existing relationships between different variables through a deeper understanding of respondents' opinions and behaviours – as we will see in the next section.
Based on Groves et al. (2011) and Fowler's (2013) recommendations, the survey process started from the definition of the research objectives and constructs. In this regard, the role of consumers' environmental concern was also investigated, in order to understand whether and how it can affect the purchasing intention of design furniture products. The questionnaire design and the sampling procedure were, thus, developed. Finally, the analysis of results was performed using the statistical software SPSS (version 23) and WarpPLS (version 7.0).

3.5.3 Questionnaire design

As for the questionnaire design, it can be primarily useful to show a general overview of the different methods of data collection.

In this respect, Corbetta (2014) identified three main methods:

1. telephone surveys: the interviewer contacts the respondents by phone, asking them a series of questions. In this case the interviewer, in addition to recording the answers, can provide further explanations regarding unclear questions,
2. personal surveys: the interviewer personally meets the respondents and gather answers through face-to-face interviews. In this case, the interviewer records the answers in real time,
3. postal surveys: the interviewer sends the paper questionnaire to preselected potential respondents by postal service. The respondents fill it in and send it back. In this case no external subjects between respondents and answers are involved.

Notwithstanding these methods being still widely used, the growing access to the web and to computer-mediated communications resulted in an increasing use of online surveys by researchers (Dewaele, 2018). Indeed, quantitative surveys based on structured questionnaires can be easily submitted to respondents:

- via e-mail when the address is known,
- via social media platforms when the address is unknown.

As pointed out by several scholars (Wright, 2005; Schmidt and Hollensen, 2006), the online questionnaire shows several advantages, such as: access to unique populations, cost-effectiveness in administration, ease in creating and posting through the web and possibility to get online, and flexible statistical analysis.

Concerning the present research, an online questionnaire was built through the web platform "Google Modules", both in Italian and English languages. It was made up of both closed-ended and structured questions and required approximately half an hour to be filled in (*see Appendix C*).

The link to the questionnaire was distributed to potential respondents through social media platforms, emails, and online communities. Several questionnaires were also distributed outside some furniture stores, in order to achieve a greater number of respondents.

3.5.4 Sampling process, data collection and analysis

As concerning the sampling procedure, this study involved a random sample of Italian people. The questionnaire was distributed by using both the online and the offline procedure. After a first submission in June 2019, several reminders were sent every three weeks until March 2020; meanwhile a number of filled-in questionnaires were collected outside furniture stores. A total number of 357 respondents completed the questionnaire. However, after the answers were examined, the sample has been reduced to 350 units.

The analyses - along with the interpretation of the data - were carried out using different statistical software, such as SPSS Statistical package (version 23) and WarpPLS (version 7.0). These allowed to perform statistical analysis, including descriptive statistics, factorial analysis, regression analysis, and structural equation modelling (SEM).

More in detail, after analysing the demographic characteristics of the respondents, a preliminary Factor Analysis, based on the Principal Component Analysis (PCA) method, was carried out to investigate the main attributes of design which affect consumers' perception. Then, a regression analysis was performed to assess whether and how consumers' purchasing intention of design furniture products is affected by their perception of design attributes. Finally, a structural equation model (SEM) analysis was developed to deepen the relationships between design and purchasing intention by investigating the role of consumers' environmental concerns.

The general theoretical framework along with method details and the research findings will be better discussed in *Chapter 6*.

3.6 ETHICAL CONSIDERATIONS

The present study was developed in accordance with certain ethical issues (Bryman and Bell, 2007). All the participants involved in the studies were fully provided with the necessary information regarding the objectives of the research. At the same time, they were assured that their answers were treated in a confidential way and used only for academic purposes. During the development of the present thesis, the participants were not abused or harmed, both

psychologically and physically. On the contrary, all participants gave their written consent regarding their involvement in the research project, by providing a signed Consent Letter and a Withdrawal Letter whose aim was to respect the will of participants and to give them the possibility to withdraw from the study for any reason and at any point of the study.

CHAPTER 4

FIRST QUALITATIVE STUDY:

The design-based industry and Circular Economy. How does it work in the Italian furniture sector?

4.1 INTRODUCTION

Starting from the assumption that consumers and companies, as well as public institutions, are paying increasing attention towards sustainability and environmental issues (Harmon and Fairfield, 2014; Watkins et al., 2016; Fagerlind et al., 2019), the role of design for companies' competitiveness was analysed, in this step of the research, through the lens of the circular economy paradigm (Ghisellini et al., 2016; Lieder and Rashid, 2016). This perspective provides a broader connotation of the concept of design, thus highlighting the importance of creating products with both aesthetic, functional, and environmental values.

The circular economy paradigm also suggests new opportunities for a strategic management of the design, thus revealing new prospects for companies' competitiveness. Nevertheless, to the best of the authors' knowledge, there is a lack of contributions examining the circular economy concept among the furniture companies (de Carvalho Araújo et al., 2019). Extant literature has investigated topics related to the concept of circular economy, such as the role of eco-design (Bovea and Vidal, 2004; Mirabella et al., 2014), the increasing use of recycling raw materials (Addis and Schouten, 2004) and the growing adoption of renewable energies by furniture companies (Daian and Ozarska, 2009; González-García et al., 2011). Certainly, these topics are strictly related to the concept of circular economy, yet little is known about other practices, such as the recovery/reconversion of waste materials to create new products on which circular economy lays its foundations (Yuan et al., 2006).

Therefore, the main objective of this study is to explore to what extent furniture companies are aware of the circular economy principles, how they are implemented within them and which factors can influence their adoption. In this way, the research contributes to address a gap, already been recognized in the literature, concerning the overall lack of knowledge on circular

economy concept and characteristics, since it is still on its early stage of development (de Carvalho Araújo et al., 2019).

At an operational level, the study also explores quality management practices and product certifications, since they can be particularly helpful for managers in implementing environmentally sustainable practices, which, in turn, are critical within a circular business context (Rusinko, 2005).

The findings add further knowledge to the scientific debate on circular economy, specifically concerning the furniture business. Moreover, practical implications for companies derive from the analysis of factors affecting the adoption of circular economy practices and product/process certifications, which are particularly useful for those who are moving towards circularity.

The rest of this Chapter will provide the results of the multiple case-study investigation; these will be supported by a specific literature analysis on the concept of circular economy and environmental management practices. Several parts of this Chapter were drawn from an article published in 2019 by the international journal *Sustainability*[29], co-authored by Laura Bravi, Elisabetta Savelli and me.

4.2 LITERATURE BACKGROUND

4.2.1 The Circular Economy: a new business model

Over the last decades, the growing attention to global environmental risks and the related consequences which are threatening humanity's survival (e.g., global warming, acid rain and resource depletion) has triggered a considerable interest towards the development of new business models (Rockström et al., 2009). In this new challenging global scenario, the concept of circular economy has gradually raised and obtained increasing attention both on companies and Governments' agendas (Brennan et al., 2015).

For example, China and Japan have recently engaged in circular economy activities with two legislative acts, namely, respectively, "Circular economy Promotion Law of the People's Republic of China" (Lieder and Rashid, 2016) and "Basic Law for Establishing a Recycling-Based Society" (METI, 2004); in the meantime in Europe, the concept of circular economy has been

[29] Barbaritano, M., Bravi, L., & Savelli, E. (2019). Sustainability and quality management in the Italian luxury furniture sector: A circular economy perspective. *Sustainability*, *11*(11), 3089.

promoted through the "Waste Directive 2008/98/EC" (He et al., 2013) and the more recent "Circular economy Package" (European Commission, 2014)[30].

The origins of the concept of circular economy can be traced back to Pearce and Turner (1989) in the late '80s, when they argued that the traditional open-ended economic system – based on the paradigm "take, make and dispose" - paid scarce attention on environmental issues (Ness, 2008). Therefore, they proposed a closed-loop system with the aim to promote harmony between the ecosystem and the economic system. In a similar vein, Yuan and colleagues (2006, p. 5) stated that "the core of [the circular economy] is the circular (closed) flow of materials and the use of raw materials and energy through multiple phases". More recently, the Ellen MacArthur Foundation (MacArthur, 2013, p. 14) defined the circular economy as "an industrial economy that is restorative or regenerative by intention and design". Nowadays, this latter definition has been recognised as the most renowned (Geissdoerfer et al., 2017); hence it has been taken into account in this study. In particular, it proposes the circular economy as a new business model, useful to achieve a sustainable development and a fair society (Ghisellini et al., 2016; Murray et al., 2017), where the concept of "end-of-life" is replaced with that of reducing, reusing and recycling activities, both in production and in consumption processes (Figure 4.1).

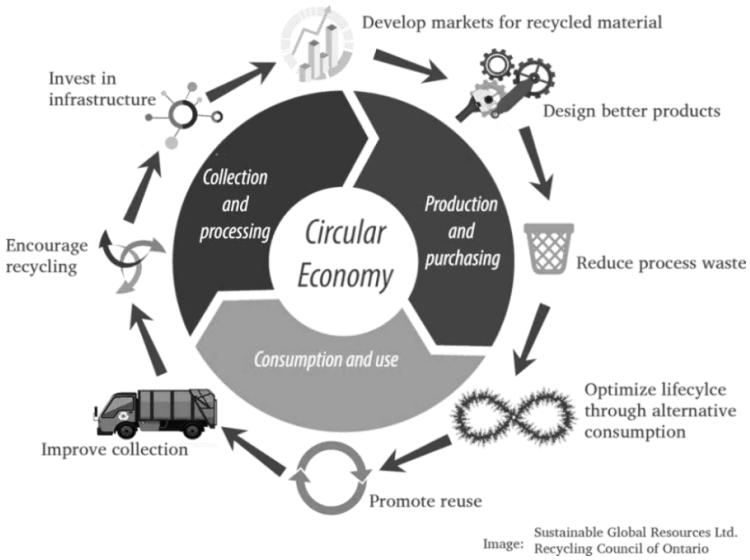

Figure 4.1 - The Circular Economy Model

Source: https://iceclog.com/profitable-shift-to-circular-economy-for-manufacturers-and-retailers-monetize-waste-boost-sales-while-saving-the-environment/

[30] Available at: https://ec.europa.eu/commission/presscorner/detail/en/MEMO_14_450

Similar to the concept of sustainability, the one of circular economy is based on a global perspective and highlights the need for a better integration between economic, environmental and social dimensions with the aim to fulfil both Governments and companies' expectations. Thus, it can be said that the circular economy is an alternative way to follow in order to reinterpret the traditional economic system with sustainability principles in mind (Rashid et al., 2013).

Economic and financial resources are needed to facilitate the implementation of such a business model within companies (Wang et al., 2008). Moreover, companies should own proper skills and adopt effective information systems aimed at managing and planning reduction, reuse, and recycle activities (Geng and Doberstein, 2008). For these reasons, companies and, more general industries which decide to move towards the implementation of this approach, should reorganize their whole value chains, in a way that a more sustainable use of resources and waste management can be effectively pursued. Last but not least, given the consumers' critical role in the market, the redesign of companies' value chains should consider the degree of consumers' awareness about environmental and sustainability issues.

Despite the fact that these changes may prevent the adoption of circular economy models by companies, several positive effects on the economic, environmental, and social dimensions can be achieved through their practical implementation (Geng et al., 2012). For example, companies can benefit from a reduction in their costs, resulting from an increase in the re-use activities of materials, while enhancing their competitiveness thanks to a decrease in the consumption of raw materials and to the effects related to prices volatility (Rizos et al., 2015). The use of proper infrastructures for waste treatment enables companies to convert their waste streams into income ones (McKinsey, 2016). Moreover, companies engaging in such practices could gain additional benefits from selling their waste streams to other companies that are able to use them in different ways, for example through reuse or recycling activities (de Carvalho Araújo et al., 2019). The implementation of circular business models can also result in technological and organisational innovations and new employment opportunities (Sariatli, 2017), thus contributing to improve the society's overall wellbeing.

The above opportunities have been widely discussed in *Chapter 3*, with a particular focus on the furniture industry. Notably, as previously said, companies operating within this industry largely use different raw materials in their production activities (e.g., wood, leather, metal, and glass). Hence, the need to promote the implementation of sustainable practices is particularly

compelling for these companies in order to reduce the environmental and social impact of their activities and to improve their overall long-term survival (González-García et al., 2011).
In the following section, a general overview of the main factors which can affect or hinder the adoption of a circular economy model by companies and the role of quality certifications will be provided.

4.2.2 How to develop circularity and corporate sustainability: the role of quality certifications

According to Zhu and Qiu (2007), the implementation of a circular economy model requires the compliance of three main principles, namely 3R principles, both in production and consumption processes:

1. *reduce:* it calls for a minimization of the overall amount of input raw materials, energy used and wastes to increase efficiency in both production and consumption processes, for instance, by introducing a simplified packaging or using more power-efficient appliances (Zhijun and Nailing, 2007),
2. *reuse*: it is aimed at extending products' lifecycles through operations that allow the resources or components that are not wasted to be used again for the same purposes they were designed (European Parliament, 2008),
3. *recycle*: it refers to the possibility of reprocessing waste materials into materials and products to be used again in production processes (Birat, 2015).

The Ellen MacArthur Foundation (MacArthur, 2013) integrated the above discussed principles with four additional ones. The first principle emphasizes the importance of the design stage which has to be developed with the aim of limiting the amount of waste discharge in landfills. The second principle is based on the distinction between "nutrients" and "technical" materials and it postulates that while the former can be safely reintroduced into the biosphere, the latter need to be originally designed so as to allow their reuse. The third principle highlights the importance of using renewable energy with the aim of reducing energy dependence, thus enhancing the flexibility of the economic system. Lastly, the concept of eco-design is considered another basic principle on which circular economy lays its foundation, as it can be particularly helpful for companies in order to "internalize" those "externalities" related to the design phase

of their products. In fact, the compliance with this principle allows companies to enhance both product and process innovations by integrating environmental and sustainability dimensions within companies since the earliest stages of products development (Prendeville et al., 2014; Landeta-Manzano et al., 2017).

The adoption of quality management tools may be particularly helpful in supporting companies moving towards the implementation of circular models (Rusinko, 2005). In this regard, Integrated Management Systems (IMS), which include the adoption of Quality, Environmental and Corporate Social Responsibility Management Systems (QMS – EMS – CSRMS) and Product Certifications (PC), can be used by companies in order to implement effectively environmentally sustainable practices (Murmura and Bravi, 2018).

Several International and European recognised standards can be adopted to implement the IMS. The International Organization for Standardization (ISO) 9001 provides companies with specific guidelines to follow in order to adopt a quality system, to provide quality assurance to their counterparts and final customers, and to realise zero-defect products (Murmura and Bravi, 2017). Designed and certified according to the International ISO 14001 standard and the European Eco-Management and Audit Scheme (EMAS), the Environmental Management Systems are used within companies to integrate environmental protection policies and programs and, more generally, to reach the International and European goals of sustainable development (Testa et al., 2014; Murmura et al., 2018). Finally, companies can adopt the SA 8000 standard conceived with the aim of developing, maintaining, and implementing socially acceptable practices in the workplace (Santos et al., 2018) in order to include the Corporate Social Responsibility (CSR) agenda into their organisational settings.

Concerning Product Certifications, Environmental Product Declarations (EDP) can be used to promote the sales of environmentally friendly products. In particular, different labels based on deeply divergent requirements can be used. As pointed out by Ibáñez-Forés et al. (2016), the requirements can be based on the product's life-cycle-assessment following the guidelines provided by the ISO 14040 standard, or can be focused on other issues, such as the quality of raw materials and recyclability.

Within the wood-furniture sector, the European Ecolabel declaration provides consumers with specific information about the extrinsic and intrinsic properties of a product (Beer et al., 2011), based on the compliance of some products and process requirements. The Forest Stewardship Council certification (FSC) for sustainable wood provides companies with compliance and

standards mechanisms for implementing environmentally sustainable practices (Bowler et al., 2017). Similarly, the Carbon Footprint (CF) ecolabel can be used by companies for assessing the global warming indicator of a product, thus enhancing the environmental efficiency of their products (Bovea and Vidal, 2004). Being strictly related to the concept of eco-design, the EcoDesign or Design for the Environment (DfE) integrates different aspects of both environmental and design dimensions (González-García et al., 2011). Concluding, the "Made in Italy" label, in line with the UNI 11674:2017 standard, can be further adopted by furniture companies to guarantee the Italian origin of furniture from a sustainable standpoint.

Table 4.1 provides a synthetic description of the main process and product certifications available for companies involved in sustainable and environmental practices.

Table 4.1 – Summary of the main process and product certifications

Standards	Purposes
Process Standards	
ISO 9001:2015	International standard that provides companies with guidelines for implementing a Quality Management System.
ISO 14001:25	International standard that defines the guidelines for integrating environmental principles in their business processes with the aim of implementing an Environmental Management System.
EMAS III	European standard that defines the guidelines for integrating environmental principles in their business process with the aim of implementing an Environmental Management System.
OHSAS 18001:2007	British standard that enables an adequate management of organisational health and safety risks within companies, by developing a Health and Safety Management System.
ISO 45001:2018	International standard that enables an adequate management of organisational ethical, health and safety risks in companies, by developing an Ethical and Health and Safety Management System.
SA 8000:2014	International multi-stakeholder standard that enables companies to develop, maintain and apply socially acceptable practices in the workplace, with the aim of implementing an Ethical Management System
Product standards	
Environmental Product Declarations (EDP)	Following the lines of international ISO 14026:2006 standard, it defines Type III environmental declarations. It is verified by a third-party certification body and has a comparative purpose.
ISO 14040:2006	It describes the principles and framework for developing a life-cycle assessment (LCA) of products, evaluating their environmental impact from cradle to grave.

Forest Stewardship Council Certification (FSC)	FSC is an independent, non-governmental, not for profit organisation, established to promote the responsible management of the world's forests. This standard guarantees that the FSC-labelled products come from a forest and that the supply chain is responsibly managed. It defines Type III environmental declarations. It is verified by a third-party certification body and has a comparative purpose.
Carbon Footprint (CF)	CF is a Life Cycle Assessment based on the Global Warming Indicator which specifies the total amount of greenhouse gas emissions linked to a product throughout its supply chain.
UNI 11674:2017	Italian standard that defines the requirements for the determination of the Italian origin of furniture in a sustainability perspective. It claims that the significant phases must be carried out on Italian territory and the finished products must guarantee certain minimum safety and durability requirements.

Source: Barbaritano et al. (2019).

4.3 MULTIPLE CASE STUDY SELECTION AND PROCEDURES

As early discussed in *Chapter 3*, the multiple case study method has been here adopted with the aim to explore the extent to which Italian furniture companies are actually implementing circular economy and sustainability practices. After consulting some experts (e.g., the CEO of the furniture company where I spent my PhD, academics and scholars involved in the design management field of research), the Italian furniture companies were selected according to the following criteria:

- industry: manufacturing companies operating in the subsector of furniture and furnishing accessories,
- reference market: companies operating on a global scale,
- dimension: small and medium-sized companies with a turnover not exceeding €50 million and a number of employees less than 250[31],
- strong design orientation: companies are perceived as examples of excellence as they offer intensively design-oriented items characterised by unique features and high-quality finishing.

[31] Available at: https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=celex%3A32003H0361.

Overall, the purpose of the case study selection was to involve different companies that should provide evidence of their diversity in approaching the circular economy paradigm and its related activities. In this regard, the selected companies should be particularly fitting with the explorative purposes of the study, as they are actually involved in both design innovation and circular processes.

Four companies agreed to take part in the research, even though a greater number of companies were originally contacted. This is in agreement with Yin's guidelines (Yin, 1984), suggesting that the number of units to be analysed in a multiple case study should be between four and twelve. Notably, it is difficult to build a structured theory and to come to a "replication logic" with less than four cases (Yin, 1984).

Primary data were collected using a semi-structured questionnaire that was divided into three sections, as follows: the first part covered the background of the company (i.e., size, number of workers, types of products, etc.). The second part assessed the company's approach towards sustainability and circular economy, particularly on the implemented practices and related enabling/hindering factors. Finally, the third part investigated the use of certifications and their role within both the communication strategies and the overall sustainable approach of companies analysed. Prior to each interview, publicly available secondary material and promotional information provided by each board was reviewed in order to increase the researchers' familiarity with the case. The questionnaire was directly submitted to the companies. Each interview lasted for, on average, two hours.

The cases were analysed following the Eisenhardt and Graebner's (2007) guidelines of within-case and cross-case analysis. Each case was deeply investigated to gain a rich understanding of the main practices developed to move towards circular economy. The cases were then compared to analyse similarities and differences and to gain greater understanding of the topic under investigation.

During the study, different methods for improving the quality of the research were adopted. Firstly, some experts were involved in the selection of case studies. Secondly, interviews were conducted by the same researcher to reduce the role of bias (Strauss and Corbin, 1998) and respondents were given the opportunity to provide feedback on initial findings to reinforce the overall reliability of information. Moreover, to evaluate the validity and truthfulness of the majority of the propositions identified for the questionnaire, some answers were evaluated using the five-point Likert scale. Despite its appropriateness for quantitative studies, this

technique can be also used for measuring attitudes, perceptions, and attitudes as "qualitative attributes amenable for quantitative transformation" (Joshi et al., 2015, p. 397).

The companies analysed come mainly from North and Central Italy, where some of the most important Italian furniture districts are based (e.g., Lombardy, Marche, Piedmont and the Triveneto-Area regions). All the companies operate on a global scale, particularly in Asian regions. As for dimension, only one company is classified as a medium-large sized with a number of employees between 50 and 250 and an annual turnover of more than €10 million and less than €50 million as defined by the European Recommendation 2003/361.

Table 4.2 – Socio-demographic characteristics of the companies

	C1	*C2*	*C3*	*C4*
Position held	Marketing and Communication Manager	Marketing and Communication Manager	Sales Manager	Chief Executive Officer
Headquarter	Northern Italy	Northern Italy	Central Italy	Central Italy
Reference Markets	Italy, Europe, and Asia	Italy, Europe, USA, and Asia	Italy, Europe, USA, Asia	Italy, Europe, USA, Asia
Product Typology	Multiproduct	Multiproduct	Living	Multiproduct
Employees	90	78	25	50
Turnover	€60 million	€16.5 million	€15 million	€8 million
Turnover (Italy) (%)	30.0	25.0	80.0	35.0
Turnover (European Union) (%) *	40.0	50.0	10.0	35.0
Turnover (Extra-UE) (%)	30.0	25.0	10.0	30.0
Dimensions (2003/361/CE)	Medium-Large Company	Medium Company	Small-Medium Company	Small-Medium Company

*The turnover percentage for Europe does not include Italy.

Source: personal elaboration.

4.4 RESULTS

This section provides an in-depth depiction of the multiple case study analysis. After describing each company's profile and attitude towards circular economy principles and practices, a cross-case analysis is developed to identify potential implications.

At the end of this section, the main finding will be summarized in tables from 4.3 to 4.8.

4.4.1 Multiple-case studies analysis

Case study C1

C1 was founded in the late '70s. Since its origins, the founders have managed to successfully run the company, thus contributing to its growth worldwide until the end of the 1980s. In 1995 the sons of the founders joined the company's staff with prominent positions, thus confirming the importance given by the company to family and tradition. It was during these years that the company expanded thanks to a considerable increase in the market demand.

The company creates furniture and furnishing accessories for the whole house, in particular tables and chairs, characterized by an extreme refinement of their details and functionality. Over the years, the company's offer has expanded to include other furnishing complements such as bookcases, TV cabinets, consoles, desks, mirrors, and lamps. Moreover, several different materials have been gradually introduced to the production process, including wood, glass, leather, and metal.

The basic idea of the company is to create simple and, at the same time, beautiful objects that become synonym of perfection in the making process. As pointed out by the founder, passion and spontaneity are additional key principles that have contributed to the success of the company. Moreover, a continuous search for innovation both in terms of products and style has allowed C1 to face the increasing competition, particularly during the most recent years. Another factor that proved to be crucial for the success in foreign markets – especially the one in the Asian regions - is the excellent organisation of productive and delivery processes. Thanks to its export to over 150 countries, the company is considered a successful example of *Italian design worldwide.*

The company shows and adequate degree of awareness about the opportunities of the circular economy and related issues: it declared to be highly involved in initiatives aimed at enhancing both energy efficiency and the use of renewable energies in its production processes. As for the reuse activities, a moderate implementation of reuse of cleaning equipment materials has been registered, while other practices related to the reuse of product packaging and leftover materials to manufacture new products are scarcely adopted. Finally, C1 declared to recycle very little waste produced in the manufacturing process (Table 4.3).

However, it is important to point out that C1 expressed its willingness to enhance its overall sustainable performance through a future implementation of activities related to the reduction

of raw materials and the recycle of waste produced during the manufacturing process (Table 4.3).

Motivations related to the reduction of the environmental impact of manufacturing processes have emerged as the main reason for adopting such practices. Economic motivations, for example the possibility to increase the company's competitive advantage and the increasing efficiency related to the reduction of total costs have also been expressed. Furthermore, C1 declared to be interested in improving people and workers' health conditions (Table 4.4).

Fiscal and economic incentives for investments in R&D activities have been recognised as crucial factors for the implementation of circular economy practices, in addition to an efficient differentiated waste collection system. An adequate degree of consumers' awareness about environmental issues has also been considered as a relevant factor. However, the company expressed some difficulties in adopting such practices mainly related to the type of materials used in manufacturing processes and final products (Table 4.5).

As for the quality certifications, C1 declared to adopt only the FSC voluntary product certification for sustainable wood. Surprisingly, the company declared to not adopt the "Made in Italy" labelling, despite its worldwide recognition as an Italian company delivering high quality products (Table 4.6). Additionally, C1 was asked whether it could be interested in adopting both product and process certifications in the next future. In this regard, the possibility to assure compliance with environmental legal standards as well as the possibility to improve the corporate image and workers' safety at the workplace emerged as potential stimuli (Table 4.7).

Finally, C1 provided some information about the communication activities used for sharing its commitment towards sustainability: the company's website along with its catalogues and the Sustainability Budget have been recognised as the most helpful communication tools (Table 4.8).

Case study C2

Established in 1954, C2 is recognised as one of the major protagonists in the Italian history of design between the 50s and 60s. From its very beginnings, the company has conquered the international design scene thanks to its emblematic products that stand out for their formal innovation and the quality of the materials used in production processes.

The company's offer includes furniture and furnishings objects, both for the living and sleeping areas: tables, chairs, beds, and many others. Contemporary design, aesthetic, functional and

eco-compatible quality, along with a continuous technological experimentation are the main values underpinning the company's success. Several different technologies are embedded in the production processes, based on the use of different materials, ranging from metals, stones, and fabrics to wood. Overall, beauty, usability, and durability are the main successful features of the company's offer.

From an international standpoint, the success of C2 in the field of design has been confirmed by three Compasso d'oro Awards[32]. Over the years, the company has also taken part in numerous exhibitions and events in the field of art, architecture, and fashion, thus becoming a leading representative in the culture of design. Moreover, numerous company's products are exhibited in different museums worldwide, including the Museum of Modern Art (MoMA) and the Metropolitan Museum in New York, the Pompidou Centre in Paris, and the Design Museum in London.

As for its economic success, nowadays the company operates in over 60 countries with four Flagship Stores and an export share of about 75% of turnover.

The company has shown little awareness of the opportunities related to circular economy, in terms of both current and future implementation of such practices. In fact, C2 declared to mainly adopt initiatives for enhancing energy efficiency and the use of renewable energies. Concerning the reuse activities, though, a moderate implementation of reuse of product packaging and leftover materials has been registered. Moreover, C2 declared to be modestly involved in activities aimed at recycling products from consumers in order to manufacture new ones (Table 4.3).

Motivations related to an improvement of the performance in terms of sustainability have received little consideration by the company. A similar attitude has been observed with regard to economic reasons, for example to the possibility of a cost reduction due to greater efficiency in production processes (Table 4.4).

As for the enabling factors, fiscal and economic incentives for investments in R&D activities have been recognised by the company as the main factors facilitating the adoption of a circular approach. Besides that, C2 has pointed out different hindering factors, including the possibility to benefit from an inexpensive waste collection system and difficulties related to the type of materials used in manufacturing processes (Table 4.5).

[32] This award has been instituted in 1954 and it is the oldest and most prestigious global design award conceived with the aim of promoting the value and quality of Italian design products.

Despite the little awareness concerning circular economy practices, C2 declared to adopt the OHSAS 18001 standard – a type of process certification – and to be interested in adopting product certifications in the near future (Table 4.6). In this regard, the possibilities to improve the corporate image and to develop a socially sustainable strategy have been identified by C2 as the possible motivations towards the adoption of product certifications (Table 4.7).
In conclusion, the company declared to be generally not involved in activities aimed at communicating the adoption of circular economy and sustainability practices (Table 4.8).

Case study C3

The company started as a mirror manufacturer in the early '90s, but it was only from the last decade that it started experiencing a rapid and constant economic growth, moving from the production of mirrors to a wide range of other furniture and furnishing objects.
Nowadays, the company's offer includes tables, consoles, cabinets, chairs, and lamps, characterised by elegance and great functionality. All products, well designed in every detail and with a wide range of possibilities for customization, reflect the company's ability to combine aesthetics, functionality, craftsmanship, and environmental sustainability. The development of new products is entirely carried out within the company and the collaboration of local suppliers is preferred. Moreover, all production processes take place in Italian factories and are based on the use of top-quality raw materials, such as hollow core wood, glass, aluminium. and water-based paints.
These factors highlight a particular sensitivity of the company towards environmental sustainability issues and the valorisation of the territory. Moreover, in this regard, C3 contributed to the promotion of some of the most beautiful Italian tourist attractions by organizing numerous charity events.
Nowadays, the company is considered as an important reality in the furniture and design industry, with a turnover of about 15 million euros in 2017 and an average annual increase in turnover of about 25% over the last 3 years.
The company shows a moderate degree of awareness regarding circular economy and environmental issues. Concerning reduce activities, C3 is actively committed in practices aimed at reducing the amount of raw materials and the energy used in the production processes. Despite this, reuse activities are scarcely adopted by the company, except for the re-use of product packaging materials. In fact, the main circular economy practices adopted by the

company are the activities related to the recycle of the waste produced during the manufacturing process. These are performed according to the recycle principle (Table 4.3).

Despite its current moderate involvement in the adoption of circular economy practices, the company declared to be highly interested in the future implementation of activities related to the use of renewable energies and to the re-use of cleaning equipment of and leftover materials to manufacture new products (Table 4.3).

Environmental motivations have been considered by C3 as the main factors underlying the adoption of such practices. Besides, the possibility to strengthen the competitive advantage and to create new professional figures to employ within the company have been pointed out as additional economic rationales (Table 4.4).

An adequate degree of awareness from consumers about environmental issues and the possible use of artificial intelligence systems in production/distribution processes have been recognised by C3 as potential enabling factors for implementing circular practices, while the high costs of the waste disposal processes have been considered as the main hindering factors (Table 4.5).

Concerning the adoption of both product and process certifications, the company admitted that it has not adopted any international standard currently. However, it expressed its interest towards a future implementation for several reasons (Table 4.6). Notably, the compliance with environmental legal standards, the possibility of entering new markets and of increasing customers' loyalty have been pointed out as the main motivations (Table 4.7).

The collaborations with Universities and Research Centres have proved the company's willingness to adopt circular models. Lastly, the adoption of product label information, the participation to events on sustainability and related issues along with the use of the company's website and catalogues are actually used by the company as the main tools for communicating its attention towards environmental and sustainable issues (Table 4.8).

Case study C4

The company has been producing and selling manufacturing furniture and furnishing items using curved glass since its origins in the 1970s. The high technology embedded in the manufacturing processes and the numerous collaborations with some of the most famous world-renowned designers have allowed the company to become a global leader in the design field.

The company's offer includes mirrors, tables, chairs, consoles, and many other accessories, such as lamps, valets, and magazine racks. Each product, mainly realised with curved glass, represents a perfect combination of design, art, and quality. Given the particularity of the main raw material used in the production processes, i.e. glass, the company has decided to adopt, as will be seen later, a quality system aimed at guaranteeing the creation of zero-defect products and the improvement of its environmental performance.

Design, human skills, quality, and the continuous search for innovation are the main drivers of the company's competitiveness. Notably, the innovation of the manufacturing processes allowed the company to realise several products whose success has been confirmed by prestigious awards gained over the years, i.e. the Compasso d'Oro Award (2001) and the Leonardo Quality Award (2015). Moreover, some of these products have been exhibited in 25 international museums worldwide, among which the Museum of Modern Art (MoMA) in New York.

In terms of economic performance, the company is concentrating its business activities primarily in European markets, with an annual turnover share of around 75%. The economic growth recorded in Asian countries is also encouraging, with an annual turnover share of around 30%.

The company showed a high degree of awareness about the opportunities and activities related to the concept of circular economy. In particular, it declared to be in the process of implementing reduce activities for improving the environmental impact of its manufacturing processes. Reuse activities of product packaging materials and leftover material to manufacture other products are moderately implemented by the company. As for the recycle activities, C4 declared to be highly committed in the reprocessing practices of waste and garbage to manufacture new products (Table 4.3).

The company showed a high interest towards the future implementation of reuse activities, particularly with regard to the use of renewable energies, thus proving its willingness to enhance its overall environmental performance through the adoption of other circular practices (Table 4.3).

Motivations related to the reduction of the environmental impact of the manufacturing processes are particularly relevant for the adoption of circular practices for the company. Meanwhile, C4 also stressed the possibility of increasing its competitive advantage and of

increasing the total amount of sales, especially referring to the consumers more sensitive to sustainability and related issues (Table 4.4).

Moreover, fiscal and economic incentives for investments in R&D as well as an adequate degree of consumers' awareness about environmental issues have been considered by C4 as crucial factors supporting the implementation of circular practices (Table 4.5).

However, some difficulties mainly related to the type of materials used in the manufacturing processes and to final products have been also underlined by C4 as possible hindering factors towards the implementation of sustainable practices (Table 4.5).

Currently, the company is implementing the UNI EN ISO 9001 process certification. Moreover, it has expressed a remarkable interest in the future adoption of product certifications (Table 4.6). In particular, the possibility of improving the efficiency of production processes through a more effective monitoring of related emissions has been pointed out as the main motivation that is driving C4 towards the adoption of such certifications (Table 4.7).

The company declared to highly rely on the use of the website, catalogues and products brochures to communicate its commitment towards environmental and sustainability issues. Lastly, C4 is actually involved in collaborations with Universities and Research Centres with the aim to develop circular and sustainable projects (Table 4.8).

*Table 4.3 - Current and future implementation of circular Economy practices**

		Current implementation				*Future implementation*			
		C1	C2	C3	C4	C1	C2	C3	C4
Reduce	Reduction of raw materials per product unit	3	1	5	3	4	2	3	5
	Overall reduction of raw materials and energy	3	1	3	5	4	2	4	5
	Use of renewable energies	4	1	1	3	3	2	4	5
	Initiatives for enhancing energy efficiency of production equipment	4	2	1	3	4	2	1	3
Reuse	Re-use of product packaging materials	2	2	3	2	3	2	3	1
	Re-use of cleaning equipment materials	3	1	1	2	2	2	3	1
	Re-use of leftover material to manufacture other products	2	2	1	2	2	2	3	5
Recycle	Recycle of waste produced in the manufacturing process	2	2	3	4	4	2	3	3
	Recycle of waste products from consumers (e.g., out of date and returned products, etc.)	1	1	5	1	2	2	3	1
	Reprocessing of waste and garbage	2	1	1	1	2	2	1	1
	Reprocessing of waste and garbage to manufacture new products	1	1	1	5	2	1	1	5

*The list of circular economy practices was based on Zeng et al., 2007. Answers were evaluated on a 5-point Likert scale (1=not at all important, 2=very little important, 3=moderately important, 4=high important; 5=very high important).

Source: personal elaboration.

*Table 4.4 – Motivations towards circular economy practices**

	C1	C2	C3	C4
Reduction of the environmental impact of the manufacturing processes	4	1	4	5
Reduction of risks related to the dependence on raw materials	3	1	5	3
Gaining a competitive advantage in relation to competitors	4	1	5	5
Greater possibilities to obtain public funding	3	1	1	4
Reduction of the total amount of costs, thus enhancing efficiency	4	1	3	4
Improving people's and workers' health conditions	4	1	2	3
Increasing the total amount of sales, especially among those consumers concerned about sustainability and related issues	3	1	5	5
Creation of new professional and reduction of the unemployment rate	3	1	5	3

*Answers were evaluated on a 5-point Likert scale (1=not at all important, 2=very little important, 3=moderately important, 4=high important; 5=very high important).

Source: personal elaboration.

*Table 4.5 – Enabling factors for implementing circular economy practices**

	C1	C2	C3	C4
Fiscal and economic incentives for investments in R&D	5	3	1	5
Efficient differentiated waste collection system	5	3	5	3
Possible use of artificial intelligence systems in production/distribution processes	5	1	5	3
Adequate degree of awareness about environmental issues among consumers	5	2	5	5

*Answers were evaluated on a 5-point Likert scale (1=not at all important, 2=very little important, 3=moderately important, 4=high important; 5=very high important).

Source: personal elaboration.

Table 4.6 – Implementation of product and process certifications

	C1	C2	C3	C4
Product certification	Yes	No, but we are interested in pursuing it in the near future	No, but we are interested in pursuing it in the near future	No, but we are interested in pursuing it in the near future
Type of Product certification	FSC	-	-	-
Process certification	No, but we are interested in pursuing it in the near future	Yes	No, but we are interested in pursuing it in the near future	Yes
Type of Process certification	-	UNI EN ISO 9001 – OHSAS 18001	-	UNI EN ISO 9001

Source: personal elaboration.

*Table 4.7 – Motivations towards product/process certification adoption**

	C1	C2	C3	C4
Total costs reduction	3	1	5	3
Achievement of higher-quality standards in products compared to competitors	4	1	5	3
More effective monitoring of manufacturing processes resulting in an improvement of the overall efficiency	5	2	5	5
Increase in customers' loyalty	4	2	5	3
Possibility of entering new markets	5	2	5	3
Improvement in corporate image	5	3	5	2
Improvement in the workplace safety	5	3	5	3
Compliance with environmental legal standards	5	3	5	3
Developing a socially sustainable strategy	5	3	5	3
Possibility of using funding from national/supranational public authorities	5	2	1	3

*Answers were evaluated on a 5-point Likert scale (1=not at all important, 2=very little important, 3=moderately important, 4=high important; 5=very high important).

Source: personal elaboration.

*Table 4.8 – Tools for communicating circular economy and sustainability practices**

	C1	C2	C3	C4
Drafting a Sustainability Budget	5	1	1	2
Product label information	5	1	5	2
Product packaging information	5	1	5	2
Participation at sectoral fairs	4	1	5	2
Participation at workshops and events with reference to sustainability and related issues	2	1	5	4
Website use (also for publishing information related to product and process certifications, environmental and energetic management systems)	4	1	5	5
Use of company's website	4	1	5	5
Participation in forums, blogs, communities, online group discussions related to sustainability issues	2	1	5	5
Collaborations with Universities and Research Centres in order to realize/develop projects related to circular economy and sustainability issues	4	1	5	5
Use of companies' catalogues/product brochures and instruction manuals	5	1	5	5
Publication on periodicals and dedicated magazines	2	1	4	1
Mass-media advertising (TV, radio, press)	1	1	2	1
Periodic reports and bulletins that analyse/certify environmental ratings, compliance with certifications, etc.	2	1	5	1

*Answers were evaluated on a 5-point Likert scale (1=not at all important, 2=very little important, 3=moderately important, 4=high important; 5=very high important).

Source: personal elaboration.

4.4.2 Cross-case analysis and managerial implications

The empirical findings in the present study revealed a worthy degree of awareness and understanding of circular economy and sustainable issues in the furniture sector. Notably, two companies have declared to have a good knowledge of the concept of circular economy and have expressed their willingness to deepen its principles, while one company has declared to have been developing an adequate internal training aimed at promoting the implementation of a circular model. These results are consistent with prior studies (Brennan et al., 2015;

Ghisellini et al., 2016; Murray et al., 2017) which highlighted an increasing attention by companies towards circular economy. However, despite this attention, the companies analysed showed little involvement in circular practices, particularly with regard to reuse and recycle activities. In fact, similarly to Yuan and colleagues' findings (Yuan et al., 2006), this study revealed that companies show a greater attention towards reduce activities involving the use of energy and raw materials, which are strictly related to the overall efficiency of the companies' manufacturing processes and their overall economic benefits. Motivations that push luxury companies to adopt circular economy practices, in fact, would be mainly economic and environmental ones. This reveals a partial understanding of the potential advantages linked to circular economy. The managers interviewed, indeed, seemed to be mainly focused on the perceived economic and environmental advantages which can result from the adoption of circular practices, e.g., process efficiency and cost reduction, thus underestimating their potential social impact in terms of reduction of the unemployment rate and of improvement in the social wellbeing, just to give a few examples.

Similarly, even if a moderate degree of awareness about the opportunities related to its implementation emerged, the adoption of product and process certifications is still little employed by the companies. More in detail, the managers interviewed proved to widely acknowledge both the economic and social benefits that can result from its implementation. Furthermore, they recognised its potential as marketing tool useful to help companies entering new markets and increasing customer loyalty and brand awareness. These results suggest, therefore, a worthy degree of appreciation by furniture companies of both the efficacy and the efficiency advantages emerging. However, as we will see later, some initiatives aimed at assisting managers in the implementation phase of such standards could be enforced.

Different managerial implications can be drawn from this study. Given that circularity requires to be regenerative or restorative (MacArthur, 2013), companies should develop sustainable practices that allow reducing, reusing, and recycling components and materials since the design phase. Referring to the specific context of the furniture sector, it is important to highlight the crucial role played by designers, because their creativity affects the use of materials as well as the characteristics of the final products. Therefore, it would be desirable for these products to be based on the use of sustainable materials, as to facilitate the reuse of the final products also in the end-of-life. Furthermore, internal training along with informal and planned meetings could be very helpful to enhance the diffusion of a new business model within companies, as it

requires an overall cultural change and a general involvement of the whole personnel, including designers. Periodic reports and indicators could also be useful to summarise the benefits related to circular economy and to operationalize the results.

Additionally, the adoption of a circular standard promotes the introduction of a new consumption model where property is replaced by access (de Carvalho Araújo et al., 2019). This model should guide the transformation of consumers-owners into consumer-users, through the possibility of return, recycle, or reuse of the products after their use. In this regard, it would be important to improve an adequate training for the final market, which could be promoted by both schools and local institutions (e.g., events, workshops, seminars to raise individuals' awareness on circular economy issues). Companies should also promote this new model of consumption, for example, by offering economic incentives stimulating consumers to give back the product at its end-of-life. Certainly, this requires a widespread distribution network and high economic and managerial resources, that in smaller companies are sometimes lacking (Rizos et al., 2015). However, it could be recommended for reinforcing reusing practices.

Another basic principle on which circular economy lays its foundation is the reverse cycle. To create value from used materials and products it is necessary to collect them and take them back to their origins (de Carvalho Araújo et al., 2019). In this regard, companies should put more efforts towards the implementation of an efficient reverse logistic and a system of waste and product leftovers treatments, so as to be able to allow the reintroduction of such materials in the market. These opportunities can be particularly interesting for furniture companies, as well as for others operating in similar contexts, since they can improve their abilities to address specific market needs, especially among more sustainable consumers. Given that the economic limitations and the lack of financial resources emerged as some of the potential hindering factors to the implementation of circular economy, a crucial role can be played by Governments and public institutions. In fact, the latter can provide suitable economic and fiscal incentives to promote investments in technology and R&D, in addition to a merely administrative approach.

Finally, with regard to the adoption of product and process certifications, the managers interviewed did not provide detailed reasons behind the little adoption of such tool, thus suggesting the need for future research. Prior studies (Abdullah et al., 2012; Murmura and Bravi, 2017) widely recognised that the adoption of product and process certifications can be hindered by some factors, among which are the high implementation and maintenance costs along with their bureaucracy and the organizational complexity required. Additionally, their

implementation requires professional figures and time dedicated exclusively to their management, thus representing another additional hindering factor (Santos et al., 2016). In this regard, a change in companies' cultures and in top management becomes, thus, necessary. Companies should consider these tools as medium-long term investments that can lead to improvements not only in the organization and the environment, but also in the brand image and in the company's competitive advantage (Civcisa and Grislis, 2014). As pointed out by González-García et al. (2011), the implementation of Design for Environment (DfE) in the development of furniture products can be particularly helpful for companies in order to bring innovation into their production process which, in turn, can allow to reduce their environmental impact as well as to improve overall companies' efficiency. Furthermore, the adoption of product and process certifications – through truthful claims and messages - could be used by companies with the aim to communicate their commitment to environmental issues. As emerged from the present study, two companies clearly recognised the role of products and process' label as communication tools for sharing environmental values.

Another interesting suggestion could be derived from Schuler and Buehlmann's study (2003), which highlighted the relevance of a favourable system condition. In particular, the empirical analysis proved the importance of those centres of excellence or industry clusters in facilitating the development of a value-added product culture in the furniture industry. In this process, the strategic partnership between customers, manufacturers and suppliers, institutions and other stakeholders proved to be crucial. The collaborations between different value chains and sectors could very useful for developing also a large-scale circular system (MacArthur, 2013; de Carvalho Araújo et al., 2019). Relationships with other companies, indeed, can provide some advantages. For example, they can help companies in the information sharing and product development, as well as for the adoption of sectoral standards. Finally, by considering a network perspective, the waste produced by a company could be used as raw materials by other companies operating within the same cluster, thus enhancing both cooperation and resource exploitation reduction.

4.5 CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The present study adds further knowledge to the existing literature on circular economy, with specific regard to the furniture sector. Notably, results show that circular economy applied to this sector is still a new concept towards which companies are increasingly addressing their

attention. A potential gap between this positive attitude and the practical implementation of circular practises emerged, since companies display a primary focus on reducing activities while neglecting or undervaluing recycle and reuse practices.

Similar findings emerged with regard to the adoption of product and process certifications. The companies analysed proved to be aware of the potential advantages linked to the adoption of such tools, both from the economic and communicative standpoints, but they reported a very limited use of them.

All this points out the possibility of a wide space for future research aimed at understanding what companies can do to reduce the above gaps and exploit the opportunities of a circular business model. Notably, an in-depth analysis of both organisational and structural conditions required for the implementation of circular practices could be particularly helpful. In this regard, a further comparison with other similar and related industries could be recommended for understanding similarities and differences among various market contexts.

Additional suggestions can be derived from the limitations of this study, in particular concerning the multiple case study method. Since these findings are not characterised by generalisability (Hodkinson and Hodkinson, 2001), a greater number of case studies, along with the development of a quantitative survey, could be worthy of attention for future research.

Finally, since little knowledge about it emerged in the present study, further research on the end-of-life phase of the products with regard to the circular economy application is required.

CHAPTER 5

SECOND QUALITATIVE STUDY:

Design and sustainability for innovation. Evidence of eco-design practices from a family firm

5.1 INTRODUCTION

Developing circular and sustainable practices should not lead companies to reduce their innovation efforts, since they still remain critical for both their competitiveness and survival (Duran et al., 2016). Furthermore, an increasing number of innovation opportunities have emerged over the years as a result of the growing globalisation, technology changes, and new consumption patterns (Pisano, 2015). In this regard, design has been recognized for a long time as a crucial factor in product innovation (Cooper and Kleinschmidt, 1987; Johne and Snelson, 1988) and companies' competitiveness (Cross, 2011), particularly in Italian companies. As pointed out by Galloni and Mangiarotti (2005), design is based on an original combination of aesthetic taste and craftsmanship, which allows the realization of small series, strongly characterized by uniqueness and rarity, and are often addressed to sophisticated niche markets.

Nevertheless, as widely discussed in *Chapter 2*, changes occurring in the economic scenario, over the recent decades, require new competitive logics. Even though design is still considered a critical element in product differentiation (De Fusco, 1985), a partial redefinition of this concept is needed to identify plausible pathways to relaunch companies' competitiveness, especially in light of the increasing importance of environmental and sustainable issues. Hence, the questions of whether and how furniture companies can produce design innovation through the adoption of circular economy principles and how they can exploit such practices for the development of innovative products emerge.

The above research questions drive the second step of this study, which is still explorative in nature, given the lack of empirical evidence investigating the relationship between innovation, circularity, and eco-design, especially in small-and medium-sized (SMEs) furniture enterprises, representing the large percentage of Italian business. The massive economic and financial

resources required to implement circularity practices would suggest that SMEs could be disadvantaged in the adoption of circular practices compared to larger companies (Rizos et al., 2015). However, to date, there are no empirical evidence that confirm the above assumptions. Hence, this study aims to provide further knowledge about this relationship by analysing how SMEs can produce design innovation through the adoption of circular economy principles and how they can exploit the different circular practices to develop innovative products.

The rest of this Chapter will illustrate the results of the analysis of a single case-study carried out within a small-sized Italian furniture company, more specifically a glass furniture business. The analysis has been supported by a literature background on the concept of innovation and eco-design, specifically related to SME context. The findings suggest that the pursuit of sustainable environmental policies can be considered as an innovative and powerful force in generating new processes and products.

Several contents of this chapter are drawn from a paper recently published by the Italian journal *Piccola Impresa/Small Business*, co-authored by Elisabetta Savelli and me[33].

5.2 LITERATURE BACKGROUND

5.2.1 Innovation within family SMEs

SMEs represent the largest group in the economic system. At European level, the majority of the business population (about 98%) is made up by SMEs, thus playing a fundamental role for economic growth and stability (European Commission, 2018). Over the last decades, the topic of innovation within SMEs has gained considerable attention (Calabrò et al., 2019), due to several reasons (Amara et al., 2008; Oke et al., 2007). Notably, prior research revealed the idiosyncrasy of SMEs' innovative behaviour (Petter et al., 2014; Battistella et al., 2015), given their dependency on the surrounding environment (Antonioli et al., 2014) and their peculiar features, such as the lack of human, financial, and economic resources, which truly affect their ability and attitude towards innovation (Bigliardi, 2013; Majama and Magang, 2017).

The theoretical debate surrounding the topic of innovation within SMEs appears particularly interesting and controversial in a family firm context, with one or more members occupying managerial positions (Fernández and Nieto, 2005). These firms, in fact, present some

[33] Barbaritano, M., & Savelli, E. (2020). Design and sustainability for innovation in family firms. A case study from the italian furniture sector. *Piccola Impresa/Small Business*, (1).

peculiarities linked to the family's participation and involvement in innovation activities, as well as in the overall company's management.

In this regard, different theoretical perspectives have been applied. Based on the behavioural agency theory, some scholars (Roessl et al., 2010; Wright, 2017) pointed out that family SMEs are usually less likely to invest in innovation activities, while some others (König et al., 2013; Kumar et al., 2019) highlighted their ability to adopt both discontinuous technologies and innovations. The social-capital theory and the social system theory have been used to explain both advantages (Andrade et al., 2011) and disadvantages (De Clercq and Belausteguigoitia, 2015) related to the implementation of innovative practices in family firms. Notwithstanding the interesting results that emerged from the conceptual studies, a complete and shared framework of the factors characterizing the innovation processes of family SMEs, both in a positive and negative way, has not been identified yet.

Empirical findings were also contradictory. While on one hand, some studies demonstrated the existence of a positive relationship between innovation and family firms (Kim et al., 2008; Dunne et al., 2016), on the other side some others found negative ones (Munari et al., 2010; Staniewski et al., 2016).

Another stream of contemporary research concerns the role of the owner's involvement in government and management activities, which can result in unique resources that may influence family firms' innovation processes. In the early 2000s, Gudmundson et al. (2003) highlighted the existence of a positive relationship between the owner's involvement and the companies' ability to introduce innovative products in the market. Conversely, Chin et al. (2009) demonstrated that both the number and the quality of the received patents are negatively affected by the owner's involvement. On a more general level, Pierre and Fernandez (2018) pointed out that the owner's propensity towards innovation directly influences companies' efforts in the development of innovative activities.

To sum up, notwithstanding its relevance (Hoy and Sharma, 2010; De Massis et al., 2013), the debate on innovation within family SMEs is rather controversial. Hence, the topic deserves further investigations, for both theoretical and practical advancements.

5.2.2 Eco-design for innovation in SMEs

In recent decades, the growing awareness about environmental issues and the related consequences are changing the way people do business worldwide (Dai et al., 2015). Indeed,

consumers, governments, investors, and other actors involved in the value chain are more likely to interact with environmentally responsible organizations (Jansson, 2011).

As introduced earlier in this chapter, the ways SMEs relate to environmental issues still constitute an open debate in literature (Sáez-Martínez et al., 2016; Demirel and Danisman, 2019). Due to their flexibility in terms of organisational features (e.g., fewer hierarchical levels, informal communication style, etc.), SMEs are regarded as more likely to engage in environmental practices (Sáez-Martínez et al., 2016; Cantele and Zardini, 2020). However, Klewitz and Hansen (2014) pointed out that some SMEs' characteristics, such as the lack of resources and the tendency to a short-term orientation, can prevent them from engaging in such practices.

However, since the aesthetic and functional attributes of products cannot be regarded as the only tools for differentiation and competitiveness (Hertenstein et al. 2013), environmental and social sustainability issues cannot be underestimated by SMEs. Hence, the growing relevance of the concept of eco-design for companies' growth and long-term survival (Plouffe et al., 2011; Demirel and Danisman, 2019).

Over the years, several definitions of the concept of eco-design have been provided by scholars. In the early 2000's, van Hemel and Cramer (2002) defined it as the systematic effort of a company to improve the environmental profile of product(s) in all stages of the product life cycle. Bovea and Pérez-Belis (2012) described it as an activity aimed at integrating environmental issues into the product development process. In a similar vein, Olkowicz and Grzegorzewska (2014, p. 206) referred to eco-design as Design for Environment (DfE), "an umbrella term describing techniques used to incorporate an environmental component into products and services before they enter the production phase". The common core of the above-mentioned definitions has been captured by Marques et al. (2017), who defined eco-design as a process including all the activities along the value chain developed with sustainability principles in mind - such as the creation, distribution, consumption, disposal, and re-entry of a product into the market.

Concerning the specific context of the glass furniture sector, eco-design can influence every phase of the companies' value chain. Starting from the supply of the raw material, eco-design can encourage the use of recycled glass. Moreover, in design and in the conceptualisation phases of new products, eco-design can promote a limited use of raw materials, for example through the creation of furnishing objects whose components can be easily recycled. In this

regard, the use of recyclable raw materials – including aluminium and glass – could be recommended. During the production process, eco-design can promote the use of water paints rather than chemical ones, with the aim of improving workplaces' healthiness and of reducing gas emissions.

In the assembly and product finishing stages, eco-design can suggest the adoption of glues containing no-toxic elements and the re-use of production wastes. Being the glass manufacturing processes characterized by a high energy consumption mainly related to the fusion process that absorbs between 50% and 80% of the required energy, eco-design can encourage the use of machinery with low energy emissions (Vinci et al., 2019). Lastly, as for the distribution activity, eco-design could encourage the optimization of products' storage, with the aim of enabling a better use of spaces and of reducing the number of trips, with related advantages in terms of gas emissions and fuel consumption.

Notwithstanding the increasing awareness of the strategic relevance of eco-design (Krotova et al., 2016; dos Santos et al., 2019), the debate on the adoption of such approach in the context of SMEs and family firms is still controversial (Joachimiak-Lechman et al., 2017). Recent studies (Witczak et al., 2014; Joachimiak-Lechman et al., 2017) highlighted that the adoption of an eco-design approach and the implementation of environmental innovation can be successfully developed by family SMEs, even though resources are limited and the executive authority is concentrated in the owner. On the contrary, Deutz and colleagues (2013) pointed out that large companies seem to be more likely to adopt the environmental principles during all stages of the design process than SMEs. Certainly, the implementation of an eco-design strategy entails several requirements, which can sometimes discourage SMEs (Olkowicz and Grzegorzewska, 2014; Rossi et al.,2016; Prendeville et al., 2017), including:

- time-consuming efforts to develop these activities and the financial and human resources to enable and to perform them,
- specific knowledge related to the different environmental issues in order to best address them,
- obtainment of environmental certifications from the eco-labels institutions.

However, the adoption of environmental and social dimensions into innovative practices has been recognized as critical for small and family firms, as it can facilitate their ability to gain and nurture a competitive advantage in the current economic scenario (Srivastava et al., 2001).
Hence, in order to enhance the companies' ability to discover new environmentally-friendly opportunities and technological solutions (Ghisetti and Montresor, 2018) and their overall transition towards more sustainable production systems (Mulder, 2007), the need for an in-depth investigation aimed at analysing the critical role of eco-design in the small and family business context emerges.

5.3 CASE STUDY SELECTION AND PROCEDURES

As previously discussed in *Chapter 3,* the single case study methodology has been here adopted to analyse the process of development of new environmentally-friendly products within the context of family SMEs. The rationale behind this choice lies in the suitability of this method for studying new topics, as well as for developing emerging theories (Yin, 1981; Bonoma, 1985). Indeed, the investigation of the concepts of innovation and eco-design requires a careful and thorough analysis in order to better understand how and why they are managed along different stages of the value chain within a small business setting. The selection of the case study has been based on Miles and Huberman's guidelines (1994) and, in order to provide a rich and detailed description of the phenomenon under investigation, the study has been conducted by analysing a real family-owned business.
The case study analysed is Fiam Italia Srl (Fiam), a glass furniture company operating in the Marche region. Fiam has been selected for several reasons. Firstly, the company is classified as a small-sized firm, more specifically a family business, entirely owned and managed by the founder and other family members. Secondly, Fiam operates in the furniture sector, more specifically in the subsector of glass furniture and furnishing accessories (such as mirrors, tables, coffee tables, chairs, shelves, and other accessories). Thirdly, Fiam is a design-intensive company, as it heavily relies on the creativity of its designers for the development of new products (Dell'Era and Verganti, 2010). Fourthly, the company is worldwide recognised for its innovativeness. Since its beginnings in 1973, Fiam's main driver of competitiveness has been innovation, as demonstrated by several successful products, e.g. "Ghost", the first chair realised with a single sheet of glass and recognised worldwide as a design icon, and prestigious Awards for innovation, e.g. the Leonardo Quality Award (2015) and the Compasso d'Oro Awards (2001).

Lastly, Fiam is actually involved in environmental practices. From its origins, the company has always been working with glass, which is one of the raw materials with the lowest environmental impact in the furniture sector, as it is entirely and infinitely recyclable. Furthermore, the company stands out for the adoption of process certifications and for the continuous research of new products and processes aimed at improving its environmental approach. Particularly, in recent years, Fiam has intensified its efforts towards the adoption of a circular business model by including eco-design principles into its processes since the early stages of product development.

Therefore, the Fiam case study perfectly fits the exploratory purposes of this phase, as it offers the "rare and extreme" qualities needed in order to observe the phenomenon under investigation (Eisenhardt and Graebner, 2007).

During 2018, multiple interviews were conducted to collect information about the company's approach towards environmental issues and to achieve a deeper understanding of how the new product development process is managed within the company. Moreover, an interesting example of eco-design innovation has been analysed, by focusing on the role of the owner in the new product development process and on the factors affecting its development and success. Primary data were collected using a semi-structured and open-ended questionnaire that covered the following topics: (i) company's profile; (ii) information about innovation activities (iii) information about companies' approach towards environmental issues; (iv) information about the development and the success of a specific eco-design innovation. To further improve the quality of the information gathered during the interviews, other people within the company considered as "willing to share their knowledge" have been involved (Patton, 2014, p. 284). The respondents were also encouraged to give additional feedbacks.

Additional information from other sources, such as the company's website, its profiles on different social networks, and other documents provided by the managers interviewed have been analysed to reduce the likelihood of misinterpretation and to consider multiple viewpoints (Ghauri, 2004).

Each interview lasted for approximately two hours. All the interviews were conducted, recorded, and transcribed in Italian, and then translated into English.

5.4 FIAM CASE STUDY

5.4.1 Company profile

Since 1973, Fiam produces and sells manufacturing items in curved glass. From the beginning, the company has been fully owned and managed by the entrepreneur's family, more specifically by the founder and, in recent years, by his two sons. Vittorio Livi is the founder of the company, while Daniele and Francesco Livi, respectively, play the role of CEO and Export Area Manager.

The company's offer consists of tables, chairs, consoles, libraries, shelves, and other glass accessories, such as coat-hangers, lamps, magazine racks, mirrors, and valets. All the products are realised in curved glass with the aim of transforming both home and office environments into stimulating spaces to be lived and admired. Each product is a perfect mix of art, quality, and design. In particular, the glass used in manufacturing processes – namely "float"- is produced by the multinational AGC, whose qualitative standards enable Fiam to realise products that are perfectly flat and that preserve over time the purity of transparency and an almost total absence of defects in the vitreous mass.

Currently, Fiam takes on about 50 employees, with an annual turnover of approximately €9 million. About 30% of annual turnover comes from the Italian market, about 35% from EU Countries, and about 35% from extra-EU markets. Despite the fact that the company operates mostly on the European market, it is experiencing an interesting growth in international countries, particularly in Asia.

Concerning the distribution system, the company relies on different agents, who refer to the various sales managers, according to specific geographical market criteria. Every year, the sales managers define the reference budgets for each agent in line with the results of the previous year and the future development prospects of each area. The agents deal with intermediate customers, i.e. the retailers, and help them throughout the overall processes of purchasing and managing the relationship with the company. Finally, the retailers sell to the final consumers and provide them with additional services, including pre- and after-sales assistance.

5.4.2 Fiam's approach towards innovation

Being the first company that produces furnishing items in curved glass, Fiam has always been recognised for its innovativeness. Design and technology are the main innovation drivers within the company.

Starting from the first table “Onda pouf”, which was entirely designed by the founder, Fiam has been constantly developing new products. In 1984, the innovative and successful project of the first single-block table, i.e. "Ragno", was developed, while in 1987 the first armchair in curved glass, i.e. "Ghost" - which is still considered a design icon - was created. In 1997, for the first time, the curved glass was combined with a mirror for the realisation of the “Caadre” mirror, designed by Philippe Starck. More recently, in 2012, Fiam launched “Macramè”, a collection of coffee tables with a hand-interwoven spun glass base.

Designers play a fundamental role, starting from the founder which designed several products for Fiam, from its beginnings up to more recent years. Over the time, Fiam developed a very rich and prestigious portfolio of collaborations with world-renowned designers, including Philippe Starck, Marcel Wanders, Daniel Libeskind, Cini Boeri, and Vico Magistretti, that enabled it to become successful and competitive worldwide. Some of its products are actually exhibited in 25 international museums, among which the Museum of Modern Art (MoMA) in New York.

As stated by the CEO, Fiam embraces a wide concept of design, which involves both aesthetic and functional features of the product:

“We have experienced the effectiveness of conceiving the product of design as a dynamic and versatile object, which permits the customers to become co-authors of a unique work.”

Moreover, several custom-made products have been conceived to tailor the needs of more demanding and evolved customers. For instance, “Rialto”, “Rialto L” and “Luxor”, offer various possibilities of customisation, both in terms of finishing and measures.

Hence, it can be said that innovation within Fiam is based on the strategic use of design combined with an overall effort in integrating the search for beauty with the consumers’ needs. As pointed out by the CEO, technological research is fundamental for the realisation of Fiam’s products:

“We have a high level of craftsmanship combined with high technology. Moreover, we own an instrument that controls the ovens and the success of glass bending. We are not improvising; our success is the result of forty years of experience.”

What contributes the most to Fiam's successful approach is not only the use of high technology but the search for continuous innovation. In fact, for developing some projects, Fiam developed “ad hoc” technologies as in the case of the water-jet process for the realisation of the “Hydra” table, proposed by Massimo Morozzi in 1982.

Other factors underlying the success of innovation within Fiam have emerged during the numerous interviews. Firstly, the high attention to each phase of the production process - from the initial melting phase of the glass, up to the stress tests carried out during the final perfection checks. During the development of the new product, a series of controls are carried out to comply with specific production and process standards. Another critical factor is represented by human craft skills. For instance, the process of glass bending requires different approaches. Indeed, it is necessary to pilot and monitor the right temperature of the slab at every point, to move correctly the mold, to choose the most appropriate tool to shape the glass, and to maintain a balanced condition between the solid and the liquid state.

The direct involvement of the owner during the enhancement and the development of innovation activities also emerged as a crucial factor. As previously discussed, the founder of the company designs several products. Notably, he personally authored the new product development processes by providing the original initial idea and supervising the process. This required a strong collaboration between the designer and all the people involved in the different stages of the new product processing. Thus, Fiam's founder not only acts as a supervisor in the innovation process, but he also interacts continuously with the various employees involved in the project within the company. This involvement also occurs when a designer outside the company proposes the idea of a new product. Therefore, the participation of the family in national and international events fosters innovation within Fiam, as it contributes to inspiring their innovativeness.

Lastly, external contributions provide significant benefits in terms of innovation management. In addition to the collaborations developed with several world-renowned designers, Fiam largely benefits from other partnerships established with other companies operating in the same geographic area (central Italy) as a single unit of an Italian Furniture District. Thanks to the collaboration with Biesse Group, for example, Fiam has gained several advantages both in terms of economic growth and of product and process innovations.

5.4.3 Fiam’s approach towards environmental issues

Since its origins, Fiam has showed increasing attention towards environmental issues. Glass is the main raw material used in manufacturing processes. As stated by the founder:

“Glass is natural, as it mainly consists of sand and lime. It is aseptic, non-toxic and does not release any harmful substances. Glass is eternal and can be endlessly recycled, without waste.

For all these reasons, it has always been the soul of Fiam and the main reason why we try to valorise all its virtues through production processes that are carried out in line with environmental and social standards."

Despite the gradual introduction of other materials in production processes – such as steel and wood- in order to carry out the projects of its designers, Fiam has always been focused on glass, both to enhance its leadership in this particular sector and to reduce the environmental impact of its activities. As stated by the CEO:

"Fiam is actively re-using raw materials from leftover production in order to manufacture other innovative and unique products, and the introduction of the DV Glass® represents a good (and rare) example of the company's commitment towards environmental issues."

In fact, the company is committed to waste and garbage reprocessing activities, and it is planning the adoption of renewable energies for the near future. In this regard, fiscal and economic incentives for investments in R&D activities, renewable energy plants and waste collection systems have emerged as crucial factors for supporting the implementation of environmental practices.

In operational terms, the sustainable approach of the company is revealed through the adoption of the UNI EN ISO 9001 process certification concerning the adoption of a quality system aimed at achieving a zero-defect product objective and providing quality management practices to customers and business counterparts. Further evidence is represented by the adoption of specific packaging policies, as most products are packaged in recycled wooden boxes, based on FAO guidelines. The wooden packages undergo special treatment, consisting in a sterilisation process at 80°, in order to obtain a completely bacteria-free material harmless both to the environment and to the products.

It is important to highlight that the implementation of such practices resulted both in an improvement of Fiam's environmental performance and, as we will see in the following sections, in the realization of new furnishing elements characterized by a strong combination of design and environmentally sustainable features.

5.4.4 An environmentally sustainable innovation: the case of DV Glass®

DV Glass® has been designed by the company's founder, Vittorio Livi, and one of his sons, Daniele, hence the reason behind this acronym. Born in 2012 with a project titled "Polychromy", the original idea was to reinvent the glass by optimizing all stages of the value

chain - starting from the procurement of raw materials to the final consumption - and by fully embracing environmentally sustainable principles.

DV Glass® is an innovative glass obtained from the re-assembly of glass strips, thanks to a high-temperature melting process. In particular, during the manufacturing process, the waste from the glass strips are further cut into several pieces and then re-assembled into a new sheet whose thickness matches with the width of the band. Thereafter, the new surface undergoes a high-temperature treatment, more precisely a thermal process with temperatures of about 900°C, which allows the previously selected coloured strips to be melted and, thus, to be recycled. The result of this innovative working process is a melted glass, masterfully handmade and characterized by different combinations of colours and thicknesses, which can be planned or completely random to improve the originality of the final product.

The contribution, creativity, and entrepreneurial foresight of the company's founder, as well as those of his son, have been crucial factors in the development of the DV Glass® project. In particular, their creativity and entrepreneurial foresight revealed their importance both for inspiring the initial idea and for driving the company’s departments towards its practical implementation. For several months, they worked alongside their skilled artisans, which were involved, day by day, in the different steps of the assembly and fusion phases, up to the final result. Several investments and technical attempts were necessary to the realization of this innovative project. Numerous meetings and discussions with different specialists, including engineers, designers, marketers, and other specialists, enabled Fiam to involve several skills around the DV Glass® project, and to assess economic and technical feasibility as well as its potential appreciation from the consumer’s side. The values of creativity, entrepreneurship, and environmental responsibility, along with the family's orientation towards innovation and technology, turned out to be the fundamental factors in the definition of the company's long-term strategy, thus acting as a filter for ideas in the different projects submitted by designers.

The high quality of the DV Glass® is ensured by a rigid quality control system aimed at guaranteeing the compliance with the international standard UNI EN ISO 9001. The uniqueness of the outputs lies in the non-repetition of the execution of the manufacturing process: the high variability of the melting process, along with the strong craftsmanship required in the pre-assembly phase, leads to a new glass sheet, which is quite different from the previous one and, thus, never identical to the next one.

The introduction of the DV Glass® enabled the company to reach a target of customers that requires both high-quality and custom-made products. Furthermore, the use of DV Glass® has contributed to strengthening the company's ability to reach consumers who are increasingly sensitive to ethical and environmental values. In this regard, the collaboration with designers, particularly young ones, has proved to be particularly effective due to their ability in understanding consumers' new needs and expectations.

An additional crucial factor in the success of the DV Glass® project lies in the company's communication strategy. The DV Glass® project was presented during the Salone del Mobile in 2018, to strengthen the innovativeness of Fiam and, above all, to enhance its environmental approach within the furniture sector. During the last edition of the Salone del Mobile in 2019, several interviews with the designers were organized in order to show how the original idea was born and to talk about the evolution of the relationship between the company and the designers. Moreover, these interviews have been shared on the company's social media channels in order to increase their visibility.

Concluding, the CEO pointed out some technical difficulties, mainly related to the composition of raw material, that Fiam had to face during the development of the DV Glass® project. For these main reasons, technical investments and training activities aimed at instructing existing personnel have been developed.

5.5 DISCUSSION AND MANAGERIAL IMPLICATIONS

This study aims at pointing out unexplored dimensions of innovation within the context of SMEs, particularly in a family business, by focusing on how environmental issues can be integrated into new product development processes. In this sense, the present study is willing to enrich the ongoing debate on innovation within the context of family SMEs, while also suggesting managerial implications.

From a theoretical standpoint, three main contributions emerge from this study. Firstly, it investigates how innovation is developed and managed by SMEs, instead of focusing only on the antecedents and outcomes of the innovation process (Kallmuenzer and Scholl-Grissemann, 2017; Curado et al., 2018). By observing the development of the DV Glass®, the study deepens this process, investigating the main steps and figures involved. Notably, the Fiam case study proves to be valuable in the theoretical debate about ownership and its influence on the innovative approach inside a family business (De Massis et al., 2013). Indeed, it confirms the

existence of a positive relationship between ownership involvement and innovation output. In the specific case of the DV Glass® project, the ownership actually inspired the initial idea and provided further financial, managerial, technical, and operational support for its realization. Therefore, the results of this study demonstrate the effectiveness of the involvement of the owner in the innovation development, thus confirming past research (Sirmon and Hitt, 2003; Miller and Le Breton-Miller, 2005).

Secondly, the study contributes to the theoretical debate on the relationship between family SMEs and environmental issues. The findings confirm the past studies which highlighted the commitment of SMEs in environmental practices (Craig and Dibrell, 2006; Gadenne et al., 2009). Fiam has always paid great attention to environmental issues, basing its core business on glass processing. Over the years, it has gradually improved its environmental approach by obtaining environmental certifications and adopting practices to improve its ecological efficiency. The company has improved its ability to integrate environmental practices into product design elements, as demonstrated by the DV Glass® project. Following the principles of eco-design, Fiam has involved every phase of the value chain in order to create a new product that meets both environmental sustainability and innovation. Thus, the Fiam case study represents an interesting example of how the adoption of environmental practices could lead to the realisation of innovative design-based products within family SMEs, on which very scarce literature exists (de Jesus Pacheco et al., 2017). By considering the concept of eco-design, which is strictly related to circular economy (MacArthur, 2013; European Commission, 2015), this study provides evidence that also family SMEs are able to implement circular business models, thus benefiting from the potential link to such practices (Barbaritano et al., 2019), as well as other advantages in terms of differentiation strategies (Ahmad et al., 2018).

A final contribution to the theoretical debate concerns the relationship between family SMEs and the execution of open innovation (Popa et al., 2017). Although recent studies highlighted a scarce propensity of such firms towards open innovation (Hochleitner et al., 2017; Gentile-Lüdecke et al., 2020), the Fiam case study represents an example of a very “open” company, as it heavily relies on several collaborations with designers and actors operating within the surrounding environment (e.g., companies operating in similar contexts, suppliers, etc.).

Concerning the practical implications, several suggestions can be drawn from this study. Entrepreneurial inventiveness emerged as a crucial factor for affecting family SMEs’ willingness to innovate and to integrate sustainability issues within innovation processes, thus confirming

prior research on these topics (Rezai et al., 2016; Falahat et al., 2018). As shown by Fiam, if the management strongly believes in the potentials that can arise from the implementation of environmental practices, its greater commitment could facilitate the development of innovative processes on a practical level. This is also in line with the main findings of *Chapter 4*, where an increasing awareness about circular economy and sustainability issues emerged within the furniture sector. By increasing the involvement of all employees, the company may be able to achieve better performances, as everyone within the company would feel a sense of belonging to a unique entity. Moreover, the development of a more slender and functional organization can be particularly useful for enhancing different collaborations, both with external actors and stakeholders and within the company. In this latter case, an adequate communication, along with informal and scheduled meetings between management and employees, can trigger innovation through the sharing of new ideas and the involvement of the staff in environmental projects and practices.

The findings of this study also contribute to strengthening the relevance of industrial clusters based on the development of strategic partnerships between actors and stakeholders. In this regard, Fiam declared to be involved in several partnerships within the furniture district in which it operates. These collaborations are proving their effectiveness for the development of environmental practices and related innovations. Also in this context, management plays a fundamental role, as its relationship networks enable the company to benefit from additional financial, technological, and innovative resources, as well as commercial and communicative skills.

Further suggestions refer to the economic limitations and the lack of investments in R&D that often characterize family SMEs, like Fiam (Terziovski, 2010). This case study confirms their relevance, as they could limit the practical implementation of environmental innovation practices, as widely discussed in *Chapter 4*. Several investments in R&D, technology, and marketing, as well as appropriate equipment, have been necessary for the development and subsequent monitoring of the DV Glass project.

Additionally, an adequate level of consumers' knowledge proved its relevance in motivating innovation enhancements within SMEs. As highlighted by Fiam, innovation should meet consumers' expectations, both in terms of design and environmental sustainability. For these reasons, innovation should be driven by market demand. Here, lies the crucial role of the marketing department, as it can improve internal communication and facilitate a raise of

awareness towards the consumer culture inside all the different departments within the company (Srivastava et al., 2001). In this regard, units with customer-facing responsibilities (e.g., sales, customer service, logistics) should ensure greater attention to the costumers' needs. By doing so, companies could use these suggestions as new ideas for their products development.

Finally, external communication revealed itself as a critical factor in the success of the innovation. The communication strategy used by Fiam with regard to the DV Glass® and related collections has been very effective. This strategy was based on relational and direct activities, including participation in trade fairs and exhibitions in museums, in order to provide clients with the opportunity to learn more about the company and its offer (Millán and Díaz, 2014). Communication strategies based on this approach could be very effective, as they can increase brand loyalty and share the company's values. This type of communication strategy could also be used by exclusive design brands to highlight their commitment to environmental issues. In this regard, as suggested by Fiam, the use of social media, as well as other strategies developed by other actors involved in the value chain – including resellers and agents – could be considered as flexible and powerful tools.

5.6 CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The present study provided empirical evidence that environmental sustainability can be considered as an innovative and powerful force in generating new processes and products within family SMEs (Wu, 2017). Based on one of the main principles of circular economy, namely recycling, Fiam has recently developed the idea of recycling waste from production processes to create innovative products, while preserving their design and quality. The result is an innovative type of glass (i.e. the DV Glass®) - introduced in the market in 2018 - that stands out for its depths and colours. Furthermore, it has allowed the company to strengthen its orientation towards sustainable issues through an attractive combination of design, innovation, and sustainability.

The adoption of the single case study approach in the present research entails certainly some limitations, mainly related to the generalisability of the results and to the subjectivity of the researcher's interpretation (Vissak, 2010; Grant and Verona, 2015). These limitations combined with the inconclusiveness of prior studies investigating the relationships between family SMEs,

environmental practices, and innovation (Triguero et al., 2013; Zhang and Chen, 2014; Dey et al., 2018), suggest the need for future research in this area.

Further qualitative analysis with exploratory purposes could be generated from a cross-comparison. In fact, while being particularly suitable in addressing questions such as "how" and "why" (Eisenhardt and Graebner, 2007), multiple case studies are also able to identify similarities and differences among the different cases (Yin, 1981), thus providing a better comprehension of the phenomenon investigated. This could be particularly useful, given the heterogeneity of SMEs in terms of both organisational and structural characteristics (Reyes-Rodríguez et al., 2016). Future studies could be focused on these features – including size, degree of involvement in the ownership, internationalisation, and sustainable management approaches - to provide further evidence of their effects on the implementation of innovative processes within SMEs and, more broadly, of their propensity towards environmental innovation. In turn, these suggestions could provide new perspectives for understanding the development of innovation within SMEs.

Given the crucial role of the involvement of the ownership in the innovation process, future research could also concern the development of a longitudinal case study. In particular, the analysis should investigate the evolution of innovative and eco-design processes as a response to structural changes in the ownership structure (e.g., through an equity sale or new equity issuance).

Future studies focused on sustainability management tools, especially on communication strategies, could be further useful for family SMEs. Sustainability reporting could help companies in strengthening their competitive advantage (Morioka et al., 2017), in addition to traditional tools (e.g., companies' catalogues, brochures, websites, etc.). However, many businesses in this category typically underinvest in these communication strategies, mainly due to the fact that sustainability practices are generally intuitive and not formally structured (Cohen, 2017). Hence, the need to further investigate these topics.

Concluding, starting from the contradictory results of prior research on innovation in the context of family SMEs (Hossain and Kauranen, 2016; Santoro et al., 2018) and, given the successful approach of Fiam, it might be interesting to deepen how some SMEs' features (e.g., non-economic goals, cultural mindset, and the organizational structure of ownership), can enable or hinder open innovation.

CHAPTER 6

THE QUANTITATIVE STUDY:

Consumers' perception of design and factors affecting their purchasing intention

6.1 INTRODUCTION

After having analysed the companies' attitudes and behaviours towards the implementation of sustainability and sustainable innovation practices in eco-design products, the research moved on the consumers' perspective by investigating the role of design in their decision-making and purchasing processes.

Past research (Brown, 2008; Noble and Kumar, 2010) have highlighted the role design plays in affecting consumers' behaviour, especially concerning their purchasing intention (Kim and Ko, 2010; Hanzaee and Andervazh, 2012; Hashim et al., 2014). Notably, design attributes that are in line with consumers' needs and expectations can lead to more satisfying experiences, thus improving the relationship between consumers and companies (Gilal et al., 2018). This can contribute to enhancing the strategic role of design, both in terms of companies' competitiveness and innovation (see *Chapters 1* and *2*). Nevertheless, consumers' daily interactions with various objects, especially furniture products, can result in subjective perceptions of the design attributes, thus producing different responses (Luchs and Swan, 2011). Moreover, literature often distinguishes between the different dimensions of the design. In detail, a number of scholars (Bloch, 2011; Srinivasan et al., 2012; Homburg et al., 2015) proposed a three-dimensional conceptualisation of design which includes aesthetic, functional and symbolic dimensions, even though there is still little consensus about their core elements. The above dimensions can be differently perceived by consumers and can impact on their attention and behaviours in different ways. Hence, the need to further investigate this topic emerges, especially concerning the furniture sector on which the literature is still sparse to the author's knowledge.

Starting from the above assumptions, this step of the research addressed the following research questions:

RQ3: How do consumers perceive the different dimensions (functional, aesthetic, symbolic) of design? Which attributes most affect their perception?

RQ4: To what extent the design attributes (i.e. functional, aesthetic, symbolic) impact on consumers' purchasing intention?

Understanding how consumers perceive the concept of design with regard to furniture products and its effects during the purchasing process might be useful for companies to identify the main factors on which they should focus to attract consumers and to satisfy their needs.

Given the increasing attention of consumers towards environmental issues (Skogen et al., 2018) and the critical role of eco-design practices for companies' innovation and competitiveness (see *Chapter 2*), the present study also considered the potential role of consumers' environmental concerns on the relationship between design and purchasing intention. The overall aim was to understand whether and how the individual concern towards environmental issues can affect the perception of design attributes and the purchasing intention of design furniture products. Therefore, a further research question rose as follows:

RQ5: To what extent consumers' concerns about environmental issues influence their perception of design attributes and their purchasing intention of design furniture products?

By addressing the RQ5, useful insights were gained to understand the economic convenience for companies to invest in environmental strategies, including eco-design practices, with the aim to improve their relationships with consumers and to sustain their long-term competitiveness in the furniture sector. Both RQ4 and RQ5 have been converted into testable hypotheses to provide possible causal paths between constructs.

The rest of the Chapter is organised as follows. Section 6.2 provides a theoretical background of the variables involved in the study along with the hypotheses development. Methodology, sampling procedure and data processing are discussed in Section 6.3. Findings and the main considerations of the study are presented, respectively, in Section 6.4 and Section 6.5. Finally, conclusions, limitations and future research directions are outlined in Section 6.6.

The main results of this study have been recently presented at the XVII SIM Conference "Marketing for a better society" (October 28-30th, 2020). The extended abstract, co-authored by Elisabetta Savelli and me, is now available online in the Conference Proceedings Section[34].

6.2 THEORETICAL BACKGROUND AND HYPOTHESES

6.2.1 Purchasing intention

The construct of purchasing intention has always received great attention both from academics and practitioners, especially in recent years. According to Wee et al. (2014), the intention is the cognitive representation of the will to adopt a behaviour. In particular, as cited in Mirabi and colleagues (2015), Morinez et al. (2007) defined the purchasing intention as a situation in which consumers are more likely to buy certain products depending on particular circumstances, and to repeat this purchase in the future, while resisting the switch to other brands (Diallo, 2012).

Over the years, several authors from different sectors, such as the automotive industry (Jalilvand et al., 2011) and social media advertising (Alalwan, 2018), have analysed this construct by adopting a behavioural approach. The studies of Lusk et al. (2007) and Wee et al. (2014) demonstrated the existence of some variables aimed at measuring consumers' willingness to purchase a specific good or service. Similarly, the results of Jalilvand and colleagues (2011) revealed that brand awareness, brand loyalty, and perceived quality of products have a significant impact on consumers' purchasing intention. More recently, Alalwan (2018) identified other factors, including hedonic motivations, habits, and perceived relevance. Among several approaches, the Theory of Reasoned Action (Fishbein and Ajzen, 1975) and The Theory of Planned Behaviour (Ajzen, 1991) argued that several factors, including attitudes and beliefs of individuals, can be regarded as predictors of their purchasing intentions.

Overall, the number and variety of these studies suggest that consumers' decision-making processes are very complex in nature. Moreover, there is still an open and controversial debate on the relationship between intention and behaviour. While some scholars (Morwitz, 2014; Wee et al., 2014) argued that consumers' intentions do not necessarily translate into purchasing behaviour, others (Lee and Lee, 2015; Wang et al., 2018) pointed out that the

[34] Barbaritano, M., & Savelli, E. (2020). How environmental concerns affect the relationship between design attributes and purchasing intention. In *Il Marketing per una società migliore-XVII Convegno Annuale della Società Italiana Marketing*. Available at: http://www.simktg.it/sp/sim-conference-2020.3sp.

greater the intention is, the greater will be the likelihood for the consumer to buy a certain product. This second perspective is more widespread among managers, who tend to consider purchasing intention as one of the main indicators to assess the consumers' responses to products, especially when companies are planning to launch new ones (Morwitz, 2014). In this regard, a better understanding of consumers' purchasing intention can be very helpful for companies to understand the market demand and, consequently, to affect the consumers' buying processes.

Based on this assumption, purchasing intention has been considered as a predictor of consumers' buying behaviour with the aim to analyse how the design attributes of a product can influence such behaviours. In this regard, the furniture setting is particularly interesting, as very few studies which investigate the specific relationship between design features of furniture objects and consumers' intention to buy have been found until now (Zwierzyński, 2017; Xu et al., 2020).

6.2.2 Design

The strategic role played by design in companies' innovation and competitiveness has gained increasing recognition over the last decades. Several studies (Noble and Kumar, 2010; Landoni et al., 2016; Hernández et al., 2018) showed that investments in design have a positive influence on companies' ability to innovate and, consequently, on their competitive performance. However, as discussed in *Chapter 1* of this thesis, a common and accepted definition of the design concept has not been identified yet (Ralph and Wand, 2009; Luchs and Swan, 2011).

Based on prior research (Simon, 1969; Kotler and Rath, 1984), design can be considered as a human activity that includes both the dimension of creativity and of technique. In addition, design activities may be aimed at different purposes, including the modification of a previously manufactured product, to improve its functional and aesthetic characteristics (d'Ippolito, 2014).

As pointed out by Homburg et al. (2015), a consistent stream of research (Dhar and Wertenbroch, 2000; Chitturi et al., 2008; Landwehr et al., 2013) has provided product design indicators that focus on only one dimension at a time. However, this methodology has proved to be rather limited, as more recent studies (Srinivasan et al. 2012; Homburg et al., 2015) tend to consider design as a three-dimensional construct that includes aesthetic, functional and

symbolic dimensions. In particular, Homburg and colleagues (2015, p. 44) stated that the first dimension “refers to the perceived appearance and beauty of a product”, while the functional dimension “reflects the consumer’s perceptions of a product’s ability to fulfil its purpose”. Finally, the symbolic dimensions “refers to the perceived message a product communicates regarding a consumer’s self-image to both the consumer and others on the basis of visual elements”. The conceptualisation of product design as a set of elements that consumers are able to perceive and organise in a multidimensional way has been increasingly adopted in literature, as well as it has been in this study (Homburg et al., 2015).

Past research (Noble and Kumar 2010; Bloch, 2011) demonstrated that a product design which is consistent with consumers' needs and expectations can influence the consumer’s behaviour. Hanzaee and Andervazh (2012) demonstrated the existence of a positive relationship between product design attributes and consumer purchasing intentions in the context of the cosmetics industry. Similar results came from other fields, such as luxury brands (Kim and Ko, 2010) and the automotive sector (Hashim et al., 2014). In a more general way, the results of a study carried out by Arboleda and Alonso (2014) showed that design awareness, defined as the ability of consumers to recognize the attributes that have been incorporated into an object for instrumental and/or symbolic purposes, can be considered as a valid explanation for their purchasing intentions.

Concerning the specific dimensions of design early discussed by Homburg et al. (2015) - namely aesthetic, functional, and symbolic - their effects on consumers’ behaviours have been scarcely investigated by prior research, since this mainly focused on the general concept of design, without distinguishing between its components. The study of Homburg and colleagues (2015), by linking each dimension to key outcomes of consumers’ behaviour, represents a first step in this direction. Notably, with respect to purchasing intention, they found out that the aesthetic characteristics of a design product directly influence consumers' evaluations and, consequently, their desire to own the product as well as their decision to buy it (Yeung and Wyer, 2005; Reimann et al., 2010). Secondly, the functional attributes are regarded as "a reliable indicator of functional performance" (Hoegg and Alba, 2011, p. 346), which can improve the likelihood of purchase. Finally, the symbolic dimension, intended as the set of meanings associated with the product, can affect the consumers’ behaviour (Belk, 1988; Sirgy, 1982; Tian et al., 2001), since individuals are highly aware of their social identity and, therefore,

they may be more likely to buy design-based objects that allow them to elevate their social status and/or to maintain their self-concept.

Overall, the literature on this topic suggests the existence of a positive relationship between the perception of design attributes and the consumers' purchasing intentions. However, to the author's knowledge, no contributions have been found concerning the specific context of the furniture sector. The same contribution of Homburg et al. (2015), which demonstrated a positive relationship between different dimensions of design and purchasing intentions, was product category-independent, and was, thus not providing any suggestions for the furniture industry here analysed.

Hence, based on previous evidence, the first hypothesis of this study is proposed as follows:

H1: The perception of design attributes positively influences the purchasing intention of design furniture products.

Moreover, according to Homburg and colleagues (2015), it is likely to suppose that the effect of the symbolic dimension on purchasing intention could be greater than that of the functional and aesthetic ones also in the furniture setting, as furniture products enable consumers to express their self-identities. Prior study of Bumgardner and Bowe (2007), indeed, "stressed the importance of product image and moving beyond a commodity mentality in the furniture industry". That is, consumers often base their purchasing decision on the extent to which a furniture product communicates a sense of self-identity, based on its psychological meanings and emotional appeals (Bumgardner and Bowe, 2007; Lindberg et al. 2013). Therefore, the first hypothesis can be refined as follows:

H1.1: The symbolic dimension of a design furniture product positively influences the purchasing intention of consumers more than the aesthetic and functional dimensions do.

6.2.3 Environmental concerns

The increasing awareness that the traditional production and consumption systems are damaging the health of our planet is becoming ever more evident, thus widening the debate on corporate and consumers' responsibility. There is a need to act upstream on the various production and consumption processes, instead of simply reducing their negative effects. In this regard, several initiatives have been promoted by various institutions, both at international and national level, including end-of-product cycle policies based on neutralising the negative

environmental effects of industrial products, redesigning products and/or services, economic and fiscal incentives, and many others.

This increased awareness has also led to a re-orientation of social behaviours, including the incorporation of sustainable practices into companies' activities and the increasing demand for sustainable products and services by consumers. Companies, for their part, are becoming increasingly conscious of the need to adopt sustainable policies with the aim of minimising negative environmental and social impacts. Furthermore, legislation and society itself are demanding that innovation in products, services, processes, and business models should be accompanied by a greater responsibility for a more sustainable development (Kneipp et al., 2019). As a consequence, a number of strategies have been gradually adopted by companies related to circular economy and eco-design approaches (e.g., LCA, MECO matrix, Design for X approach, see *Chapters 2*, *4*, and *5*) in order to improve their performances both in terms of innovation and competitiveness (Gerlitz and Prause, 2017).

Considering the consumers' perspective, it can be stated that their concerns about environmental issues are constantly changing their lifestyles, especially concerning their purchasing behaviours, thus leading them to adopt more responsible behaviours (Morgan et al., 2016). Generally speaking, environmental responsibility has been previously defined as "a state in which a person expresses the intention to take direct action to remedy environmental problems - acting not as an individual consumer with his or her own economic interests, but through a citizen-consumer concept of social and environmental well-being" (Stone et al., 1995, p. 601). Notably, Stone and colleagues (1995) assumed that the concept of environmental responsibility is made up of five dimensions, including: 1) an attitude that expresses concern for the environment; 2) knowledge and awareness of environmental issues; 3) the adoption of behaviours that consumers consider ecologically responsible; 4) a willingness to act; and 5) an adequate level of control and skills necessary to act on environmental issues. Overall, it can be said that consumers' environmental responsibility covers all the consumption activities that cause less damage or bring benefits to the environment, compared to traditional behaviours.

As stated by Yue et al. (2020), environmental responsibility derives from the norm activation model proposed by social psychology. Later, this approach has been applied in several disciplines, including consumer behaviour, education, and environmental sociology (Slavoljub et al., 2015). This model argues that the sense of responsibility is an individual state of mind regarding the adoption of altruistic behaviour based on personal norms (Schwartz, 1977). More

in detail, when an individual internalizes social norms into personal norms, his/her sense of responsibility will be activated. With reference to proactive environmental behaviour, environmental responsibility is considered the fundamental psychological variable, as it will encourage individuals to pay close attention to environmental issues. This could motivate them to take responsibility for protecting the environment and, therefore, for adopting proactive environmental behaviours. In this respect, Stern et al. (1999) have demonstrated that there is a high correlation between environmental responsibility and such behaviours, arguing that if individuals have a high sense of environmental responsibility, they will be more likely to engage in pro-environmental actions. Furthermore, several studies demonstrated the positive effects of consumers' environmental concerns on their purchasing intention. For example, Costa Pinto and colleagues (2014) proved that when individuals are very attentive to their identity, there is a greater propensity for sustainable consumption, especially by women, due to substantial biological differences and their social experiences. Similarly, Kaiser and Scheuthle (2003) have shown the existence of a positive relationship between the environmental responsibility of the Swiss population and its pro-environmental behaviours.

Despite the above evidence, very little attention has been devoted to the relationship between consumers' environmental concerns and their behaviours towards design products, especially in the furniture setting. Based on previous studies (Lin et al., 2013; Magnier and Crié, 2015), it is likely to suppose that the consumers' consciousness towards environmental issues could positively affect their purchasing intention of eco-design products. For instance, Xu and colleagues (2019) demonstrated that individuals with a high sense of responsibility towards environmental issues are more likely to purchase an environmentally friendly car. More generic results regarding the purchase, use, and disposal of eco-design clothing have been provided by Jin and Cui (2019). However, it is also likely to suppose that some design attributes of a product could be a source of concern for those individuals that are environmentally involved, as they tend to be more focused on the quality of the object and the solutions they provide rather than on the production of highly stylised objects with limited durability and use (Beverland, 2011). This could be particularly evident when referring to design furniture products, whose production processes require the use of a considerable amount of raw (e.g., wood, metals, etc.) and other industrial materials (e.g., pain, plastic, solvents, etc.). However, to the best of the author's knowledge, no contributions focused on the relationship between consumers' environmental concerns and their purchasing behaviours of design products have been found

concerning the furniture setting. Hence, on this basis, the following hypothesis has been proposed:

H2: Consumers' environmental concerns negatively affect the purchasing intention of design furniture products.

Moreover, the consumers' awareness about environmental issues could also affect the way that the design attributes of a product influence consumers' purchasing intentions. It has been previously supposed that the perception of design attributes directly influences consumers' purchasing intention. Nevertheless, as earlier discussed, the design concept can be defined along different dimensions concerning the functionality, aesthetics, and symbolism of a product. In this respect, Arboleda and Alonso (2014) considered environmental features as a part of the symbolic dimension of an object, since these aspects strictly concern the relationship between the product and the individual himself (Bürdek, 1994). Based on this reasoning, it can be supposed that when consumers are highly involved in environmental issues, their purchasing intention is mostly affected by the perception of the aesthetic and symbolic attributes of the design. On the contrary, when the individual attention towards environmental issues decreases, the purchasing intention of a design product is mostly influenced by the functional dimension of the design. In a more general way, it can be supposed that consumers' environmental concerns moderate the relationship between design attributes and purchasing intention. Therefore, the last hypothesis of this study has been formulated as follows:

H3: Consumers' environmental concerns moderate the positive relationship between design attributes (i.e., functional, aesthetic, and symbolic) and purchasing intention.

Table 0.1 in the *Introduction* (see page 15) recaps the research questions and hypotheses of this study.

6.3 METHODOLOGY

6.3.1 Instrument and data collection

Data for this study were collected through a self-administered questionnaire carried out on a sample of Italian people. The questionnaire was distributed by using both the online and offline procedure, starting from June 2019 until March 2020. The online version was employed for its advantages mainly related to the sample composition. In fact, this methodology gives the researcher access to a large population that would be difficult otherwise to reach trough other

channels (Garton et al., 1997; Wellman, 1997). Moreover, the computer self-completion enables to yield more honest reporting of embarrassing attributes or behaviours (Link and Mokdad, 2005a, 2005b). Despite some limitations mainly related to fraudulent responses and technical difficulties (e.g., accessibility to Internet, junk mail, etc.), this procedure enabled to collect 317 filled questionnaires. The offline procedure was employed to increase the overall number of respondents, thus reaching the total number of 350 completed questionnaires. Notwithstanding some disadvantages related to costs and time efforts, this procedure enabled to examine consumers' behaviours in a real setting. Overall, 357 questionnaires have been collected, but 7 of them have been discarded due to their data incompleteness.

The questionnaire consisted of three sections (see *Appendix C*) exploring: (i) the socio-demographic characteristics of the respondents (i.e. age, education, occupation, marital and housing status), (ii) how design is perceived from consumers and to what extent it impacts on their decision-making processes when choosing a design furniture product, (iii) the role of individual concerns towards environmental issues. Respondents were asked to indicate their level of agreement to the statements on a seven-point Likert scale. The time required for completing the questionnaire was about thirty minutes.

6.3.2 Sample characteristics

The sample consisted of 350 respondents equally distributed between males and females. The majority of the respondents (more than 80%) were aged between 18 and 35, while 20% of them were over 35 years old, with a very small percentage of individuals aged 45 and over.

About 50% of the sample came from the regions of North and Central Italy, while the other 50% came from the south of Italy. Most of the sample had a high level of education, having a bachelor's or master's degree, as well as a Ph.D. degree. More than half of the respondents were students or unemployed, while the remaining 40% worked as employees or freelances. Only few workers (3.6%) had a Junior certificate, while the majority had a high level of education. Given the average young age of the sample, more than 80% were single. In fact, respondents were mainly students (61%), and shared their home with parents, brothers, and sisters (43.66%), or friends (10.57%).

Table 6.1 summarizes the socio-demographic information of the sample.

Table 6.1 – Socio-demographic information

Variables	Number (tot=350) and frequency (%)	
Gender		
Male	163	46.57%
Female	187	53.43%
Age		
18-24	113	32,29%
25-34	180	51,43%
35-44	34	9,71%
45-54	9	2,57%
55-64	9	2,57%
>65	6	1,71%
Area of Residence (ISTAT)		
Northern Italy	113	32,29%
Central Italy	57	16,29%
Southern Italy	181	51,71%
Education		
Junior certificate	13	3,71%
Baccalaureate	102	29,14%
Bachelor's degree	144	41,14%
Master's degree	64	18,29%
Ph.D./Master	27	7,71%
Occupation		
Student	181	51,71%
Worker	107	30,57%
Freelance	32	9,14%
Unemployed	31	8,86%
Marital Status		
Single	284	81,14%
Unmarried partner	38	10,86%
Conjugated	28	8,00%
Housing Status		
Live in a rented house	83	23,71%
Live in owned house	70	20,00%
Share the house with parents and brothers/sisters	128	36,57%
Share the house with husband/wife and children	38	10,86%
Share the house with friends/other students	31	8,86%

Source: personal elaboration.

6.3.3 Measures

Each construct was measured through single or multi-items scales previously defined in the literature.

According to Fishbein and Ajzen (1975), the intention expresses the probability of performing a specific behaviour as it represents the closest cause to intentional behaviour. Similarly to prior research (e.g. Kamins and Gupta, 1994; Pradhan et al., 2014), the purchasing intention (PI) was measured through a single-item scale, based on a seven-point Likert scale by asking "*How many times do you intend to purchase a design furniture product in the next future?*". The level of frequency was assessed as follows: 1= never, 2= rarely (in less than 10% of chances that I could

have), 3= occasionally (in about 30% of chances that I could have), 4= sometimes (in about 50% of chances that I could have), 5= frequently (in about 70% of chances that I could have), 6= usually (in about 90% of chances that I could have), 7= every time.

The main independent variable (i.e. design) was assessed by a 13-items, seven-point Likert scale measuring the consumers' agreement with some attributes defining the concept of design (1= strongly disagree, 7= strongly agree). The original scale of Arboleda and Alonso (2014) was used, with two minor adaptations: (i) the item "*it meets a specific purpose*" was divided into two items by considering the distinction between functional and symbolic values of design. This distinction is consistent with previous literature based on both the designer's perspective (Bürdek, 1994) and the consumer's one (Prentice, 1987); (ii) the original item "*anyone can use it*" was deleted given its similarity with the item "I understand how to use it", both concerning communication design approach. Consistent with the study of Echavarren (2017), the consumers' environmental concerns (CEC) were evaluated on a single-item scale based on the following question "*When you are going to choose a design furniture product, how much importance do you give to environmental issues?*". Answers were scored on a seven-point Likert scale (1= not at all important; 7= extremely important). Lastly, gender has been considered as a control variable in the proposed model.

Appendix D summarises the variables used in this study, along with their indicators and their main references.

6.3.4 Data processing

The research questions and hypotheses of this study have been addressed by using multiple methods and statistical analyses. After having analysed the socio-demographic characteristics of the sample, the first research question (RQ3) was answered through a preliminary Factor Analysis aimed at investigating the main attributes of design that affect consumers' perception. Then, further research questions (RQ4 and RQ5) were tackled by using the regression analysis, the test for differences and the SEM analysis. Firstly, the regression analysis was performed to assess whether and how consumers' purchasing intention of design furniture products is affected by their perception of design attributes (RQ4). The ANOVA and Kruskal-Wallis tests were further developed to address the RQ5, by splitting the sample into two sub-groups including respondents who are highly and lowly concerned about environmental issues. Given the positive response of the above tests, especially the Kruskal-Wallis one, the factor analysis

and the regression analysis were repeated for each sub-group in order to observe differences in consumers' perception of design and purchasing intention. Secondly, the SEM analysis was developed to deepen the relationship between design and purchasing intention (RQ4), by investigating the role of customers' environmental concerns as a moderator on such a relationship (RQ5) (Jöreskog and Wold, 1982). The SEM procedure revealed its usefulness also to provide statistical confirmation to the preliminary factor analysis applied to the design concept. All data were analysed using the statistical software SPSS (version 23) and WarpPls (version 7.0).

Figure 6.1 depicts the model under investigation along with the main research hypotheses.

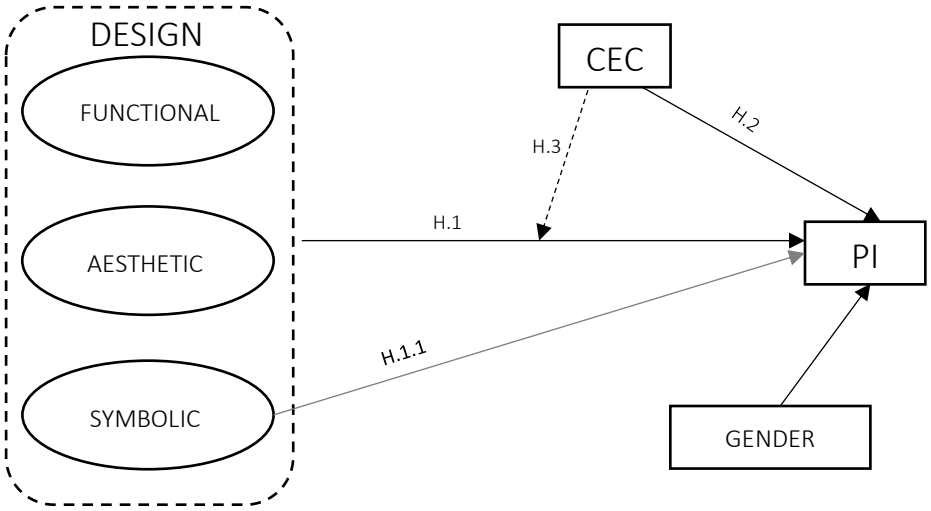

Figure 6.1 - Research Model

Source: personal elaboration.

6.4 RESULTS

6.4.1 The perception of design attributes: results from the Factor Analysis

In order to investigate how consumers perceive the concept of design with regards to furniture products, a preliminary factor analysis has been carried out; this enabled to group together the list of attributes defining the concept of design and to order them on a decreasing scale according to their importance (from the most to the least important). Before performing the factor analysis, the Kaiser-Meyer-Olkin (KMO) sampling and Bartlett's test of sphericity were performed to support its adequacy. As shown in Table 6.3, both tests have produced significant values. Moreover, the Cronbach's alpha value was computed to assess the overall reliability of the construct. The reliability was calculated for the items considered as set of variables and not

as a single value for each item (Santos, 1999). Alpha value greater than 0.60 suggested good reliability for the design construct (Nunnally and Bernstein, 2004).

The Principal Component Analysis (PCA) was employed (Pallant, 2020) and the Varimax rotation and Kaiser normalisation were applied as they enabled a better understanding of each component. After rotation of the Factor Matrix, only the items with factor loadings above 0.5 were retained for the analysis (Hair et al., 2010). Therefore, three items were deleted, namely DES_NOTIME, DES_ADDVALUE and DES_ENV. Notably, the PCA revealed that the positive impact of the product on the environment is not a determining variable in defining the consumers' perception of design, thus suggesting few associations between the sustainable attributes of a product and the design concept. By applying the Kaiser's criterion of eigenvalues greater than one (Kaiser, 1960) and the Cattell's scree test (Cattell, 1966), the attributes defining the design concept were grouped into three factors (see Figure 6.2).

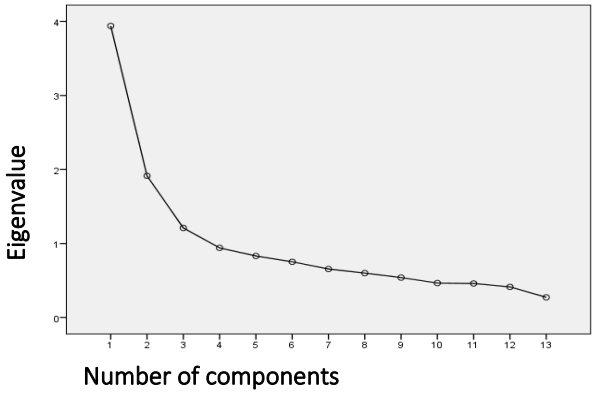

Figure 6.2 - Scree plot
Source: personal elaboration.

Based on their salient loadings (Hair et al., 2010) and on their similarities with the study of Homburg et al. (2015), the factors – which account for the 61,64% of the total variance - were labelled as FUNCTIONAL, AESTHETIC and SYMBOLIC.

Table 6.2 – Rotated component matrix

		Factor	
Variable	*1 - FUNCTIONAL*	*2 – AESTHETIC*	*3 – SYMBOLIC*
DES_EASYUSE	0.848	-	-
DES_NOTBREAK	0.783	-	-
DES_FUNCNEED	0.751	-	-
DES_COMFORT	0.678	-	-
DES_MYSTYLE	-	0.781	-
DES_NICESEE	-	0.717	-
DES_HEDONEED	-	0.622	-
DES_CREATIVE	-	0.619	-
DES_SOCSTATUS	-	-	0.802
DES_UNUSUAL	-	-	0.760
% of variance explained	24.173	21.286	16.185
Kaiser-Meyer-Olkin Measure of Sampling Adequacy 0.720			
Bartlett's Test of Sphericity	Approx. Chi-Square	923.375	
	Df	45	
	Sig.	0.000	

Source: personal elaboration.

The first factor - labelled FUNCTIONAL - explains the 24.17% of the total variance and refers to the usefulness of an object. It is strictly related to the durability of the product and its ability in satisfying a functional need in a way that is comfortable and easy for the consumer. This is in line with Bürdek's (1994) study, showing that the functional dimension of design refers to an object itself, concerning what it is made for, how it works, and what its basic function is. The second factor – labelled AESTHETIC - explains the 21.29% of the total variance. It mainly refers to the aesthetic features of the product in terms of style, creativity, and pleasantness. This factor is strictly related to the ability of the product to satisfy a hedonic need of the consumer more than a functional one. Finally, the third factor - labelled SYMBOLIC - explains the 16.19% of the total variance. This refers to the characteristics of the product that can represent a user's identity (Prentice, 1987). As Bürdek (1994) highlighted, the symbolic function of a design product refers to the relationship between an object and an individual or a context, thus it may be associated with its ability to represent a particular social status for the user and to communicate the concept of uniqueness.

Overall, the factor analysis provided evidence for answering the RQ3 by demonstrating that the consumers' perception of design attributes is mostly influenced by the first two components, since they are the most important in terms of weight and variance explained. That is, the

perception of design is mainly related to the functional and aesthetic attributes of an object, which tend to be evident for the user, while the symbolic ones may not be.

6.4.2 How design attributes impact on purchasing intention: the Regression Analysis

In order to investigate how the different dimensions of design impact on consumers' purchasing intention of furniture products (RQ4), a regression analysis was firstly performed. Despite the value of R^2 indicates a low level of prediction of the model (it explains 12.5% of the variance in purchasing intention), the F-ratio (16.51) shows that the independent variables are statistically significant in predicting the dependent one ($p<0.05$), thus suggesting that the regression model is a good fit of the data (Table 6.3).

Table 6.3 – Model summary and fit

	R	*R^2*	*Adjusted R^2*	*Standard Error of the Estimate*	*Sum of squares*	*df*	*Mean square*	*F*	*Sig.*
	0.354	0.125	0.118	0.924					
Regression					42.257	3	14.086	16.511	0.000
Residual					295.172	346	0.853		
Total					337.429	349			

Source: personal elaboration.

From the coefficients table of the independent variables (Table 6.4), it can be said that only the symbolic dimension of design is statistically significant in predicting consumers' purchasing intention of design furniture products. This answers the RQ4, while providing partial support to hypothesis H1 (which refers to the overall perception of design) and full support to hypothesis H1.1 of this study (which concerns the importance of the symbolic dimension in affecting the consumers' buying intention).

Table 6.4 – Regression coefficients

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
(Constant)	4.302	0.257		16.724	0.000	3.796	4.808
FUNCTIONAL > PI	0.034	0.040	0.045	0.859	0.391	-0.044	0.112
AESTHETIC > PI	0.073	0.048	0.086	1.520	0.129	-0.022	0.168
SYMBOLIC > PI	0.191	0.035	0.300	5.490	0.000	0.122	0.259

Source: personal elaboration.

In particular, since the PCA revealed the symbolic attributes to have lower importance according to the consumers' perceptions, an attitude-behaviour gap seems to emerge after the regression analysis. On a perceptual level, the symbolic dimension of design has little relevance: the perception of consumers, in fact, is mainly focused on the functional and aesthetic features of the design. However, on a behavioural level, things change: the intention to purchase a design furniture product is mainly influenced by its symbolic dimension; in other words, it is influenced by the ability of the product to make the object unique and to strengthen the social status of the consumer who owns it.

6.4.3 The role of consumers' environmental concerns: test for differences

The next step of the analysis aims at examining whether and how the individual concern about environmental issues can affect the way consumers perceive the design attributes and their purchasing intention of design furniture products (RQ5).

The ANOVA test for differences was firstly developed to accomplish this aim. Hence, the original sample was split into two sub-groups according to their agreement with the following question: "*When you choose a furniture item, how much importance do you give to environmental issues?*" The measures were collapsed into a dichotomous variable, thus identifying consumers who are highly vs. lowly concerned about the environmental impact of the furniture object. Given that data were not normally distributed (as assessed by the Shapiro-Wilk test ($p>0.05$)) and given that the assumption of heterogeneity of variances was violated (as proved by the Levene's test for equality of variances ($p<0.05$)), the ANOVA test was not considered to be robust. Therefore, the Kruskal-Wallis test was performed, as it represents a non-parametric alternative of the ANOVA analysis. The test showed that there was a statistically significant difference in the willingness to purchase design furniture objects between the two groups of

respondents (χ^2=19.769; p=0.003; df= 6), with a mean rank score, respectively, of 715.15 and 506.66 for consumers that are lowly and highly environmentally involved.

After the Kruskal-Wallis test, the factor analysis and the regression analysis were repeated for each sub-sample with the aim to observe any differences in the consumers' perception of design and purchasing intention.

Tables 6.5 to 6.7 summarise the main results of the analysis.

Table 6.5 – Rotated component matrix – Sub-samples

	Factor			*Factor*		
	Sub-sample HIGH ENVIRONMENTAL CONCERN			*Sub-sample LOW ENVIRONMENTAL CONCERN*		
Variable	*1 - FUNCTIONAL*	*2 - AESTHETIC*	*3 - SYMBOLIC*	*1 - FUNCTIONAL*	*2 - AESTHETIC*	*3 - SYMBOLIC*
DES_EASYUSE	0.826	-	-	0.868	-	-
DES_NOTBREAK	0.768	-	-	0.845	-	-
DES_FUNCNEED	0.713	-	-	0.804	-	-
DES_COMFORT	0.683	-	-	0.659	-	-
DES_MYSTYLE	-	0.771	-	-	0.776	-
DES_HEDONEED	-	0.720	-	-	0.577	-
DES_CREATIVE	-	0.674	-	-	0.661	-
DES_NICESEE	-	0.669	-	-	0.711	-
DES_SOCSTATUS	-	-	0.816	-	-	0.883
DES_UNUSUAL	-	-	0.641	-	-	0.757
% of variance explained	23.236	23.227	14.383	27.305	20.281	19.777
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			0.719			0.727
Bartlett's Test of Sphericity	Approx. Chi-Square		636.398			375.991
	Df		45			45
	Sig.		0.000			0.000

Source: personal elaboration.

Table 6.6 – Model summary and fit – Sub-samples

	R	*R^2*	*Adjusted R^2*	*Standard Error of the Estimate*	*Sum of squares*	*df*	*Mean square*	*F*	*Sig.*
HIGH ENVIRON-MENTAL CONCERN	0.286	0.082	0.071	0.872					
Regression model					16.948	3	5.649	7.423	0.000
Residual					190.265	250	0.761		
Total					207.213	253			
LOW ENVIRON-MENTAL CONCERN	0.517	0.268	0.244	1.007					
Regression model					34.078	3	11.359	11.207	0.000
Residual					93.255	92	1.014		
Total					127.333	95			

Source: personal elaboration.

Table 6.7 – Regression coefficients – Sub-samples

	Unstandardized Coefficients		Standardized Coefficients			95,0% Confidence Interval for B	
Model	B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
HIGH ENVIRONMENTAL CONCERN							
(Constant)	4.820	0.293		16.467	0.000	4.244	5.397
FUNCTIONAL	-0.033	0.045	-0.046	-0.732	0.465	-0.123	0.056
AESTHETIC	0.055	0.053	0.070	1.028	0.305	-0.050	0.160
SYMBOLIC	0.154	0.040	0.254	3.872	**0.000**	0.076	0.232
LOW ENVIRONMENTAL CONCERN							
(Constant)	3.403	0.527		6.460	0.000	2.357	4.449
FUNCTIONAL	0.182	0.081	0.221	2.255	**0.026**	0.022	0.343
AESTHETIC	0.104	0.107	0.101	0.979	0.330	-0.107	0.316
SYMBOLIC	0.236	0.068	0.344	3.467	**0.001**	0.101	0.372

Source: personal elaboration.

The findings of the PCA are similar to those ones obtained from the general sample concerning both the list of the design attributes and their grouping into factors. However, this analysis suggests that consumers' perception of design changes between the two sub-samples. More specifically, when consumers are highly concerned about the environmental impact of an object, the functional and aesthetic dimensions are the most important factors in

determining the perception of design attributes. In the case of low concerns for environmental issues, instead, the consumers' perception of design is mostly focused on the functional dimension of design, while the aesthetic and the symbolic dimensions are quite similar in terms of weight and variance explained. They are mainly attracted by the fact that design can enhance a better use of the product as well as its durability and ease of use.

Overall, it can be said that the consumers' perception of design is mainly related to the perceived advantages in terms of functionality.

Concerning the relationship between design attributes and purchasing intention, the results regarding the individuals that are highly concerned with environmental issues are in line with those ones obtained from the general sample, while the purchasing intention of consumers with a low degree of attention towards environmental problems is affected by the functional attributes of design as well as the symbolic ones. In both cases, p-values are less than 0.05, leading, thus, to conclude that as far as consumers are lowly concerned with environmental issues, the above cited attitude-behaviour gap seems to be less evident. Indeed, both on a perceptual and on a behavioural level, these consumers are mostly attracted and influenced by the functional dimension of the design, even though the symbolic attributes proved to be always relevant in affecting their buying intention. All these findings provide relevant evidence for RQ5.

6.4.4 SEM Analysis

The SEM analysis - carried out on the general sample – enabled to confirm the findings of the preliminary factor analysis, as well as to deepen the relationship between design and purchasing intention, by addressing all the specific research hypotheses. Consumers' environmental concern was considered as a moderating variable in this step, according to a moderator construct approach, using the product of the exogenous variables FUNCTIONAL, AESTHETIC, SYMBOLIC and CEC (i.e. FUNCCEC, AESTCEC, SYMBCEC) (Sanchez, 2013).

The results of the measurement model are shown in Table 6.8. Multiple runs of SEM estimations were performed until all the items' loadings were greater than 0.70, thus removing the items with loading values under this threshold (Hair et al., 2010). The final estimation confirms the answer to RQ3 that emerged from the factor analysis previously developed, providing reliability values of the measurement model and the robustness of the constructs. Notably, the results of the composite reliability are all above the threshold of 0.7, which assures

the blocks' homogeneity, while some alpha values are in moderate range of 0.5 and 0.6, as recommended by Nunnally and Bernstein (1994). Moreover, the loading computation shows that the discriminant validity of the model is assured.

Finally, the results of the average variance extracted (AVE) for each variable can be accepted, as they exceed the threshold of 0.50 (Fornell and Larcker, 1981), thus establishing the convergent validity of the model.

Table 6.8 – Assessment of the measurement model

Variable	*Items*		*Cronbach's Alpha*	*Composite Reliability (Dillon Goldstein rho)*	*Average Variance Extracted (AVE)*
	Weight	*Loadings*			
FUNCTIONAL			0.781	0.860	0.605
DES_EASYUSE	0.345	0.837			
DES_NOTBREAK	0.319	0.772			
DES_FUNCNEED	0.323	0.783			
DES_COMFORT	0.296	0.716			
AESTHETIC			0.704	0.819	0.531
DES_MYSTYLE	0.367	0.780			
DES_NICESEE	0.315	0.668			
DES_HEDONEED	0.348	0.738			
DES_CREATIVE	0.341	0.724			
SYMBOLIC			0.545	0.815	0.687
DES_SOCSTATUS	0.603	0.829			
DES_UNUSUAL	0.603	0.829			
CEC	1.000	1.000	1.000	1.000	1.000
PI	1.000	1.000	1.000	1.000	1.000

Source: personal elaboration.

The individual inner model analysis algorithm has been set as linear, given the violation of the assumption of normality of data (Kock, 2017). Its evaluation was helpful for addressing both RQ4 and RQ5, and the related hypotheses. The path coefficients were considered significant with a t-value greater than 1.96 (in absolute value) and a p-value not exceeding 0.05.

Table 6.9 – Structural model estimation

Path	Beta	t-value	p-value	Result
H1: DES > PI H1.1: SYMBOLIC > PI				H1: Partially supported H1.1: Supported
FUNCTIONAL > PI	0.04	0.791	0.215	
AESTHETIC > PI	**0.10**	2.803	**0.036**	
SYMBOLIC > PI	**0.27**	5.381	**<0.001**	
H2: CEC > PI				Not Supported
CEC > PI	-0.06	-1.207	0.11	
H3: DESCEC > PI				Partially supported
FUNCCEC > PI	**-0.13**	**-2.545**	**0.006**	
AESTCEC > PI	-0.01	-0.265	0.396	
SYMBCEC > PI	-0.07	-1.388	0.083	

Source: personal elaboration.

Results highlighted that both the aesthetic (β=0.10, p<0.05) and the symbolic dimensions (β=0.27, p<0.05) of design have a positive influence on the consumer's purchasing intention of design furniture objects. This supports hypothesis H1.1, while hypothesis H1 is not fully confirmed because the relationship between FUNCTIONAL and PI is not statistically significant. Compared to the regression analysis, the SEM procedure underlined the role of the aesthetic dimension together with that of the symbolic one, thus strengthening the importance of intangible features of design in the process of developing positive purchasing intention of furniture product.

The degree of attention of consumers towards environmental issues (CEC) does not affect the purchasing intention (p>0.05). Hence, hypothesis H.2 is not supported by our data. However, CEC acts as a moderator on the relationship between the functional dimension of design and purchasing intention (β=-0.13, p<0.05). The negative sign of the Beta-value suggests that the higher the attentions towards environmental problems is, the lower the consumers' purchasing intention is affected by the functional attributes of design, concerning the ease of use of a product, its durability, and other related qualities. Similar considerations cannot be extended to the relationships between AESTHETIC and PI and SYMBOLIC and PI, as the moderator effect of CEC disappears.

Despite the hypothesis H3 is partially supported, the findings of the SEM analysis reinforce previous results obtained from the regression analysis carried out after the Kruskal-Wallis test,

meaning that, when consumers are highly involved with environmental concerns, they tend to be less influenced by the functional dimension of design.

As introduced earlier, this is in line with the definition of design proposed by Arboleda and Alonso (2014), as well as other scholars (e.g., Boztepe, 2007; Chitturi, 2009), who considered the environmental impact of the product as a variable that does not strictly concern the dimension of functionality, while falling within the symbolic dimension. Indeed, functionality refers to the product itself (what it is used for, how it is made, the materials used, etc.), while the symbolic component refers to the relationship between product and the individual in the context. Gender is not statistically significant in affecting purchasing intention ($p>0.05$).

Figure 6.3 depicts the research model emerging from the SEM analysis with the significant values.

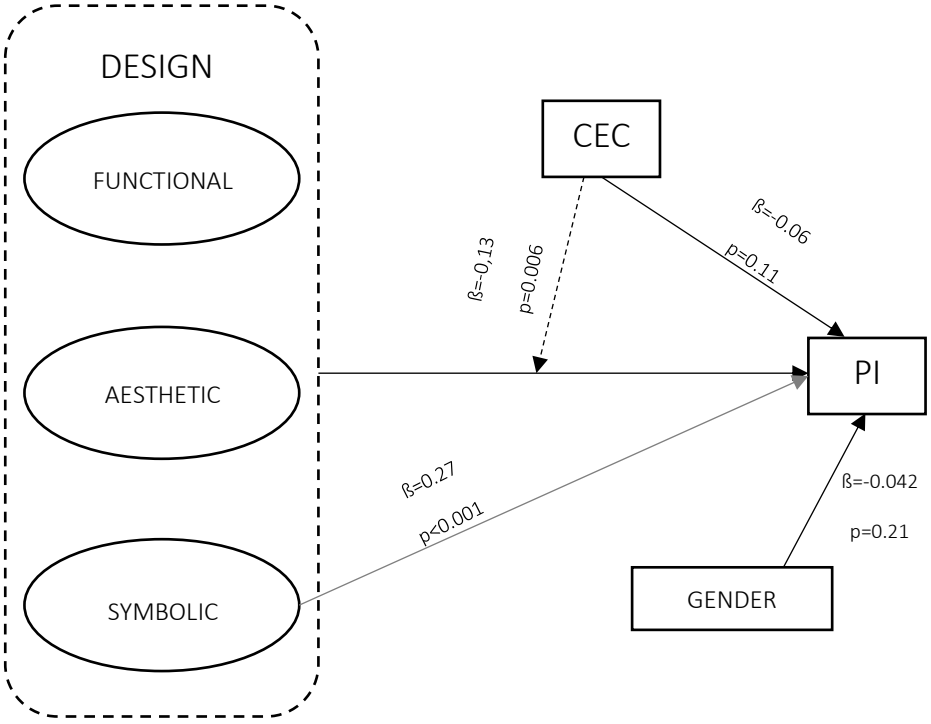

Figure 6.3 - Research model (with significant values)
Source: personal elaboration.

Concluding, these findings provide evidence of the above interpretation, by confirming that, when consumers are not highly environmentally concerned, they are less attracted by the symbolic and aesthetic dimension of design, of which environmental concern can be considered to be a part.

Several theoretical and practical implications emerge from the above results.

6.5 DISCUSSION AND IMPLICATIONS

From a theoretical standpoint, this study contributes to the literature on design management by adding new insights related to the specific context of the furniture industry, where design plays a critical role for companies' competitiveness and survival (Dell'Era et al., 2017).

Firstly, the research findings enable to identify the different dimensions of design that affect consumers' perception in the furniture sector, where few to no contributions have been found until now. In particular, the empirical results confirmed that the concept of design can be intended as a three-dimensional construct, based on functional, aesthetic, and symbolic attributes, thus supporting previous findings of Homburg and colleagues (2015). This classification of design attributes enriches the scarce debate on the use of this kind of conceptualisation in specific sectors, as in the case of the furniture one (Homburg et al., 2015). Notably, each component could be perceived by consumers in different ways, as pointed out by Creusen and Schoormans (2005, p. 67), who stated that "someone who likes a colourful design [aesthetic dimension] may not buy it because it looks 'too childish' [symbolic dimension]". Overall, the present study suggests that consumers' perception of design is mostly influenced by the functional and aesthetic attributes of a furniture product (RQ3). These, indeed, are the most evident features as they refer to technical and visual characteristics of an object and contribute to shaping consumers' perception through their daily experiences with the object itself.

A second contribution concerns the comprehension of the effects resulting from the different perception of design on consumers' purchasing intention, through an explicit analysis of its different constitutive dimensions (RQ4). The results demonstrated that the perception of design attributes actively influences consumers' purchasing intention, especially in terms of aesthetics and symbolism. This is in line with prior studies (da Silveira, 2011; Schreier et al., 2012) which highlighted that consumers are able to understand and base their decision-making processes on the presence of design features. Notably, in this study, the symbolic dimension of design proved to be the most important one, from a statistical point of view. It refers to the meanings that consumers attribute to the product itself and, similarly, to the values that they want to communicate to others. This result is also consistent with prior literature (Bumgardner and Bowe, 2007; Lindberg et al., 2013; Homburg et al., 2015) which stressed the importance of the symbolic dimension for purchasing intention, also in the furniture market, where

consumers are more keen to buy furniture products that enable them to better express their self-identities and emotional meanings.

Lastly, the results of this study enable to deepen the relationship between design and purchasing intention, by introducing the effects of consumers' environmental concern, on which very few studies concerning the furniture setting have been found until now. It emerged that environmental concern does not significantly affect the purchasing intention of design furniture products, thus not supporting prior studies that proved the existence of both positive (e.g., Newton et al., 2015; Heo and Muralidharan, 2019) and negative (e.g., Beverland, 2011) relationships between customers' environmental concerns and purchasing intention. Overall, the results highlighted the scarce attention towards environmental issues paid by consumers when considering the design attributes. This can be explained by the fact that consumers' perception of design is mainly affected by the functional and the aesthetic features of a product, and not by the symbolic ones, of which environmental aspects can be considered to be part of (Boztepe, 2007; Chitturi, 2009; Arboleda and Alonso, 2014). In addition, individual environmental concern moderates the relationship between the functional dimension of design and purchasing intention. More specifically, it can be said that when consumers are highly concerned about environmental issues, they tend to be less influenced by the functional dimension of design, while the contrary occurs when the individual interest towards environmental issues decreases. In a more general way, these results provide a consistent contribution to addressing the RQ4 and RQ5 of this study by pointing out a moderate relevance of the consumers' environmental concern in affecting their purchasing intention.

The above results not only enrich the extant research on design management by suggesting new insights concerning the specific context of the furniture industry, as they also provide managers and practitioners with interesting practical implications. In this regard, the outcomes are noteworthy at least in two respects.

Firstly, furniture companies should consider all the three constitutive dimensions of design in defining their strategies, albeit with some distinctions. As previously discussed, consumers' perception is mostly influenced by the functional and aesthetic dimensions of design, while their purchasing intention is more influenced by the symbolic one. Therefore, this requires more efforts by companies in distinguishing and evaluating the different moments of the customer journey, in order to be more effective in the strategic use of design. More specifically, furniture companies should primarily focus on both the functional and the aesthetic

dimensions of design to adequately convey the overall design of a product to consumers (i.e. on the perceptual level), while enhancing the symbolic component during the purchase phase to trigger the consumers' willingness to buy a specific product (i.e. on the behavioural level). Different products and communication strategies could be reasonably implemented to this end. As far as the product strategy, high attention must be paid to all attributes of the design. Companies' value propositions should be focused on the products perceived by consumers as durable, easy to use, comfortable, nice to see, and able to satisfy both functional and hedonistic needs. At the same time, such products should enable the individual to express his/her own self-identity. All these attributes can be adequately designed only after a careful analysis of the demand, aimed at understanding: (i) what are the real needs and expectations of consumers, who are guided by their values when purchasing a furniture item, (ii) what are their main criteria of evaluation and use, and (iii) what are the most effective attributes in producing different responses by consumers. In other words, the design of a product must be adequately reasoned and positioned in the market with the aim to facilitate the perception of the product itself with its own specific identity and differentiating attributes.

All the above discussed efforts must be accompanied by an effective communication strategy that should be managed according to the different steps of the customer journey. Notably, in order to influence the perception processes, the focus of the communication strategy should be placed on the functional and aesthetic aspects of the product, while enhancing some specific attributes such as functionality, durability, and aesthetic appearance. Meanwhile, for developing a real buying intention in consumers' mind, the messages conveyed should be more emotional, by leveraging the uniqueness of the product and its ability to identify and incorporating the values that consumers appreciate. In this regard, innovative tools and policies could facilitate companies in conveying such emotional messages. For instance, furniture companies could work on a more strategic design of the store atmosphere within their point of sales. They could also adopt a more direct communication, by organizing events to which consumers are invited to see and try the design products. Social tools could also play an important role in this respect, as they enable companies to develop a more direct and trustful relationship with consumers.

These considerations also suggest the need for effective internal training and communication programmes between specific departments within companies, especially those operating in the technical, R&D and marketing fields, whose activities are primarily aimed at the product

development. These efforts should be consistently managed so that the different skills can be valued and incorporated into product design, in a way that prevents the neglect of any of the design dimensions. As pointed out by Noble and Kumar (2010), the design team should manipulate product attributes with the aim to meet design goals, which, in turn, can range from shaping consumers' perceptions to triggering new needs and expectations. In this regard, an adequate organisational environment based on teamwork and the combination of different skills becomes critical. More specifically, the marketing department can play an important strategic role in facilitating functional coordination, knowledge sharing and ensure that design management is always focused on satisfying the actual needs and desires of consumers.

A second suggestion concerns the consumers' involvement with environmental issues and its impact on design perception and purchasing intention. Results revealed that environmental concerns do not affect buying intention directly. However, they impact on perceptive processes, thus leading consumers to put more attention on the functional dimension of design when they are not very sensitive towards environmental issues. Moreover, the higher the attention towards environmental problems is, the lower is the influence of functional attributes on purchasing intention, thus suggesting the existence of a moderating effect of environmental concerns. Based on these reasonings, companies should consider the role of environmental concern in consumers' mind in defining their overall strategies. When companies decide to promote their offers among consumers that are scarcely involved with environmental issues, they should focus mainly on functional attributes of design, while the contrary should occur when consumers are highly environmentally concerned. In this case, the symbolic dimension, of which environmental aspects are considered to be a part, could play a crucial role. As previously discussed in this section, practical implications could be derived both in terms of production and communication strategies. These require a careful segmentation of the market and the implementation of an effective product/brand positioning.

A further consideration can be drawn in terms of the environmental practices that companies could adopt. By focusing on the symbolic attributes of design with the aim of addressing environmentally concerned consumers, companies can gain some interesting benefits, since the symbolic attributes have a positive and direct effect on purchasing intention. Thus, furniture companies should intercept the consumers' needs and expectations of those targets which are more sensitive to environmental protection. To this end, they could enhance their

environmental policies to improve the overall sustainability of both their products and company image.

Furniture companies could improve their efforts aimed at reducing the use of raw materials and energy, by recycling wastes and reusing end-of-life cycle products. These activities, which embody the basic principles of circular economy, could facilitate the adoption of eco-design practices, with several advantages in terms of economic, financial, and social benefits. Indeed, by combining design and environmental aspects, eco-design is more likely to attract consumers who are highly environmentally involved, and to stimulate a behavioural response in terms of purchasing intention (Lin et al., 2013; Magnier and Crié, 2015). On a practical level, companies should also improve their attention towards product certifications. To this end, a specific question in this study was formulated to evaluate the consumers' purchasing intention of certified design furniture products. Data revealed that respondents expressed a growing willingness to: (i) buy certified design-based products rather than similar, non-certified ones (*Mean value* = 5.08; *Standard Deviation* = 1.443; *Variance* = 2.082); (ii) recommend to others to buy certified design-based products (*Mean value* = 5.35; *Standard Deviation* = 1.485; *Variance* = 2.207); (iii) buy certified design-based products in their future (*Mean value* = 5.43; *Standard Deviation* = 1.460; *Variance* = 2.131). Here lies the crucial role of the companies' communication strategies along with the different tools they can use, such as environmental certifications displayed on their products and/or in their point-of-sale, brochures, websites, and other media.

6.6. CONCLUSIONS, LIMITATIONS AND FUTURE RESEACH DIRECTIONS

The above-discussed considerations highlight the appropriateness of the three-dimensional conceptualisation of the design concept in the furniture industry and suggest implications from both a theoretical and an empirical perspective. In particular, by considering the increasing attention of both companies and consumers towards environmental issues, this study provides interesting findings on its effects on the relationship between consumers' design perception and their actual purchasing behaviours in the specific context of the furniture industry. It emerges that consumers perceive the design attributes of a product to different extents in accordance with their personal concern with environmental issues and this, in turn, results in different purchasing behaviours.

Certainly, this study presents some limitations and several challenges regarding both theory building and methodology that are hoped to be successfully overcome by future research. A first limitation can be identified in the nature of the data. These were collected through self-administered questionnaires, which allowed limited possibilities in order to have a more subjective expression of the respondents' opinions. Therefore, the use of other qualitative methodologies, such as semi-structured interviews, focus group, and participant observation, would enable researchers to overcome this limit. A second limitation lies in the composition of the sample. As previously discussed in Section 6.3.2, the study was conducted on a sample of Italian people, mainly composed of young people. This should not be considered as a limitation in a technical sense, but a comparison between different cultures and generations would provide further interesting results. Hence, future research could be extended to a wider sample, both in terms of size and composition, in order to increase statistical representativeness. Furthermore, even if some concerns about the use of a single-item scale due to their low construct validity, reliability, and sensibility have been raised, several authors (McKenzie and Marks, 1999; Wanous and Hudy, 2001; Bergkvist and Rossiter, 2007) have used them as reasonable substitutes for multi-item scale, also within the environmental sociology field (Givens and Jorgenson 2011; Jorgenson and Givens 2014). In this regard, future studies could be developed using multi-item scales.

Given the pervasiveness of the design concept - ranging from product design to environmental design, just to give a few examples - new conceptualisations of its perception along with more extensive literature reviews on this topic, could be further investigated. Future research might also explore different predictive models which involve the analysis of other moderating and/or mediating variables, such as store atmosphere, the design of a company's website, and the consumers' attitude towards online purchase of design furniture products.

Finally, the comparison of different perspectives (e.g., consumers and retailers' perspectives) and of other similar and/or related industries could provide additional interesting theoretical findings as well as useful practical suggestions.

CHAPTER 7

AN OVERALL DISCUSSION OF RESULTS:

conclusions, limitations and future research directions

7.1 DISCUSSION OF THE RESEARCH PHASES

The mixed-method approach (i.e. qualitative and quantitative research) adopted in this study improved the possibility to achieve a deeper understanding of the extent to which design can be used as a strategic tool to enhance and sustain furniture companies' competitiveness and innovative performances. The analysis of both companies and consumers' perspectives revealed its usefulness in accomplishing this overall aim.

In the first qualitative study, the role of design has been analysed through the lens of the circular economy paradigm, as it allows to consider a broader connotation of the concept, which includes different aspects (i.e. functional, aesthetic, and environmental dimensions). The results of the multiple case-studies revealed a significant awareness of furniture companies about the concept of the circular economy and eco-design practices, as well as about the opportunities related to the adoption of quality management tools (i.e. product and process certifications). Nevertheless, the companies analysed are still little involved in circular practices, especially concerning reuse and recycling activities. Moreover, a very limited use of environmental certifications emerged from this study, thus revealing a potential gap between their positive attitude towards circularity and its current implementation.

These empirical findings are somewhat in contrast with previous studies (Brennan et al., 2015; Ghisellini et al., 2016; Murray et al., 2017), which highlighted a growing number of companies moving towards the adoption of circular business models. Additionally, these findings revealed an underestimation of the potential benefits resulting from the implementation of circular practices and quality management tools for both product and process innovation. Given the fundamental role of innovation in supporting companies' survival and competitiveness (Brem et al., 2016; Ferreira et al., 2017), this was a rather surprising result.

Overall, even if these findings suggested a limited understanding of the potential benefits related to the adoption of environmental practices, the behavioural gap that emerged in this

phase contributed to enriching the incipient debate on circular economy within the specific context of furniture companies, on which extant literature seems to be rather lacking (de Carvalho Araújo et al., 2019).

Based on the above findings, the second qualitative study provided empirical evidence of the effectiveness of circular and sustainable practices, especially eco-design ones, for developing innovative design furniture objects. As pointed out by Dai and colleagues (2015), the growing awareness about environmental issues could affect the way companies and consumers interact with each other worldwide, thus highlighting the need to integrate both the aesthetic and functional features of a product - as tools for differentiation and competitiveness – with sustainable ones (Hertenstein et al., 2013). The company analysed in this study offered the "rare and extreme" qualities needed to observe the above phenomena (Eisenhardt and Graebner, 2007). Indeed, it proved the effectiveness of the integration of eco-design practices into the value-chain since the early stages of new product development, as demonstrated by the DV Glass® project. In particular, the findings of this study added further knowledge as they provided evidence about: (i) how product innovation is carried out in a context of family firms, while prior research mainly analysed the antecedents and outcomes of the innovation process (De Massis et al., 2013; Calabrò et al., 2019), and (ii) the importance of adopting an open innovation approach, instead of a closed innovation approach usually adopted by these companies (Popa et al., 2017). Overall, the analysis of the single case-study demonstrated the existence of a positive relationship between innovation, circular economy, and eco-design within SMEs, on which extant results are still contradictory and controversial (De Massis et al., 2013; de Jesus Pacheco et al., 2017).

The results obtained from the qualitative study provided useful suggestions for developing the second step of the research, focused con the consumers' perspective. More specifically, the analysis of the DV Glass® project suggested that its introduction has enabled the company to address more sophisticated consumers' needs, both in terms of design and environmental sustainability. However, enhancing the acceptance of new product in the market and supporting companies' investments and efforts required also an adequate level of consumers' awareness about environmental issues. Therefore, the consumers' perspective emerged as critical to analyse.

Several results emerged from this step: (i) the design attributes of a furniture product can be grouped into three dimensions (i.e. functional, aesthetic, symbolic), in line with the general

categorisation provided by Homburg and colleagues (2015); moreover, consumers' perception was mainly influenced by the functional and aesthetic features of a product, thus supporting prior studies (da Silveira, 2011; Schreier et al., 2012; Lindberg et al., 2013); (ii) contrary to expectations, only the intangible features of design (i.e. aesthetic and symbolic attributes) significantly affect the consumers' purchasing intention, thus leading to the conclusion that an attitude-behavioural gap among consumers exists; (iii) the degree of awareness of consumers about environmental issues did not significantly influence their purchasing intention, contrary to prior studies which highlighted the existence of both positive (Newton et al., 2015; Heo and Muralidharan, 2019) and negative (Beverland, 2011) relationships. However, consumers' concerns towards environmental issues negatively influence the relationship between the functional dimension of design and their purchasing intention. In other words, it can be said that, when consumers exhibit a high involvement in environmental issues, the extent of the functional dimension of design decreases. These findings can be supported by prior research (Boztepe, 2007; Chitturi, 2009; Arboleda and Alonso, 2014), which included the environmental impact of the product in the symbolic dimension of design rather than in the functional one.

As a final point, the analysis of the two perspectives (i.e. consumers and companies' ones) and of the existing relationships between design, innovation, and circular economy proved the effectiveness of a broader connotation of design including also environmental aspects, as a powerful force in generating and nurturing competitive advantage in the current and the future economic scenario.

7.2 IMPLICATIONS FOR MANAGEMENT

The findings of this study showed that companies' competitive and innovative performances can be further improved through a strategic use of design, based on the adoption of circular business practices. Although these investments still tend to be considered by companies as risky activities, probably because of the current economic and social uncertainties, they proved their effectiveness in terms of both innovation and fulfilment of consumers' expectations. Moreover, their profitable exploitation needs some requirements that concern three different levels, i.e. the company, the customers and the Institutions.

At the company's level, a change in the top management culture is highly recommended in order to overcome the scarce involvement of furniture companies in the adoption of circular and eco-design practices. Certainly, the creation of a corporate culture based on sustainable

and circular principles requires several efforts by companies. Therefore, it is reasonable to suppose that a radical transformation of the corporate culture does not concern only the top management, as it also involves the whole organisation. Here lies the critical role of internal communication within companies, based on regular meetings, periodic reports, as well as the use of proper indicators, which can help to summarise the circular economy benefits and to operationalise its results. In this regard, internal communication could become a fundamental tool aimed at informing the personnel about the opportunities related to circular economy and its economic, environmental, and social advantages, thus promoting the transition towards new sustainable business models.

Companies should also engage in organisational changes. Notably, this study underlined the importance of adopting a lean and flat organisational structure in order to promote sustainable innovation processes and to improve their ability to implement both a reverse logistic and an efficient system of waste and product leftovers treatment. These, in turn, can be particularly helpful for companies engaging in circular and sustainable practices as they facilitate the return of used materials and products to the market.

A further implication pertains to the critical role of marketing and other companies' departments closely interacting with customers. The study suggests the opportunity to improve their overall responsibilities in order to provide a better understanding of each step of the customer journey, which is critical for improving the effectiveness of communication strategies and to ensure that customers' needs are identified and addressed with effective new products.

Finally, at an operational level, it would be desirable for furniture companies to be more involved in the collaborations with those designers who demonstrate a particular interest towards environmental issues. This could enhance the implementation of eco-design practices, as environmental issues could be directly addressed since the early stages of products' development (e.g., by introducing sustainable or recycled raw materials in manufacturing processes). Additionally, both actors involved in this relationship could obtain economic and social benefits. If on one hand, young designers who have a greater understanding of contemporary society's needs can experience new opportunities for their professional growth, on the other side companies could gain benefits in terms of reputation, as they demonstrate their environmental and social commitment.

The above implications concerning companies' strategies and organisational structures should be combined with specific efforts targeted at the consumer's level.

The study suggests the importance of investing in effective trainings to customers with the aim to raise awareness and deepen their knowledge concerning environmental issues. To this end, companies could engage and promote different initiatives, including an updating of their online channels – by sharing contents related to sustainable issues – and the organisation of events and workshops – both within the companies and through their sales channels. In this sense, companies could be considered responsible for their impact on society's well-being and, at the same time, they could actively contribute to create sustainable development models. Therefore, acting in a sustainable way cannot be merely intended as "avoiding doing something negative" (e.g., polluting less, producing less waste, etc.) but actively promoting the development of the context in which companies operate.

In this regard, the present study also suggests the importance of managing effective market communications, by improving both the use of social media platforms and personal initiatives developed through the retail system. These, in turn, could be particularly effective in the success of the innovation in the market and for promoting the adoption of new consumption models where property is replaced by access. Companies should, therefore, raise awareness among individuals with a consumer-owner mindset, with the aim to convert them into consumers-users characterised by a growing awareness of the fact that, after its use, the product could be returned to be reused or recycled.

Certainly, the above internal and external efforts require a lot of financial and organisational resources, since greater investments could be needed for processing reused materials and waste disposal, developing new skills, applying organizational changes, as well as for organizing events and communication activities targeted to the market. Thus, the third level of practical implications emerges from Governments and public institutions.

The companies analysed in this study pointed out the need for financial supports from Governments, aimed at facilitating their investments in design and circular economy practices. Moreover, through these initiatives companies would be able to expand their overall knowledge about these topics. For example, a greater expertise in environmental legislation could help companies to redesign their business objectives and the most appropriate strategies to achieve them. Additionally, the network of connections that would arise from these initiatives could result in additional support for the implementation of such practices, for instance through economic and fiscal incentives, or technical advice provided by qualified subjects.

Concluding, the role of Government and public Institutions could be critical also to the support of the implementation of reverse logistic systems and to the adoption of environmental certifications within companies, which are essential for operationalising their attitude towards circularity, as well as for communicating their commitment towards environmental and sustainable issues.

7.3 LIMITATIONS OF THE STUDY AND FUTURE RESEARCH DIRECTIONS

Notwithstanding the theoretical and practical contributions of this study, there are some methodological limitations that open the possibility for future research (see Figure 7.1).

The first limitation concerns the restricted number of companies selected for the qualitative study: only few companies, located in Northern and Central Italy, were deeply investigated. Therefore, expanding the sample by including companies located in different areas of Italy, as well as in other foreign Countries, might be helpful to identify differences and similarities concerning the extent to which circular and eco-design practices are implemented, along with the main motivations and factors underlying the adoption of circular business approaches within companies.

Moreover, the sample of respondents used for the quantitative study was composed of Italian people, thus strengthening the overall focus of this research on the Italian context. Future research might consider a wider context of analysis to allow the development of comparative studies and to obtain a broader generalisation of the results.

As a further limitation, the first step of this research focused on the development and manufacturing processes for the realisation of furniture products. However, as earlier discussed in this thesis, sustainable and circular economy principles can be implemented along the whole value chain of companies (Marques et al., 2017; Kumar et al., 2019). Hence, future studies might investigate whether and how such principles are implemented in other processes within furniture companies, such as supply, logistics, and sales. With specific regard to these latter, future studies could usefully investigate the fundamental role of sales staff in conveying the commitment of the company in environmental issues, as well as in enhancing a better understanding of the most relevant factors affecting consumers' decision-making and buying processes.

Finally, since the implementation of circular business models is still at an exploratory stage, due to the lack of common and accepted frameworks that enable companies to successfully

implement these practices (MacArthur, 2013; Lieder and Rashid, 2016) - especially in the furniture sector - future studies are needed to fuel the debate and to add further knowledge on how circular economy principles and related practices could be successfully implemented within this sector as well as in related ones.

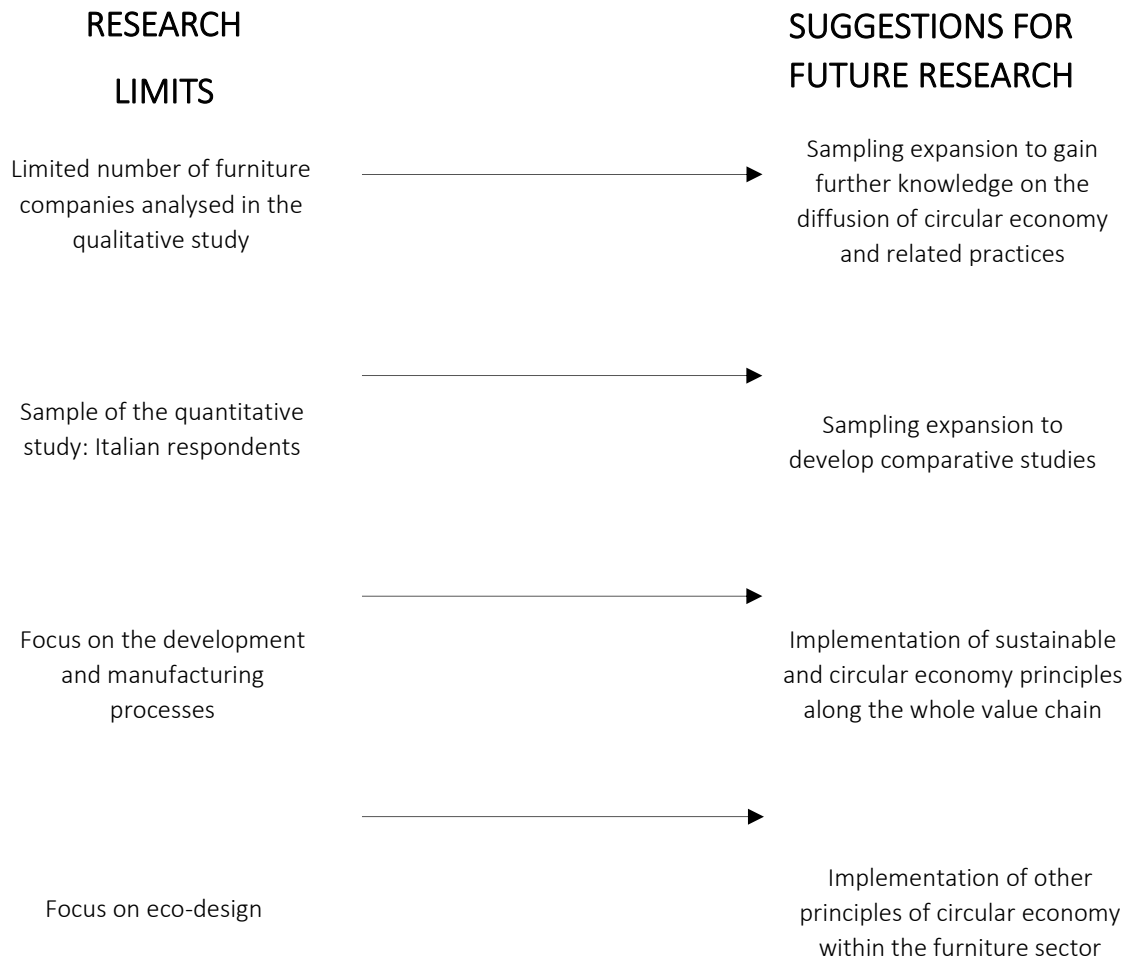

Figure7.1 - Suggestions for future research

Source: personal elaboration.

REFERENCES

Abdullah, S., Razak, A. A., Hanafi, M. H., Abu Bakar, A. H. (2012). Organizational behavior barriers in implementing ISO 9000 within the Malaysian local governments. *Elixir Social Science*, *52*(1), 11287-11296.

Abecassis-Moedas, C., Rodrigues Pereira, J. (2016). External design for reputation, perspective and exposure. *Creativity and Innovation Management*, *25*(3), 396-407.

Abiad, A., Furceri, D., Topalova, P. (2016). The macroeconomic effects of public investment: Evidence from advanced economies. *Journal of Macroeconomics*, *50*, 224-240.

Acar, O. A., Puntoni, S. (2016). Customer empowerment in the digital age. *Journal of Advertising Research*, *56*(1), 4-8.

Addis, W., Schouten, J. (2004). *Design for reconstruction: principles of design to facilitate reuse and recycling.* Construction Industry Research & Information Association (*CIRIA*).

Adebanjo, D., Teh, P. L., Ahmed, P. K. (2016). The impact of external pressure and sustainable management practices on manufacturing performance and environmental outcomes. *International Journal of Operations & Production Management, 36* (9), *995-1013*.

Aghion, P. (2018). Innovation and growth from a schumpeterian perspective. *Revue d'économie politique*, *128*(5), 693-711.

Aghion, P., Bloom, N., Blundell, R., Griffith, R., Howitt, P. (2005). Competition and innovation: An inverted-U relationship. *The quarterly journal of economics*, *120*(2), 701-728.

Aghion, P., Bechtold, S., Cassar, L., Herz, H. (2018). The causal effects of competition on innovation: Experimental evidence. *The Journal of Law, Economics, and Organization*, *34*(2), 162-195.

Ahmad, S., Wong, K. Y., Tseng, M. L., Wong, W. P. (2018). Sustainable product design and development: A review of tools, applications and research prospects. *Resources, Conservation and Recycling*, *132*, 49-61.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, *50*(2), 179-211.

Alalwan, A. A. (2018). Investigating the impact of social media advertising features on customer purchase intention. *International Journal of Information Management*, *42*, 65-77.

Almeida, C. M. V. B., Agostinho, F., Giannetti, B. F., Huisingh, D. (2015). Integrating cleaner production into sustainability strategies: an introduction to this special volume. *Journal of Cleaner Production*, *96*, 1-9.

Alonso, L. E., Rodríguez, C. J. F., Rojo, R. I. (2015). From consumerism to guilt: Economic crisis and discourses about consumption in Spain. *Journal of Consumer Culture*, *15*(1), 66-85.

Amara, N., Landry, R., Becheikh, N., Ouimet, M. (2008). Learning and novelty of innovation in established manufacturing SMEs. *Technovation*, *28*(7), 450-463.

Andrade, D. M., de Lima, J. B., Antonialli, L. M. de Muylder, C. F. (2011). The family social capital impact in practices of learning, change and innovation in entrepreneurial family businesses. *African Journal of Business Management, 5*(33), 12819-12828.

Andreu, L., Sánchez, I., Mele, C. (2010). Value co-creation among retailers and consumers: New insights into the furniture market. *Journal of retailing and consumer services*, *17*(4), 241-250.

Antonioli, D., Marzucchi, A., Montresor, S. (2014). Regional innovation policy and innovative behaviour: looking for additional effects. *European Planning Studies*, *22*(1), 64-83.

Antwi, S. K., Hamza, K. (2015). Qualitative and quantitative research paradigms in business research: A philosophical reflection. *European journal of business and management*, *7*(3), 217-225.

Arboleda, A. M., Alonso, J. C. (2014). Design awareness and purchase intention: an item response theory approach. *Academia Revista Latinoamericana de Administración, 27*(1), 138-155.

Arrow, K. J. (1972). Economic welfare and the allocation of resources for invention. In R. Nelson (Ed.), *The rate and direction of inventive activity*. Princeton University Press: Princeton, NJ.

Atrees, F. F. (2015). The concept of subliminal messages in Brand design. *International Design Journal*, *5*(1), 23-28.

Azizi, M., Mohebbi, N., De Felice, F. (2016). Evaluation of sustainable development of wooden furniture industry using multi criteria decision making method. *Agriculture and agricultural science procedia*, *8*, 387-394.

Barbaritano, M., Bravi, L., Savelli, E. (2019). Sustainability and quality management in the Italian luxury furniture sector: A circular economy perspective. *Sustainability*, *11*(11), 3089.

Barbaritano, M., Savelli, E. (2020). Design and sustainability for innovation in family firms. A case study from the italian furniture sector. *Piccola Impresa/Small Business*, (1), 45-68.

Barbaritano, M., & Savelli, E. (2020). "How environmental concerns affect the relationship between design attributes and purchasing intention". XVII Convegno Annuale della Società Italiana Marketing, *Il Marketing per una società migliore*, October 28-30th, 2020.

Barratt, M., Choi, T. Y., Li, M. (2011). Qualitative case studies in operations management: Trends, research outcomes, and future research implications. *Journal of Operations Management*, *29*(4), 329-342.

Basha, M. B., Mason, C., Shamsudin, M. F., Hussain, H. I., Salem, M. A. (2015). Consumers attitude towards organic food. *Procedia Economics and Finance*, *31*, 444-452.

Battistella, C., De Toni, A. F., Pillon, R. (2015). The Extended Map methodology: Technology roadmapping for SMES clusters. *Journal of Engineering and Technology Management*, *38*, 1-23.

Baumgartner, R. J., Ebner, D. (2010). Corporate sustainability strategies: sustainability profiles and maturity levels. *Sustainable Development*, *18*(2), 76-89.

Bayraktar, C. A., Hancerliogullari, G., Cetinguc, B., Calisir, F. (2017). Competitive strategies, innovation, and firm performance: an empirical study in a developing economy environment. *Technology Analysis & Strategic Management*, *29*(1), 38-52.

Beer, J.; Le Coq, J.F.; Soto, G.; González Hernández, C.; Rapidel, B.; DeCleerck, F. (2011). PES and Eco-Label: a comparative analysis of their limits and opportunities to foster environmental services provision. In Le Coq, J.F., Rapidel, B., *Ecosystem services from agriculture and agroforestry: measurement and payment* (1st ed., pp. 271-298). Routledge: London.

Belk, R. W. (1988). Possessions and the extended self. *Journal of consumer research*, *15*(2), 139-168.

Beneito, P., Rochina-Barrachina, M. E., Sanchis, A. (2017). Competition and innovation with selective exit: an inverted-U shape relationship?. *Oxford Economic Papers*, *69*(4), 1032-1053.

Bergkvist, L., Rossiter, J. R. (2007). The predictive validity of multiple-item versus single-item measures of the same constructs. *Journal of marketing research*, *44*(2), 175-184.

Beverland, M. B. (2011). Slow design. *Design Management Review*, *22*(1), 34-42.

Bhamra, T., Lofthouse, V. (2016). *Design for sustainability: a practical approach*. Routledge.

Bigliardi, B. (2013). The effect of innovation on financial performance: A research study involving SMEs. *Innovation*, *15*(2), 245-255.

Birat, J. P. (2015). Life-cycle assessment, resource efficiency and recycling. *Metallurgical Research & Technology*, *112*(2), 206.

Bloch, P. H. (2011). Product design and marketing: Reflections after fifteen years. *Journal of Product Innovation Management*, *28*(3), 378-380.

Blumer, H., (1969). *Symbolic Interactionism. Perspective and Method*. Englewood Cliffs: Prentice Hall.

Boccia Artieri, G., (2012). Generazioni mediali, cultura pop e pratiche riflessive. Prospettive delle generazioni X e Y in Italia. In Colombo, F., Boccia Artieri, G., Del Grosso Destreri, L., Pasquali, F., Sorice, M., *Media e generazioni nella società italiana*. Milano: FrancoAngeli.

Bocken, N. M., De Pauw, I., Bakker, C., van der Grinten, B. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*, *33*(5), 308-320.

Bocken, N. M., Short, S. W., Rana, P., Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, *65*, 42-56.

Böcker, L., Meelen, T. (2017). Sharing for people, planet or profit? Analysing motivations for intended sharing economy participation. *Environmental Innovation and Societal Transitions*, *23*, 28-39.

Bonoma, T. V. (1985). Case research in marketing: opportunities, problems, and a process. *Journal of marketing research*, *22*(2), 199-208.

Booth, C. (1903). *Life and Labour of the People in London* (Vol. 1). Macmillan.

Bos-Brouwers, H. E. J. (2010). Corporate sustainability and innovation in SMEs: evidence of themes and activities in practice. *Business strategy and the environment*, *19*(7), 417-435.

Bossle, M. B., de Barcellos, M. D., Vieira, L. M., Sauvée, L. (2016). The drivers for adoption of eco-innovation. *Journal of Cleaner Production*, *113*, 861-872.

Boulding, K. (1966). The Economics of the Coming Spaceship Earth. In H. Jarrett, *Environmental Quality in a Growing Economy* (pp. 3-14). Baltimore, MD: Resources for the Future/Johns Hopkins University Press.

Boutsouki, C. (2019). Impulse behavior in economic crisis: a data driven market segmentation. *International Journal of Retail & Distribution Management, 47*(9), 974-996.

Bovea, M. D., Pérez-Belis, V. (2012). A taxonomy of ecodesign tools for integrating environmental requirements into the product design process. *Journal of Cleaner Production*, *20*(1), 61-71.

Bovea, M. D., Vidal, R. (2004). Materials selection for sustainable product design: a case study of wood based furniture eco-design. *Materials & design*, *25*(2), 111-116.

Bowler, K., Castka, P., Balzarova, M. (2017). Understanding firms' approaches to voluntary certification: Evidence from multiple case studies in FSC certification. *Journal of Business Ethics*, *145*(2), 441-456.

Boztepe, S. (2007). User value: Competing theories and models. *International journal of design*, *1*(2), 55-63.

Braungart, M., McDonough, W., Bollinger, A. (2007). Cradle-to-cradle design: creating healthy emissions–a strategy for eco-effective product and system design. *Journal of Cleaner Production*, *15*(13-14), 1337-1348.

Brem, A., Maier, M., Wimschneider, C. (2016). Competitive advantage through innovation: the case of Nespresso. *European Journal of Innovation Management*, *19*(1), 133-148.

Brennan, G., Tennant, M., Blomsma, F. (2015). Business and production solutions: closing the loop. In. H. Kopnin, E. Shoreman-Ouimed (Eds.), *Sustainability:* Key Issues (pp.219-239). EarthScan/Routledge.

Brodzicki, T. (2019). The intensity of market competition and the innovative performance of firms. *Innovation*, *21*(2), 336-358.

Brown, T. (2008). Design thinking. *Harvard business review*, *86*(6), 84, 1-9.

Bryman, A., Bell, E. (2007). *Business Research Methods* (2nd edition). Oxford University Press.

Bumgardner, M. S., Bowe, S. A. (2007). Species selection in secondary wood products: Implications for product design and promotion. *Wood and Fiber Science*, *34*(3), 408-418.

Bürdek, B. E., López-Manzanares, F. V. (1994). *Diseño: historia, teoría y práctica del diseño industrial*. Barcelona: Gustavo Gili.

Cabanelas, P., Manfredi, L. C., González-Sánchez, J. M., Lampón, J. F. (2019). Multimarket competition and innovation in industrial markets: Spain and Colombia in comparative perspective. *Journal of Business & Industrial Marketing, 35* (3), 457-469.

Cachero-Martínez, S., Vázquez-Casielles, R. (2017). Stimulating curiosity and consumer experience in a retailer. *American Journal of Industrial and Business Management*, *7*(4), 473-486.

Calabrò, A., Vecchiarini, M., Gast, J., Campopiano, G., De Massis, A., Kraus, S. (2019). Innovation in family firms: A systematic literature review and guidance for future research. *International Journal of Management Reviews*, *21*(3), 317-355.

Calvo-Porral, C., Stanton, J. L., Lévy-Mangin, J. P. (2016). Is the economic crisis changing marketing strategies? Evidence from the food industry. *Journal of Global Marketing*, *29*(1), 29-39.

Cantele, S., Zardini, A. (2020). What drives small and medium enterprises towards sustainability? Role of interactions between pressures, barriers, and benefits. *Corporate Social Responsibility and Environmental Management*, *27*(1), 126-136.

Castillo, J. (2017). The relationship between big five personality traits, customer empowerment and customer satisfaction in the retail industry. *Journal of Business and Retail Management Research (JBRMR)*, *11*(2), 11-29.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate behavioral research*, *1*(2), 245-276.

Cesaroni, F. M., Sentuti, A., Buratti, A. (2015). Same crisis, different strategies? Italian men and women entrepreneurs in front of the economic recession. *Journal of Research in Gender Studies*, *5*(2), 205-231.

Ceschin, F., Gaziulusoy, I. (2016). Evolution of design for sustainability: From product design to design for system innovations and transitions. *Design studies*, *47*, 118-163.

Cherubini, S., Eminente, G. (2015). *Marketing in Italia. Per la competitività e la customer experience.* Milano: FrancoAngeli.

Chin, C. L., Chen, Y. J., Kleinman, G., Lee, P. (2009). Corporate ownership structure and innovation: Evidence from Taiwan's electronics industry. *Journal of Accounting, Auditing & Finance*, *24*(1), 145-175.

Chitturi, R. (2009). Emotions by design: A consumer perspective. *International Journal of Design*, *3*(2), 7-17.

Chitturi, R., Raghunathan, R., Mahajan, V. (2008). Delight by design: The role of hedonic versus utilitarian benefits. *Journal of marketing*, *72*(3), 48-63.

Ciocanel, A. B., Pavelescu, F. M. (2015). Innovation and competitiveness in European context. *Procedia Economics and Finance*, *32*(15), 728-737.

Civcisa, G., Grislis, A. (2014). ISO/TS 16949 among Latvian production companies focused on automotive industry. *Agronomy Research*, *12*(1), 255-262.

Coad, A., Grassano, N., Hall, B. H., Moncada-Paternò-Castello, P., Vezzani, A. (2019). Innovation and industrial dynamics. *Structural Change and Economic Dynamics*, *50*, 126-131.

Cohen, E. (2017). *Sustainability Reporting for SMEs: competitive advantage through transparency*. Routledge.

Conti, E., Vesci, M., Crudele, C., Pencarelli, T. (2019). Design-driven innovation, quality, and customer value in manufacturing companies. *The TQM Journal, 31*(6), 968-986.

Cooper, R. G., Kleinschmidt, E. J. (1987). Success factors in product innovation. *Industrial marketing management*, *16*(3), 215-223.

Cooper, R., Hernandez, R., Murphy, E., Tether, B. (2016). Design value: The role of design in innovation. *Lancaster University, Lancaster*.

Corbetta, P., 2014. *Metodologia E Tecniche Della Ricerca Sociale*. Bologna: Il Mulino.

Costa Pinto, D., Herter, M. M., Rossi, P., Borges, A. (2014). Going green for self or for others? Gender and identity salience effects on sustainable consumption. *International Journal of Consumer Studies*, *38*(5), 540-549.

Craig, J., Dibrell, C. (2006). The natural environment, innovation, and firm performance: A comparative study. *Family Business Review*, *19*(4), 275-288.

Crescenzi, R., Luca, D., Milio, S. (2016). The geography of the economic crisis in Europe: national macroeconomic conditions, regional structural factors and short-term economic performance. *Cambridge Journal of Regions, Economy and Society*, *9*(1), 13-32.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W., Miller, D. L. (2010). Determining validity in qualitative inquiry, theory into practice. *Theory into Practice*, *39*(3), 37-41.

Creusen, M. E., Schoormans, J. P. (2005). The different roles of product appearance in consumer choice. *Journal of product innovation management*, *22*(1), 63-81.

Cropley, D. H., Oppert, M. L. (2018). The Fuzzy Front-End? How Creativity Drives Organizational Innovation. In *Individual Creativity in the Workplace* (pp. 35-51). Academic Press.

Cross, N. (2011). *Design thinking: Understanding how designers think and work*. Berg.

Curado, C., Muñoz-Pascual, L., Galende, J. (2018). Antecedents to innovation performance in SMEs: A mixed methods approach. *Journal of Business Research*, *89*, 206-215.

da Silveira, G. J. (2011). Our own translation box: exploring proximity antecedents and performance implications of customer co-design in manufacturing. *International Journal of Production Research*, *49*(13), 3833-3854.

Dai, J., Cantor, D. E., Montabon, F. L. (2015). How environmental management competitive pressure affects a focal firm's environmental innovation activities: a green supply chain perspective. *Journal of Business Logistics*, *36*(3), 242-259.

Daian, G., Ozarska, B. (2009). Wood waste management practices and strategies to increase sustainability standards in the Australian wooden furniture manufacturing sector. *Journal of Cleaner Production*, *17*(17), 1594-1602.

Dalmoro, M., de Matos, C. A., de Barcellos, M. D. (2020). Anticonsumption beyond consumers: The role of small organic producers in environmentally oriented anticonsumption. *Psychology & Marketing, 37(2),* 291-307.

De Carlo, G. (1947). *William Morris* (Vol. 1). Il Balcone.

de Carvalho Araújo, C. K., Salvador, R., Moro Piekarski, C., Sokulski, C. C., de Francisco, A. C., de Carvalho Araújo Camargo, S. K. (2019). Circular Economy Practices on Wood Panels: A Bibliographic Analysis. *Sustainability*, *11*(4), 1057.

De Clercq, D., Belausteguigoitia, I. (2015). Intergenerational strategy involvement and family firms' innovation pursuits: The critical roles of conflict management and social capital. *Journal of Family Business Strategy*, *6*(3), 178-189.

De Fusco, R. (1985). *Storia Del Design*. Roma: Laterza.

De Goey, H., Hilletofth, P., Eriksson, L. (2017). Design-driven innovation: Making meaning for whom?. *The Design Journal*, *20*(sup1), S479-S491.

de Jesus Pacheco, D. A., Carla, S., Jung, C. F., Ribeiro, J. L. D., Navas, H. V. G., Cruz-Machado, V. A. (2017). Eco-innovation determinants in manufacturing SMEs: Systematic review and research directions. *Journal of Cleaner Production*, *142*, 2277-2287.

De Jong, E.; Engelaer, F.; Mendoza, M. (2015). Realizing Opportunities of a Circular Business Model. Available at: http://circulatenews.org/2015/04/de-lage-landen-realising-the-opportunities-of-a-circular-business-model [Accessed: 28/10/2019].

De los Rios, I. C., Charnley, F. J. (2017). Skills and capabilities for a sustainable and circular economy: The changing role of design. *Journal of Cleaner Production*, *160*, 109-122.

De Massis, A., Frattini, F., Lichtenthaler, U. (2013). Research on technological innovation in family firms: Present debates and future directions. *Family Business Review*, *26*(1), 10-31.

De Mattos, C. A., De Albuquerque, T. L. M. (2018). Enabling factors and strategies for the transition toward a circular economy (CE). *Sustainability*, *10*(12), 4628.

Dell'Era, C., Altuna, N., Magistretti, S., Verganti, R. (2017). Discovering quiescent meanings in technologies: Exploring the design management practices that support the development of technology epiphanies. *Technology Analysis & Strategic Management*, *29*(2), 149-166.

Dell'Era, C., Verganti, R. (2010). Collaborative strategies in design-intensive industries: knowledge diversity and innovation. *Long range planning*, *43*(1), 123-141.

Demirel, P., Danisman, G. O. (2019). Eco-innovation and firm growth in the circular economy: Evidence from European small-and medium-sized enterprises. *Business Strategy and the Environment*, *28*(8), 1608-1618.

Demyanyk, Y., Loutskina, E., Murphy, D. (2019). Fiscal Stimulus and Consumer Debt. *Review of Economics and Statistics*, *101*(4), 728-741.

Denzin, N.K., Lincoln, Y.S., (1994). *Handbook of Qualitative Research*, 2nd ed.. Thousand Oaks: Sage.

Dereli, D. D. (2015). Innovation management in global competition and competitive advantage. *Procedia-Social and behavioral sciences*, *195*, 1365-1370.

Deserti, A., Rizzo, F. (2014). Design and the Cultures of Enterprises. *Design Issues*, *30*(1), 36-56.

Design Council (2015). Innovation by design. How design enables science and technology research to achieve greater impact. Available at: https://www.designcouncil.org.uk/resources/report/innovation-design> [Accessed: 26/11/2019].

Deutz, P., McGuire, M., Neighbour, G. (2013). Eco-design practice in the context of a structured design process: an interdisciplinary empirical study of UK manufacturers. *Journal of Cleaner Production*, *39*, 117-128.

Dewaele, J. M. (2018). Online questionnaires. In *The Palgrave handbook of applied linguistics research methodology* (pp. 269-286). London: Palgrave Macmillan.

Dewulf, K. (2010). Play it forward: A game-based tool for sustainable product and business model innovation in the fuzzy front end. In *6th EMSU conferences (ERSCP-2010)*. TUDelft.

Dey, P. K., Petridis, N. E., Petridis, K., Malesios, C., Nixon, J. D., Ghosh, S. K. (2018). Environmental management and corporate social responsibility practices of small and medium-sized enterprises. *Journal of Cleaner Production*, *195*, 687-702.

Dhar, R., Wertenbroch, K. (2000). Consumer choice between hedonic and utilitarian goods. *Journal of marketing research*, *37*(1), 60-71.

Diallo, M. F. (2012). Effects of store image and store brand price-image on store brand purchase intention: Application to an emerging market. *Journal of Retailing and Consumer Services*, *19*(3), 360-367.

Dilthey, W., (1883). *Introduction to the Human Sciences*. Selected Works (Volume I). Princeton, New Jersey: Princeton University Press.

d'Ippolito, B. (2014). The importance of design for firms' competitiveness: a review of the literature. *Technovation, forthcoming, 34*, 716-730.

Domi, A., Krasniqi, B. (2019). Entrepreneurs' Responses to an Economic Crisis: Evidence from a Transitional Economy. *Societal Entrepreneurship and Competitiveness, Emerald Publishing Limited*, 185-202.

dos Santos, B. M., Godoy, L. P., Campos, L. M. (2019). Performance evaluation of green suppliers using entropy-TOPSIS-F. *Journal of Cleaner Production*, *207*, 498-509.

Dunne, T. C., Aaron, J. R., McDowell, W. C., Urban, D. J., Geho, P. R. (2016). The impact of leadership on small business innovativeness. *Journal of Business Research*, *69*(11), 4876-4881.

Duran, P., Kammerlander, N., Van Essen, M., Zellweger, T. (2016). Doing more with less: Innovation input and output in family firms. *Academy of Management Journal*, *59*(4), 1224-1264.

Ebrahim, R., Ghoneim, A., Irani, Z., Fan, Y. (2016). A brand preference and repurchase intention model: The role of consumer experience. *Journal of Marketing Management*, *32*(13-14), 1230-1259.

Echavarren, J. M. (2017). From objective environmental problems to subjective environmental concern: a multilevel analysis using 30 indicators of environmental quality. *Society & natural resources, 30*(2), 145-159.

Egels-Zandén, N., Rosén, M. (2015). Sustainable strategy formation at a Swedish industrial company: bridging the strategy-as-practice and sustainability gap. *Journal of Cleaner Production, 96*, 139-147.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, *14*(4), 532-550.

Eisenhardt, K. M., Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of management journal*, *50*(1), 25-32.

Eisenman, M. (2017). A Multimodal Investigation of the Institutionalization of Aesthetic Design as a Dimension of Competition in the PC Industry. *Multimodality, meaning, and institutions*, *54*, 183-217.

Elkington J. (2008). The Triple Bottom Line. Sustainability Accountants. In Russo M.V. (Ed.), *Environmental Management. Readings and Cases* (2nd ed.). Los Angeles (CA): Sage.

Elkington, J. (1998). Partnerships from cannibals with forks: The triple bottom line of 21st-century business. *Environmental quality management*, *8*(1), 37-51.

Engert, S., Rauter, R., Baumgartner, R. J. (2016). Exploring the integration of corporate sustainability into strategic management: a literature review. *Journal of Cleaner Production*, *112*, 2833-2850.

Epstein, M. J. (2018). *Making sustainability work: Best practices in managing and measuring corporate social, environmental and economic impacts*. Routledge.

European Commission (2018). Annual Report on European SMEs 2017/2018. SMEs Growing Beyond Borders. Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. European Union. Available at: http://ec.europa.eu/growth/smes/business-friendly-environment/performance-review_en [Accessed: 29/11/2019].

Evans, S., Vladimirova, D., Holgado, M., Van Fossen, K., Yang, M., Silva, E. A., Barlow, C. Y. (2017). Business model innovation for sustainability: Towards a unified perspective for creation of sustainable business models. *Business Strategy and the Environment*, *26*(5), 597-608.

Fabris, G. (2008). *Societing. Il marketing nella società postmoderna.* Milano: EGEA.

Fagerlind, T., Stefanicki, M., Feldmann, A., Korhonen, J. (2019). The Distribution of Sustainable Decision-Making in Multinational Manufacturing Enterprises. *Sustainability*, *11*(18), 4871.

Falahat, M., Tehseen, S., Van Horne, C. (2018). Entrepreneurial Innovativeness and its Impact on SMEs Performances. *International Journal of Entrepreneurship*, *22*(3), 1-9.

Federico, G. (2017). Horizontal mergers, innovation and the competitive process. *Journal of European Competition Law & Practice*, *8*(10), 668-677.

Fernández, Z., Nieto, M. J. (2005). Internationalization strategy of small and medium-sized family businesses: Some influential factors. *Family Business Review*, *18*(1), 77-89.

Ferreira, J. J., Fernandes, C. I., Ratten, V. (2017). Entrepreneurship, innovation and competitiveness: what is the connection?. *International Journal of Business and Globalisation*, *18*(1), 73-95.

Ferrero, G. (2018). *Marketing e creazione del valore*. Torino: Giappichelli Editore.

Filippetti, A., D'Ippolito, B. (2017). Appropriability of design innovation across organisational boundaries: exploring collaborative relationships between manufacturing firms and designers in Italy. *Industry and Innovation*, *24*(6), 613-632.

Fishbein, M., Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, Mass: Addison-Wesley Pub. Co.

Flach, L., Irlacher, M. (2018). Product versus process: Innovation strategies of multiproduct firms. *American Economic Journal: Microeconomics*, *10*(1), 236-77.

Flusser, V. (2013). *The Shape of Things: a Philosophy of Design*. London: Reaktion Books.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative inquiry*, *12*(2), 219-245.

Fondazione Symbola, Deloitte Consulting (2019). Design Economy. *Quaderni di Symbola.* Available at: https://www.symbola.net/ricerca/design-economy-2019/ [Accessed: 12/12/2019].

Fornell, C., Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, *18*(1), 39-50.

Foroudi, P., Jin, Z., Gupta, S., Melewar, T. C., Foroudi, M. M. (2016). Influence of innovation capability and customer experience on reputation and loyalty. *Journal of business research*, *69*(11), 4882-4889.

Fortezza, F. (2014). *Marketing, felicità e nuove pratiche di consumo. Fra sharing, baratto e accesso*. Milano: FrancoAngeli.

Fowler Jr, F. J. (2013). *Survey research methods*. Sage publications.

Fuchs, C., Schreier, M. (2011). Customer empowerment in new product development. *Journal of product innovation management*, *28*(1), 17-32.

Gable, G. G. (1994). Integrating case study and survey research methods: an example in information systems. *European journal of information systems*, *3*(2), 112-126.

Gadenne, D. L., Kennedy, J., McKeiver, C. (2009). An empirical study of environmental awareness and practices in SMEs. *Journal of Business Ethics*, *84*(1), 45-63.

Galbreath, J. (2009). Addressing sustainability: A strategy development framework. *International Journal of Sustainable Strategic Management*, *1*(3), 303-319.

Galloni, L., Mangiarotti, R. (Eds.). (2005). *Disegnato in Italia: il design come elemento competitivo nella piccola e media impresa*. Hoepli Editore.

Garrido-Prada, P., Delgado-Rodriguez, M. J., Romero-Jordán, D. (2019). Effect of product and geographic diversification on company performance: Evidence during an economic crisis. *European Management Journal*, *37*(3), 269-286.

Garton, L., Haythornthwaite, C., Wellman, B. (1997). Studying online social networks. *Journal of computer-mediated communication*, *3*(1), JCMC313.

Gay, L., Airasian, P. (2000). *Educational Research: Competencies for Analysis and Application*. Columbus, OH: Prentice–Hall.

Gay, L.R., Mills, G.E., Airasian, P. (2009). *Educational research: Competencies for analysis and applications* (9th ed.). Upper Saddle River, NJ: Merrill.

Geissdoerfer, M., Savaget, P., Bocken, N. M., Hultink, E. J. (2017). The Circular Economy–A new sustainability paradigm?. *Journal of Cleaner Production*, *143*, 757-768.

Genç, R. (2017). The importance of communication in sustainability & sustainable strategies. *Procedia Manufacturing*, *8*, 511-516.

Geng, Y., Doberstein, B. (2008). Developing the circular economy in China: Challenges and opportunities for achieving'leapfrog development'. *The International Journal of Sustainable Development & World Ecology*, *15*(3), 231-239.

Geng, Y., Fu, J., Sarkis, J., Xue, B. (2012). Towards a national circular economy indicator system in China: an evaluation and critical analysis. *Journal of Cleaner Production*, *23*(1), 216-224.

Gentile-Lüdecke, S., de Oliveira, R. T., Paul, J. (2020). Does organizational structure facilitate inbound and outbound open innovation in SMEs?. *Small Business Economics*, *55*(4), 1091-1112.

George, A. L. and Bennett, A. (2005). *Case Studies and Theory Development in the Social Science*. Cambridge: MIT Press.

Gerlitz, L., Prause, G. (2017). Design management as a driver for Innovation in SMEs. *Kindai Management Review*, *5*, 41-58.

Gerring, J. (2004). What is a case study and what is it good for?. *American political science review*, *98*(2), 341-354.

Ghauri, P. (2004). Designing and conducting case studies in international business research. *Handbook of qualitative research methods for international business*, *1*(1), 109-124.

Ghisellini, P., Cialani, C., Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, *114*, 11-32.

Ghisetti, C., Montresor, S. (2018). Design and eco-innovation: micro-evidence from the Eurobarometer survey. *Industry and Innovation*, *26*(10), 1208-1241.

Gibbs, G., (2007). *Analysing Qualitative Data: The Sage Qualitative Research Kit*. London: Sage Publications Limited.

Gilal, N. G., Zhang, J., Gilal, F. G. (2018). Linking product design to consumer behavior: the moderating role of consumption experience. *Psychology Research and Behavior Management*, *11*, 169.

Givens, J. E., Jorgenson, A. K. (2011). The effects of affluence, economic development, and environmental degradation on environmental concern: A multilevel analysis. *Organization & Environment*, *24*(1), 74-91.

Glaser, B.G., Strauss, A.L., (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York: Aldine.

Glasow, P. A. (2005). Fundamentals of survey research methodology. *Retrieved January*, *18*, 2013.

Goel, R. K., Nelson, M. A. (2018). Determinants of process innovation introductions: Evidence from 115 developing countries. *Managerial and decision economics*, *39*(5), 515-525.

Goffman, E. (1959). *The presentation of self in everyday life.* New York: Doubleday.

Goffman, E., (1967). *Interaction Ritual*. New York: Doubleday.

González-García, S., Gasol, C. M., Lozano, R. G., Moreira, M. T., Gabarrell, X., i Pons, J. R., Feijoo, G. (2011). Assessing the global warming potential of wooden products from the furniture sector to improve their ecodesign. *Science of the Total Environment*, *410*, 16-25.

Gosetti, G. (2012). Work and spending habits: an exploration inside the" social issues" of crisis. *Italian Sociological Review*, *2*(3), 176-190.

Graedel, T. E., Allenby, B. R. (2010). *Industrial Ecology and Sustainable Engineering: International Edition* (p. 425). Pearson Education Inc., Upper Saddle River, Prentice Hall.

Graham, J. R., Harvey, C. R., Puri, M. (2015). Capital allocation and delegation of decision-making authority within firms. *Journal of financial economics*, *115*(3), 449-470.

Grant, R. M., Verona, G. (2015). What's holding back empirical research into organizational capabilities? Remedies for common problems. *Strategic Organization*, *13*(1), 61-74.

Grappi, S., Romani, S. (2015). Company post-crisis communication strategies and the psychological mechanism underlying consumer reactions. *Journal of Public Relations Research*, *27*(1), 22-45.

Grønhaug, K., Olson, O. (1999). Action research and knowledge creation: merits and challenges. *Qualitative Market Research: An International Journal, 2*(1), 6-14.

Groves, R. M., Fowler Jr, F. J., Couper, M. P., Lepkowski, J. M., Singer, E., Tourangeau, R. (2011). *Survey methodology* (Vol. 561). John Wiley & Sons.

Gruppo Unipol (2018). Annual Report. Available at: http://www.unipol.it/sites/corporate/files/sharingeconomyquaderno.pdf [Accessed: 15/01/2020].

Guckian, M., De Young, R., Harbo, S. (2017). Beyond green consumerism: uncovering the motivations of green citizenship. *Michigan Journal of Sustainability, 5*(1)73-94.

Gudmundson, D., Tower, C. B., Hartman, E. A. (2003). Innovation in small businesses: Culture and ownership structure do matter. *Journal of Developmental entrepreneurship*, *8*(1), 1.

Gustafsson, J. (2017). *Single case studies vs. multiple case studies: A comparative study.* Academy of Business, Engineering and Science, Halmstad University, Halmstad, Sweden.

Haas, W., Krausmann, F., Wiedenhofer, D., Heinz, M. (2015). How circular is the global economy?: An assessment of material flows, waste production, and recycling in the European Union and the world in 2005. *Journal of industrial ecology*, *19*(5), 765-777.

Haber, N., Fargnoli, M. (2017). Design for product-service systems: A procedure to enhance functional integration of product-service offerings. *International Journal of Product Development*, *22*(2), 135-164.

Hair, J., Black, W., Babin, B., & Anderson, R. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ, USA: Prentice-Hall, Inc.

Hamari, J., Sjöklint, M., Ukkonen, A. (2016). The sharing economy: Why people participate in collaborative consumption. *Journal of the association for information science and technology*, *67*(9), 2047-2059.

Hampson, D. P., Grimes, A., Banister, E., McGoldrick, P. J. (2018). A typology of consumers based on money attitudes after major recession. *Journal of Business Research*, *91*, 159-168.

Han, J., Forbes, H., Schaefer, D. (2019, July). An Exploration of the Relations between Functionality, Aesthetics and Creativity in Design. In *Proceedings of the Design Society: International Conference on Engineering Design* (Vol. 1, No. 1, pp. 259-268). Cambridge University Press.

Hanzaee, K. H., Andervazh, L. (2012). The influence of brand loyalty on cosmetics purchase intention of Iranian female consumers. *Journal of Basic and Applied Scientific Research*, *2*(5), 5389-5398.

Harmon, J., Fairfield, K. D. (2014). Relative effect of geographic context and international strategic approach on sustainability management. *International Journal of Sustainable Strategic Management*, *4*(3), 221-246.

Hashem, S., Migliore, G., Schifani, G., Schimmenti, E., Padel, S. (2018). Motives for buying local, organic food through English box schemes. *British Food Journal, 120*(7), 1600-1614.

Hashim, N. A., Mohammad, O., Haron, M. S. (2014). The impact of product cues and brand attitude towards purchase intention of automobiles. *Journal of Business Management and Accounting (JBMA)*, *4*, 15-30.

Hashmi, A. R., Biesebroeck, J. V. (2016). The relationship between market structure and innovation in industry equilibrium: a case study of the global automobile industry. *Review of Economics and Statistics*, *98*(1), 192-208.

He, P.; Lü, F.; Zhang, H.; Shao, L. (2013). Recent developments in the area of waste as a resource, with particular reference to the circular economy as a guiding principle. In Hester, R.E., Harrison, R. M. (Eds.), *Waste as a resource* (Volume 37, pp. 144-160). The Royal Society of Chemistry: Cambridge, UK.

Heikkurinen, P., Bonnedahl, K. J. (2013). Corporate responsibility for sustainable development: a review and conceptual comparison of market-and stakeholder-oriented strategies. *Journal of Cleaner Production*, *43*, 191-198.

Heo, J., Muralidharan, S. (2019). What triggers young Millennials to purchase eco-friendly products?: the interrelationships among knowledge, perceived consumer effectiveness, and environmental concern. *Journal of Marketing Communications*, *25*(4), 421-437.

Hernandez Pardo, R. J., Brissaud, D., Mathieux, F., Zwolinski, P. (2011). Contribution to the characterisation of eco-design projects. *International journal of sustainable engineering*, *4*(4), 301-312.

Hernández, R. J., Cooper, R., Tether, B., Murphy, E. (2018). Design, the language of innovation: A review of the design studies literature. *She Ji: The Journal of Design, Economics, and Innovation*, *4*(3), 249-274.

Hertenstein, J. H., Platt, M. B., Veryzer, R. W. (2013). What is' good design'? An investigation of the complexity and structure of design. *Design Management Journal*, *8*(1), 8-21.

Hochleitner, F. P., Arbussà, A., Coenders, G. (2017). Inbound open innovation in SMEs: indicators, non-financial outcomes and entry-timing. *Technology Analysis & Strategic Management*, *29*(2), 204-218.

Hochschorner, E., Finnveden, G. (2003). Evaluation of two simplified life cycle assessment methods. *The International Journal of Life Cycle Assessment*, *8*(3), 119.

Hodkinson, P., Hodkinson, H. (2001). The strengths and limitations of case study research. In *learning and skills development agency conference at Cambridge, 1* (1), 5-7.

Hoegg, J., Alba, J. W. (2011). Seeing is believing (too much): The influence of product form on perceptions of functional performance. *Journal of Product Innovation Management*, *28*(3), 346-359.

Hoffmann, V. E., Belussi, F., Martínez-Fernández, M. T., Reyes Jr, E. (2017). United we stand, divided we fall? Clustered firms' relationships after the 2008 crisis. *Entrepreneurship & Regional Development*, *29*(7-8), 735-758.

Holmberg, A., Alvinius, A. (2019). Children's protest in relation to the climate emergency: A qualitative study on a new form of resistance promoting political and social change. *Childhood*, 0907568219879970.

Holt, M. (2015). Transformation of the aesthetic: Art as participatory design. *Design and Culture*, *7*(2), 143-165.

Homburg, C., Schwemmle, M., Kuehnl, C. (2015). New product design: Concept, measurement, and consequences. *Journal of marketing, 79*(3), 41-56.

Hossain, M., Kauranen, I. (2016). Open innovation in SMEs: a systematic literature review. *Journal of Strategy and Management, 9*(1), 58-73.

Hoy, F., Sharma, P. (2010). *Entrepreneurial family firms*. Pearson College Division.

Huck, S.W. (2000). *Reading Statistics and Research* (3rd edition). New York: Longman.

Hüttel, A., Ziesemer, F., Peyer, M., Balderjahn, I. (2018). To purchase or not? Why consumers make economically (non-) sustainable consumption choices. *Journal of Cleaner Production*, *174*, 827-836.

Ibáñez-Forés, V., Pacheco-Blanco, B., Capuz-Rizo, S. F., Bovea, M. D. (2016). Environmental Product Declarations: Exploring their evolution and the factors affecting their demand in Europe. *Journal of Cleaner Production*, *116*, 157-169.

Ion, I. (2014). Households' adjustment to the economic crisis and the impact on the retail sector in Romania. *Revista de Management Comparat Internațional*, *15*(2), 174-189.

Isaac, S., Michael, W. B. (1997). *Handbook in research and evaluation: A collection of principles, methods, and strategies useful in the planning, design, and evaluation of studies in education and the behavioral sciences.* (3rd Ed.). San Diego: Educational and Industrial Testing Services.

Iuga, A., Popa, V., Popa, L. (2017, June). Industrial product life cycle stages and lifecycle eco-design. In *International Conference on Advanced Manufacturing Engineering and Technologies* (pp. 365-374). Springer, Cham.

Jalilvand, M. R., Samiei, N., Mahdavinia, S. H. (2011). The effect of brand equity components on purchase intention: An application of Aaker's model in the automobile industry. *International business and management*, *2*(2), 149-158.

Jansson, J. (2011). Consumer eco-innovation adoption: assessing attitudinal factors and perceived product characteristics. *Business Strategy and the Environment*, *20*(3), 192-210.

Jelinski, L. W., Graedel, T. E., Laudise, R. A., McCall, D. W., Patel, C. K. (1992). Industrial ecology: concepts and approaches. *Proceedings of the National Academy of Sciences*, *89*(3), 793-797.

Jin, C., Cui, Y. H. (2019). Eco-design Clothing Purchase, Usage and Disposal-A Cross-country Study of China and Korea. *Journal of Fashion Business*, *23*(3), 10-22.

Jindal, R. P., Sarangee, K. R., Echambadi, R., Lee, S. (2016). Designed to succeed: Dimensions of product design and their impact on market share. *Journal of Marketing*, *80*(4), 72-89.

Joachimiak-Lechman, K., Lewandowska, A., Strózik, T., Strózik, D. (2017). Environmental Classification of Products in a Context of Ecodesign in Small and Medium Enterprises. *Economic and Environmental Studies*, *17*(43), 491-513.

Johne, F. A., Snelson, P. A. (1988). Success factors in product innovation: a selective review of the literature. *Journal of Product Innovation Management: an international publication of the product development & management association*, *5*(2), 114-128.

Johnson, M. P., Schaltegger, S. (2016). Two decades of sustainability management tools for SMEs: how far have we come?. *Journal of Small Business Management*, *54*(2), 481-505.

Jöreskog, K. G., Herman, O. A. Wold (1982). The ML and PLS Techniques for Modeling with Latent Variables: Historical and Comparative Aspects. In H.O. A. Wold, K. G. Jöreskog (Eds.), *Systems under Indirect Observation, part I,* (pp. 263-270). Amsterdam: North-Holland.

Jorgenson, A. K., Givens, J. E. (2014). Economic globalization and environmental concern: A multilevel analysis of individuals within 37 nations. *Environment and Behavior*, *46*(7), 848-871.

Joshi, A., Kale, S., Chandel, S., Pal, D. K. (2015). Likert scale: Explored and explained. *Current Journal of Applied Science and Technology*, 396-403.

Joustra, D.J.; de Jong, E.; Engelaer, F. (2013). *Guided Choices towards a Circular Business Model.* Project C2C Bizz. Available at: http://www.c2cbizz.com/tools/c2c-bizz-guide-en.pdf%0A [Accessed: 11/02/2020].

Kaiser, F. G., Scheuthle, H. (2003). Two challenges to a moral extension of the theory of planned behavior: Moral norms and just world beliefs in conservationism. *Personality and individual differences*, *35*(5), 1033-1048.

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and psychological measurement*, *20*(1), 141-151.

Kallmuenzer, A., Scholl-Grissemann, U. (2017). Disentangling antecedents and performance effects of family SME innovation: A knowledge-based perspective. *International Entrepreneurship and Management Journal*, *13*(4), 1117-1138.

Kamins, M. A., & Gupta, K. (1994). Congruence between spokesperson and product type: A matchup hypothesis perspective. *Psychology & Marketing*, *11*(6), 569-586.

Katsikeas, C. S., Leonidou, C. N., Zeriti, A. (2016). Eco-friendly product development strategy: antecedents, outcomes, and contingent effects. *Journal of the Academy of Marketing Science*, *44*(6), 660-684.

Katz-Gerro, T., Cvetičanin, P., Leguina, A. (2017). Consumption and social change: Sustainable lifestyles in times of economic crisis. In *Social Change and the Coming of Post-consumer Society* (pp. 95-124). Routledge.

Keppel, G. (1991). *Design and analysis: A researcher's handbook*. Prentice-Hall, Inc.

Khateeb, A. H. N. M., Imam, S. M. A., Awad, S. S., Nasir, H. B. (2019). Target costs and the role of product design in achieving competitive advantage of the Iraqi companies. *International Journal of Economics, Commerce and Management*, *7*(2), 425-440.

Khun, T.S., (1962). *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.

Kim, A. J. Y., Ko, E. J. (2010). The impact of design characteristics on brand attitude and purchase intention-focus on luxury fashion brands. *Journal of the Korean Society of Clothing and Textiles*, *34*(2), 252-265.

Kim, H., Kim, H., Lee, P. M. (2008). Ownership structure and the relationship between financial slack and R&D investments: Evidence from Korean firms. *Organization Science*, *19*(3), 404-418.

Klewitz, J., Hansen, E. G. (2014). Sustainability-oriented innovation of SMEs: a systematic review. *Journal of Cleaner Production*, *65*, 57-75.

Kneipp, J. M., Gomes, C. M., Bichueti, R. S., Frizzo, K., Perlin, A. P. (2019). Sustainable innovation practices and their relationship with the performance of industrial companies. *Revista de Gestão, 26*(2), 94-111.

Knight, P., Jenkins, J. O. (2009). Adopting and applying eco-design techniques: a practitioners perspective. *Journal of Cleaner Production*, *17*(5), 549-558.

Kock, N. (2017). *WarpPLS user manual: Version* 6.0. ScriptWarp Systems: Laredo, TX, USA.

König, A., Kammerlander, N., Enders, A. (2013). The family innovator's dilemma: How family influence affects the adoption of discontinuous technologies by incumbent firms. *Academy of Management Review*, *38*(3), 418-441.

Koos, S., Vihalemm, T., Keller, M. (2017). Coping with crises: Consumption and social resilience on markets. *International Journal of Consumer Studies*, *41*(4), 363-370.

Korhonen, J., Honkasalo, A., Seppälä, J. (2018). Circular economy: the concept and its limitations. *Ecological economics*, *143*, 37-46.

Kotler, P., Rath, G. A. (1984). Design: A powerful but neglected strategic tool. *The Journal of Business Strategy*, *5*(2), 16-21.

Kramoliš, J., Staňková, P. (2017). Design and its impact on the financial results of enterprises (based on managers' opinions). *Journal of Competitiveness*, *9*(2), 62-77.

Kraus, S., Burtscher, J., Vallaster, C., Angerer, M. (2018). Sustainable entrepreneurship orientation: A reflection on status-quo research on factors facilitating responsible managerial practices. *Sustainability*, *10*(2), 444.

Krippendorff, K. (1989). On the essential contexts of artifacts or on the proposition that" design is making sense (of things)". *Design issues*, *5*(2), 9-39.

Krotova, E. A., Natalia, D., Galina, K., Nadezhda, K., Elena, P., Petrova, E. (2016). Educational Potential of Eco-Design of the Metropolis Urban Environment. *Indian Journal of Science and Technology*, *9*(14), 2-6.

Kumar, B., Asheq, A. A., Rahaman, M., Karim, M. (2019). Determinants of Social Media Marketing Adoption among Smes: A Conceptual Framework. *Academy of Marketing Studies Journal*, *23*(3).

Kumar, V., Sezersan, I., Garza-Reyes, J. A., Gonzalez, E. D., Moh'd Anwer, A. S. (2019). Circular economy in the manufacturing sector: benefits, opportunities and barriers. *Management Decision, 57* (4), 1067-1086.

Ladhari, R., Souiden, N., Dufour, B. (2017). The role of emotions in utilitarian service settings: The effects of emotional satisfaction on product perception and behavioral intentions. *Journal of Retailing and Consumer Services*, *34*, 10-18.

Laghezza, E., Lucchese, F. (2016). Il design italiano attraverso moda, arte, cinema, grafica e música dal Secondo Dopoguerra al 1969. *Dada Rivista di Antropologia post-globale, semestrale*, (1), 145-182.

Lamberton, C. P., Rose, R. L. (2012). When is ours better than mine? A framework for understanding and altering participation in commercial sharing systems. *Journal of Marketing*, *76*(4), 109-125.

Landeta-Manzano, B., Arana-Landín, G., RuizdeArbulo, P., DíazdeBasurto, P. (2017). Longitudinal Analysis of the Eco-Design Management Standardization Process in Furniture Companies. *Journal of Industrial Ecology*, *21*(5), 1356-1369.

Landoni, P., Dell'Era, C., Ferraloro, G., Peradotto, M., Karlsson, H., Verganti, R. (2016). Design contribution to the competitive performance of SMEs: The role of design innovation capabilities. *Creativity and Innovation Management*, *25*(4), 484-499.

Landwehr, J. R., Wentzel, D., Herrmann, A. (2013). Product design for the long run: Consumer responses to typical and atypical designs at different stages of exposure. *Journal of Marketing*, *77*(5), 92-107.

Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management review*, *24*(4), 691-710.

Lassala, C., Apetrei, A., Sapena, J. (2017). Sustainability matter and financial performance of companies. *Sustainability*, *9*(9), 1498.

Laubscher, M., Marinelli, T. (2014). Integration of circular economy in business. In *Proceedings of the Conference: Going Green–Care Innovation* (pp. 1-7).

Lawson, S. J., Gleim, M. R., Perren, R., Hwang, J. (2016). Freedom from ownership: An exploration of access-based consumption. *Journal of Business Research*, *69*(8), 2615-2623.

Lee, J., Lee, J. N. (2015). How purchase intention consummates purchase behaviour: the stochastic nature of product valuation in electronic commerce. *Behaviour & Information Technology*, *34*(1), 57-68.

Lee, K., Park, P. (2005). *ECODESIGN – best practice of ISO/TR 14062.* Eco-product Research Institute, Ajou University: The APEC Secretariat.

Lee, S. M., Trimi, S. (2018). Innovation for creating a smart future. *Journal of Innovation & Knowledge*, *3*(1), 1-8.

Lekakis, E. J. (2017). Economic nationalism and the cultural politics of consumption under austerity: The rise of ethnocentric consumption in Greece. *Journal of Consumer Culture*, *17*(2), 286-302.

Lewandowski, M. (2016). Designing the business models for circular economy—Towards the conceptual framework. *Sustainability*, *8*(1), 43.

Lianto, B., Dachyar, M., Soemardi, T. P. (2018). Continuous innovation: a literature review and future perspective. *International Journal on Advanced Science, Engineering and Information Technology*, *8*(3), 771-779.

Lieder, M., Rashid, A. (2016). Towards circular economy implementation: a comprehensive review in context of manufacturing industry. *Journal of Cleaner Production*, *115*, 36-51.

Lieven, T., Grohmann, B., Herrmann, A., Landwehr, J. R., Van Tilburg, M. (2015). The effect of brand design on brand gender perceptions and brand preference. *European Journal of Marketing, 49*(1/2), 146-169.

Lin, R. J., Tan, K. H., Geng, Y. (2013). Market demand, green product innovation, and firm performance: evidence from Vietnam motorcycle industry. *Journal of Cleaner Production*, *40*, 101-107.

Lincoln, Y. S., Guba, E. G. (1985). *Naturalistic Inquiry.* Newbury Park. California, USA: Sage Publications.

Lindberg, S., Roos, A., Kihlstedt, A., Lindström, M. (2013). A product semantic study of the influence of the sense of touch on the evaluation of wood-based materials. *Materials & Design (1980-2015)*, *52*, 300-307.

Linder, M., Williander, M. (2017). Circular business model innovation: inherent uncertainties. *Business strategy and the environment*, *26*(2), 182-196.

Link, M. W., Mokdad, A. H. (2005). Alternative modes for health surveillance surveys: an experiment with web, mail, and telephone. *Epidemiology*, 701-704.

Link, M. W., Mokdad, A. H. (2005). Effects of survey mode on self-reports of adult alcohol consumption: a comparison of mail, web and telephone approaches. *Journal of Studies on Alcohol*, *66*(2), 239-245.

Lioukas, C. S., Reuer, J. J., Zollo, M. (2016). Effects of information technology capabilities on strategic alliances: Implications for the resource-based view. *Journal of Management Studies*, *53*(2), 161-183.

Liu, S. X., de Bont, C. (2017). Barriers to Strategic Design: A Perspective from China. *She Ji: The Journal of Design, Economics, and Innovation*, *3*(2), 133-145.

Liu, Y., Bai, Y. (2014). An exploration of firms' awareness and behavior of developing circular economy: An empirical research in China. *Resources, Conservation and Recycling*, *87*, 145-152.

Liu, Y., Nousiainen, T., Imeri, S. (2015). Design as a source of international competitive advantage for SMOPEC firms. *International Journal of Innovation and Learning*, *18*(3), 277-298.

Luchs, M., Swan, K. S. (2011). Perspective: The emergence of product design as a field of marketing inquiry. *Journal of Product Innovation Management*, *28*(3), 327-345.

Lusk, J. L., McLaughlin, L., Jaeger, S. R. (2007). Strategy and response to purchase intention questions. *Marketing letters*, *18*(1-2), 31-44.

Lyle, J. T. (1996). *Regenerative design for sustainable development.* John Wiley & Sons.

MacArthur, E. (2013). Towards the circular economy, economic and business rationale for an accelerated transition. *Ellen MacArthur Foundation: Cowes, UK*, 21-34.

Magistretti, S., Dell'Era, C., De Massis, A., Frattini, F. (2019). Exploring the relationship between types of family involvement and collaborative innovation in design-intensive firms: insights from two leading players in the furniture industry. *Industry and Innovation*, *26*(10), 1121-1151.

Magnier, L., Crié, D. (2015). Communicating packaging eco-friendliness. *International Journal of Retail & Distribution Management*, *43*(4/5), 350-366.

Majama, N. S., Magang, T. I. T. (2017). Strategic planning in small and medium enterprises (SMEs): A case study of Botswana SMEs. *Journal of Management and Strategy*, *8*(1), 74-103.

March, S. T., Smith, G. F. (1995). Design and natural science research on information technology. *Decision support systems*, *15*(4), 251-266.

Marques, B., Tadeu, A., De Brito, J., Almeida, J. (2017). A perspective on the development of sustainable construction products: an eco-design approach. *International Journal of Sustainable Development and Planning*, *12*(2), 304-314.

Marshall, C., Rossman, G. B. (2006). Data collection methods. *Designing qualitative research*, *2*.

Martin, W. L., McKelvie, A., Lumpkin, G. T. (2016). Centralization and delegation practices in family versus non-family SMEs: a Rasch analysis. *Small Business Economics*, *47*(3), 755-769.

Maxwell, D., Van der Vorst, R. (2003). Developing sustainable products and services. *Journal of Cleaner Production*, *11*(8), 883-895.

McKenzie, N., Marks, I. (1999). Quick rating of depressed mood in patients with anxiety disorders. *British Journal of Psychiatry*, *174*(3), 266-269.

McKinsey Center for Business and Environment (2016). The circular economy: Moving from theory to practice. Available online: https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Sustainability/Our%20Insights/The%20circular%20economy%20Moving%20from%20theory%20to%20practice/The%20circular%20732 economy%20Moving%20from%20theory%20to%20practice.ashx [Accessed: 01/02/2019].

METI (2004). *Handbook on Resource Recycling Legislation and 3R Initiatives*. Ministry of Economy, Trade and Industry. Tokyo, Japan.

Micheli, P., Gemser, G. (2016). Signaling strategies for innovative design: A study on design tradition and expert attention. *Journal of Product Innovation Management*, *33*(5), 613-627.

Michna, A. (2018). The mediating role of firm innovativeness in the relationship between knowledge sharing and customer satisfaction in SMEs. *Engineering Economics*, *29*(1), 93-103.

Miles, M. B., Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage.

Millán, Á., Diaz, E. (2014). Analysis of consumers' response to brand community integration and brand identification. *Journal of Brand Management*, *21*(3), 254-272.

Miller, D., Le Breton-Miller, I. (2005). *Managing for the long run: Lessons in competitive advantage from great family businesses*. Harvard Business Press.

Mirabella, N., Castellani, V., Sala, S. (2014). LCA for assessing environmental benefit of eco-design strategies and forest wood short supply chain: a furniture case study. *The International Journal of Life Cycle Assessment*, *19*(8), 1536-1550.

Mirabi, V., Akbariyeh, H., Tahmasebifard, H. (2015). A study of factors affecting on customers purchase intention. *Journal of Multidisciplinary Engineering Science and Technology (JMEST)*, *2*(1), 267-273.

Moore, C. (2004). Declaring Victory: toward a new value proposition for business design. *Design Management Review*, *15*(2), 10-16.

Moravcikova, D., Krizanova, A., Kliestikova, J., Rypakova, M. (2017). Green Marketing as the Source of the Competitive Advantage of the Business. *Sustainability*, *9*(12), 2218.

Morgan, C. J., Croney, C. C., Widmar, N. J. O. (2016). Exploring Relationships between Ethical Consumption, Lifestyle Choices, and Social Responsibility. *Advances in Applied Sociology*, *6*(05), 199-216.

Morgan, T. R., Tokman, M., Richey, R. G., Defee, C. (2018). Resource commitment and sustainability: a reverse logistics performance process model. *International Journal of Physical Distribution & Logistics Management, 48*(2), 164-182.

Morioka, S. N., Bolis, I., Evans, S., Carvalho, M. M. (2017). Transforming sustainability challenges into competitive advantage: Multiple case studies kaleidoscope converging into sustainable business models. *Journal of Cleaner Production*, *167*, 723-738.

Morlino, L., Quaranta, M. (2016). What is the impact of the economic crisis on democracy? Evidence from Europe. *International Political Science Review*, *37*(5), 618-633.

Moroni, I., Arruda, A., Araujo, K. (2015). The design and technological innovation: how to understand the growth of startups companies in competitive business environment. *Procedia Manufacturing*, *3*, 2199-2204.

Morwitz, V. (2014). Consumers' purchase intentions and their behavior. *Foundations and Trends® in Marketing*, *7*(3), 181-230.

Mozota, B. B. (2003). *Design Management: Using Design to Build Brand Value and Corporate Innovation* (1st ed.). New York: Allworth.

Muijs, D. (2004). Validity, reliability and generalisability. *Doing quantitative research in education with SPSS*, 64-84.

Mulder, K. F. (2007). Innovation for sustainable development: from environmental design to transition management. *Sustainability Science*, *2*(2), 253-263.

Mulkay, B. (2019). How does competition affect innovation behaviour in French firms? *Structural Change and Economic Dynamics, 51,* 237-251.

Munari, F., Oriani, R., Sobrero, M. (2010). The effects of owner identity and external governance systems on R&D investments: A study of Western European firms. *Research Policy*, *39*(8), 1093-1104.

Murmura, F., Bravi, L. (2017). Empirical evidence about ISO 9001 and ISO 9004 in Italian companies. *The TQM Journal, 29*(5), 650-665.

Murmura, F., Bravi, L. (2018). Exploring customers' perceptions about Quality Management Systems: An empirical study in Italy. *Total Quality Management & Business Excellence*, *29*(11-12), 1466-1481.

Murmura, F., Liberatore, L., Bravi, L., Casolani, N. (2018). Evaluation of Italian companies' perception about ISO 14001 and Eco Management and Audit Scheme III: motivations, benefits and barriers. *Journal of Cleaner Production*, *174*, 691-700.

Murray, A., Skene, K., Haynes, K. (2017). The circular economy: an interdisciplinary exploration of the concept and application in a global context. *Journal of business ethics*, *140*(3), 369-380.

Na, J. H., Choi, Y., Harrison, D. (2017). The design innovation spectrum: An overview of design influences on innovation for manufacturing companies. *International Journal of Design*, *11*(2), 13-24.

Naidoo, V. (2010). Firm survival through a crisis: The influence of market orientation, marketing innovation and business strategy. *Industrial marketing management*, *39*(8), 1311-1320.

Naranjo-Gil, D. (2016). The role of management control systems and top teams in implementing environmental sustainability policies. *Sustainability*, *8*(4), 359.

Nardi, P. M. (2015). *Doing survey research*. Routledge.

Nawaz, W., Koç, M. (2018). Development of a systematic framework for sustainability management of organizations. *Journal of Cleaner Production*, *171*, 1255-1274.

Negassi, S., Lhuillery, S., Sattin, J. F., Hung, T. Y., Pratlong, F. (2019). Does the relationship between innovation and competition vary across industries? Comparison of public and private research enterprises. *Economics of Innovation and New Technology*, *28*(5), 465-482.

Neri, S., Ropele, T. (2015). The macroeconomic effects of the sovereign debt crisis in the euro area. *Bank of Italy Temi di Discussione (Working Paper) No*, *1007*.

Ness, D. (2008). Sustainable urban infrastructure in China: Towards a Factor 10 improvement in resource productivity through integrated infrastructure systems. *The International Journal of Sustainable Development & World Ecology*, *15*(4), 288-301.

Newton, J. D., Tsarenko, Y., Ferraro, C., Sands, S. (2015). Environmental concern and environmental purchase intentions: The mediating role of learning strategy. *Journal of Business Research*, *68*(9), 1974-1981.

Noble, C. H., Kumar, M. (2010). Exploring the appeal of product design: A grounded, value-based model of key design elements and relationships. Journal of Product Innovation Management, 27(5), 640-657.

North, J. (2017). Global consumer trends in store for 2018. *Food New Zealand*, *17*(6), 20-21.

Nosratabadi, S., Mosavi, A., Shamshirband, S., Kazimieras Zavadskas, E., Rakotonirainy, A., Chau, K. W. (2019). Sustainable business models: A review. *Sustainability*, *11*(6), 1663.

Nunnally, J. C., Bernstein, I. H. (1994). *Psychometric theory* (3rd edn). New York [etc].: McGraw-Hill.

Oke, A., Burke, G., Myers, A. (2007). Innovation types and performance in growing UK SMEs. *International Journal of Operations & Production Management, 27*(7), 735-753.

Olkowicz, M., Grzegorzewska, E. (2014). Eco-design as a strategic way to competitiveness in global markets for furniture family-owned MSMEs. *Journal of Intercultural Management*, *6*(4-1), 203-214.

Ortiz-Villajos, J. M., Sotoca, S. (2018). Innovation and business survival: A long-term approach. *Research Policy*, *47*(8), 1418-1436.

Osterwalder, A., Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*. John Wiley & Sons.

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Routledge.

Patton, E., Appelbaum, S.H., (2003). The Case for Case Studies in Management Research. *Management Research News*, 26(5), 60-71.

Patton, M. Q. (2014). *Qualitative research & evaluation methods: Integrating theory and practice*. Sage publications.

Pearce, D.W.; Turner, R.K. (1989). *Economics of Natural Resources and the Environment*. Hemel Hemstead.

Pece, A. M., Simona, O. E. O., Salisteanu, F. (2015). Innovation and economic growth: An empirical analysis for CEE countries. *Procedia Economics and Finance*, *26*, 461-467.

Peschl, M. F., Fundneider, T. (2016). Design as anticipation and innovation. In *Proceedings of DRS 2016, Design Research Society 50th Anniversary Conference* (pp. 1-14). Brighton, UK: DRS.

Petersen, M., Brockhaus, S. (2017). Dancing in the dark: Challenges for product developers to improve and communicate product sustainability. *Journal of Cleaner Production*, *161*, 345-354.

Petit, G., Sablayrolles, C., Yannou-Le Bris, G. (2018). Combining eco-social and environmental indicators to assess the sustainability performance of a food value chain: A case study. *Journal of Cleaner Production*, *191*, 135-143.

Petter, R. R. H., Resende, L. M., de Andrade Júnior, P. P., Horst, D. J. (2014). Systematic review: an analysis model for measuring the coopetitive performance in horizontal cooperation networks mapping the critical success factors and their variables. *The Annals of regional science*, *53*(1), 157-178.

Pierre, A., Fernandez, A. S. (2018). Going deeper into SMEs' innovation capacity: An empirical exploration of innovation capacity factors. *Journal of Innovation Economics Management*, (1), 139-181.

Pinsonneault, A., Kraemer, K. (1993). Survey research methodology in management information systems: an assessment. *Journal of management information systems, 10*(2), 75-105.

Pinto, G. L., Dell'Era, C., Verganti, R., Bellini, E. (2017). Innovation strategies in retail services: solutions, experiences and meanings. *European Journal of Innovation Management, 20*(2), 190-209.

Pisano, G. P. (2015). You need an innovation strategy. *Harvard Business Review*, *93*(6), 44-54.

Plewa, M. (2017). Long-Run Dynamics Between Product Life Cycle Length and Innovation Performance in Manufacturing. *International Journal of Innovation Management*, *21*(01), 1750006.

Plouffe, S., Lanoie, P., Berneman, C., Vernier, M. F. (2011). Economic benefits tied to ecodesign. *Journal of Cleaner Production*, *19*(6-7), 573-579.

Ponce, O. A., Pagán-Maldonado, N. (2015). Mixed methods research in education: Capturing the complexity of the profession. *International Journal of Educational Excellence*, *1*(1), 111-135.

Ponche, R., Hascoët, J. Y., Kerbrat, O., Mognol, P. (2012). A new global approach to design for additive manufacturing: A method to obtain a design that meets specifications while optimizing a given additive manufacturing process is presented in this paper. *Virtual and physical prototyping*, *7*(2), 93-105.

Popa, S., Soto-Acosta, P., Martinez-Conesa, I. (2017). Antecedents, moderators, and outcomes of innovation climate and open innovation: An empirical study in SMEs. *Technological Forecasting and Social Change*, *118*, 134-142.

Porter, M.E. (1985). *Competitive Advantage.* New York: Free Press.

Poulikidou, S. (2012). *Literature review: Methods and tools for environmentally friendly product design and development: Identification of their relevance to the vehicle design context.* Royal Institute of Technology, Stockholm, Sweden.

Pradhan, D., Duraipandian, I., Sethi, D. (2016). Celebrity endorsement: How celebrity–brand–user personality congruence affects brand attitude and purchase intention. *Journal of Marketing Communications*, *22*(5), 456-473.

Prendeville, S. M., O'Connor, F., Bocken, N. M., Bakker, C. (2017). Uncovering ecodesign dilemmas: A path to business model innovation. *Journal of Cleaner Production*, *143*, 1327-1339.

Prendeville, S., Sanders, C., Sherry, J., Costa, F. (2014). Circular economy: is it enough. EcoDesign Centre, Wales. Available at: http://www.edcw.org/en/resources/circulareconomy-it-enough [Accessed on 19/12/2019].

Prentice, D. A. (1987). Psychological correspondence of possessions, attitudes, and values. *Journal of personality and social psychology*, *53*(6), 993-1003.

Press, M., Cooper, R. (2017). *The design experience: the role of design and designers in the twenty-first century*. Routledge.

Priporas, C. V., Kamenidou, I., Kapoulas, A., Papadopoulou, F. M. (2015). Counterfeit purchase typologies during an economic crisis. *European Business Review, 27*(1), 2-16.

Purohit, H. (2017). Comprehending the Thoroughfare to Sustainable Development: The Role of Corporate Leaders. *International Journal on Leadership*, *5*(1), 17-21.

Qian, L., Wang, I. K. (2017). Competition and innovation: The tango of the market and technology in the competitive landscape. *Managerial and Decision Economics, 38*(8), 1237-1247.

Raghupathi, V., Raghupathi, W. (2017). Innovation at country-level: association between economic development and patents. *Journal of Innovation and Entrepreneurship*, *6*(1), 1-20.

Ralph, P., Wand, Y. (2009). A proposal for a formal definition of the design concept. In *Design requirements engineering: A ten-year perspective* (pp. 103-136). Springer, Berlin, Heidelberg.

Rapporto FederlegnoArredo (2019). Available at: https://www.federlegnoarredo.it/it/servizi/centro-studi-dati-e-ricerche/tutte-le-news/tutte-le-news/online-rapporto-federlegnoarredo-2018 [Accessed: 24/03/2020].

Rashid, A., Asif, F. M., Krajnik, P., Nicolescu, C. M. (2013). Resource Conservative Manufacturing: an essential change in business and technology paradigm for sustainable manufacturing. *Journal of Cleaner Production*, *57*, 166-177.

Rego, A., e Cunha, M. P., Polónia, D. (2017). Corporate sustainability: A view from the top. *Journal of Business Ethics*, *143*(1), 133-157.

Reimann, M., Zaichkowsky, J., Neuhaus, C., Bender, T., Weber, B. (2010). Aesthetic package design: A behavioral, neural, and psychological investigation. *Journal of consumer psychology*, *20*(4), 431-441.

Reyes-Rodríguez, J. F., Ulhøi, J. P., Madsen, H. (2016). Corporate environmental sustainability in Danish SMEs: A longitudinal study of motivators, initiatives, and strategic effects. *Corporate Social Responsibility and Environmental Management*, *23*(4), 193-212.

Rezai, G., Sumin, V., Mohamed, Z., Shamsudin, M. N., Sharifuddin, J. (2016). Implementing green practices as sustainable innovation among herbal-based SME entrepreneurs. *Journal of food products marketing*, *22*(1), 1-18.

Ricci, C., Marinelli, N., Puliti, L. (2016). The consumer as citizen: the role of ethics for a sustainable consumption. *Agriculture and agricultural science procedia*, *8*, 395-401.

Rizos, V., Behrens, A., Kafyeke, T., Hirschnitz-Garbers, M., Ioannou, A. (2015). The Circular Economy: Barriers and Opportunities for SMEs (No. 412). *CEPS Working Document.(Centre for European Policy Studies (CEPS), 2015)*.

Rocha, C. S., Antunes, P., Partidário, P. (2019). Design for sustainability models: A multiperspective review. *Journal of Cleaner Production*, *234*, 1428-1445.

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin III, F. S., Lambin, E., ... & Nykvist, B. (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and society*, *14*(2).

Roessl, D., Fink, M., Kraus, S. (2010). Are family firms fit for innovation? Towards an agenda for empirical research. *International Journal of Entrepreneurial Venturing*, *2*(3-4), 366-380.

Rossi, M., Germani, M., Zamagni, A. (2016). Review of ecodesign methods and tools. Barriers and strategies for an effective implementation in industrial companies. *Journal of Cleaner Production*, *129*, 361-373.

Roy, R., Potter, S. (1993). The commercial impacts of investment in design. *Design studies*, *14*(2), 171-193.

Roy, R., Riedel, J. C. (1997). Design and innovation in successful product competition. *Technovation*, *17*(10), 537-594.

Rubera, G. (2015). Design innovativeness and product sales' evolution. *Marketing Science*, *34*(1), 98-115.

Rubera, G., Droge, C. (2013). Technology versus design innovation's effects on sales and Tobin's Q: The moderating role of branding strategy. *Journal of Product Innovation Management*, *30*(3), 448-464.

Rubera, G., Kirca, A. H. (2017). You gotta serve somebody: the effects of firm innovation on customer satisfaction and firm value. *Journal of the Academy of Marketing Science*, *45*(5), 741-761.

Rusinko, C. A. (2005). Using quality management as a bridge to environmental sustainability in organizations. *SAM Advanced Management Journal*, *70*(4), 54.

Rusten, G., Bryson, J. R. (2010). Industrial design, competitiveness, globalization and organizational strategy. In *Industrial Design, Competition and Globalization* (pp. 1-20). Palgrave Macmillan, London.

Sachdeva, I., Goel, S. (2015). Retail store environment and customer experience: a paradigm. *Journal of Fashion Marketing and Management, 19*(3), 290-298.

Sáez-Martínez, F. J., Díaz-García, C., González-Moreno, Á. (2016). Factors promoting environmental responsibility in European SMEs: The effect on performance. *Sustainability*, *8*(9), 898.

Sanchez, G. (2013). *PLS path modeling with R.* Berkeley: Trowchez Editions, 383.

Santoro, G., Ferraris, A., Giacosa, E., Giovando, G. (2018). How SMEs engage in open innovation: a survey. *Journal of the Knowledge Economy*, *9*(2), 561-574.

Santos, G., Murmura, F., Bravi, L. (2018). SA 8000 as a Tool for a Sustainable Development Strategy. *Corporate Social Responsibility and Environmental Management*, *25*(1), 95-105.

Santos, G., Rebelo, M., Lopes, N., Alves, M. R., Silva, R. (2016). Implementing and certifying ISO 14001 in Portugal: motives, difficulties and benefits after ISO 9001 certification. *Total Quality Management & Business Excellence*, *27*(11-12), 1211-1223.

Santos, J. R. A. (1999). Cronbach's alpha: A tool for assessing the reliability of scales. *Journal of extension*, *37*(2), 1-5.

Sariatli, F. (2017). Linear Economy versus Circular Economy: A comparative and analyzer study for Optimization of Economy for Sustainability. *Visegrad Journal on Bioeconomy and Sustainable Development*, *6*(1), 31-34.

Satyro, W. C., Sacomano, J. B., Contador, J. C., Almeida, C. M., Giannetti, B. F. (2017). Process of strategy formulation for sustainable environmental development: Basic model. *Journal of Cleaner Production*, *166*, 1295-1304.

Scarpellini, S., Marín-Vinuesa, L. M., Portillo-Tarragona, P., Moneva, J. M. (2018). Defining and measuring different dimensions of financial resources for business eco-innovation and the influence of the firms' capabilities. *Journal of Cleaner Production*, *204*, 258-269.

Schaltegger, S., Hansen, E. G., Lüdeke-Freund, F. (2016). Business Models for Sustainability: Origins, Present Research, and Future Avenues. *Organization & Environment*, *29*(1), 3-10.

Schmidt, M.J., Hollensen, S., (2006). *Marketing Research. An International Approach*. Harlow, England: Prentice Hall.

Schreier, M., Fuchs, C., Dahl, D. W. (2012). The innovation effect of user design: Exploring consumers' innovation perceptions of firms selling products designed by users. *Journal of Marketing*, *76*(5), 18-32.

Schuler, A.; Buehlmann, U. (2003). *Identifying future competitive business strategies for the US residential wood* 928 *furniture industry: Benchmarking and paradigm shifts*. USDA: Delaware.

Schumpeter, J. (1943). *Capitalism, Socialism and Democracy.* London: Allen Un-win.

Schutz, A., (1967). *Der sinnhafte Aufbau der sozialen Welt. Eine Einleitung in die verstehende Soziologie.* Wien: Springer.

Schwartz, S. H. (1977). Normative influences on altruism. *Advances in experimental social psychology*, *10*(1), 221-279.

Scott, J. T. (2017). *The sustainable business: A practitioner's guide to achieving long-term profitability and competitiveness*. Routledge.

Shu, P., Steinwender, C. (2019). The impact of trade liberalization on firm productivity and innovation. *Innovation Policy and the Economy*, *19*(1), 39-68.

Simon, H. A. (1969). *The sciences of the artificial.* Cambridge, MA.

Sirgy, M. J. (1982). Self-concept in consumer behavior: A critical review. *Journal of consumer research*, *9*(3), 287-300.

Sirmon, D. G., Hitt, M. A. (2003). Managing resources: Linking unique resources, management, and wealth creation in family firms. *Entrepreneurship theory and practice*, *27*(4), 339-358.

Skidelsky, R., Fraccaroli, N. (2017). A Stimulus Policy for the UK. In *Austerity vs Stimulus* (pp. 139-147). Palgrave Macmillan, Cham.

Skogen, K., Helland, H., Kaltenborn, B. (2018). Concern about climate change, biodiversity loss, habitat degradation and landscape change: Embedded in different packages of environmental concern?. Journal for Nature Conservation, 44, 12-20.

Slavoljub, J., Zivkovic, L., Sladjana, A., Dragica, G., Zorica, P. S. (2015). To the environmental responsibility among students through developing their environmental values. *Procedia-Social and Behavioral Sciences*, *171*, 317-322.

Sok, P., O'Cass, A. (2015). Examining the new product innovation–performance relationship: Optimizing the role of individual-level creativity and attention-to-detail. *Industrial Marketing Management*, *47*, 156-165.

Srinivasan, R., Lilien, G. L., Rangaswamy, A., Pingitore, G. M., Seldin, D. (2012). The total product design concept and an application to the auto market. *Journal of Product Innovation Management*, *29*, 3-20.

Srivastava, R. K., Fahey, L., Christensen, H. K. (2001). The resource-based view and marketing: The role of market-based assets in gaining competitive advantage. *Journal of management*, *27*(6), 777-802.

Stahel, W. (2010). *The performance economy*. Springer.

Stahel, W. R. (2016). The circular economy. *Nature, 531*(7595), 435-438.

Stake, R. E. (1995). *The art of case study research*. sage. Thousand Oaks, CA: Sage.

Stake, R.E., (1998). Case Studies. In N. & Y. Lincoln. (eds.), *Strategies of Qualitative Inquiry.* Thousand Oaks, London, New Delhi: Sage.

Stake, R.E., (2000). Case Studies. In N.K. Denzin and Y.S. Lincoln, Eds. (2nd ed.), *Handbook of Qualitative Research*. Thousand Oaks: Sage.

Staniewski, M. W., Nowacki, R., Awruk, K. (2016). Entrepreneurship and innovativeness of small and medium-sized construction enterprises. *International Entrepreneurship and Management Journal*, *12*(3), 861-877.

Starman, A. B. (2013). The case study as a type of qualitative research. *Journal of Contemporary Educational Studies/Sodobna Pedagogika*, *64*(1).

Steinmetz, A. (2015). Competition, innovation, and the effect of R&D knowledge. *Journal of Economics*, *115*(3), 199-230.

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human ecology review*, 81-97.

Stevenson, R. S., Evans, J. W. (2004). Editorial to: cutting across interests: cleaner production, the unified force of sustainable development. *Journal of Cleaner Production*, *3*(12), 185-187.

Stone, G., Barnes, J. H., Montgomery, C. (1995). Ecoscale: a scale for the measurement of environmentally responsible consumers. *Psychology & Marketing*, *12*(7), 595-612.

Strauss, A., Corbin, J. (1998). *Basics of qualitative research techniques*. Thousand Oaks, CA: Sage publications.

Sutapa, S., Mulyana, M., Wasitowati, W. (2017). The role of market orientation, creativity and innovation in creating competitive advantages and creative industry performance. *JDM (Jurnal Dinamika Manajemen)*, *8*(2), 152-166.

Tabeau, K., Gemser, G., Hultink, E. J., Wijnberg, N. M. (2017). Exploration and exploitation activities for design innovation. *Journal of Marketing Management*, *33*(3-4), 203-225.

Talay, M. B., Townsend, J. D. (2015). Do or die: competitive effects and Red Queen dynamics in the product survival race. *Industrial and Corporate Change*, *24*(3), 721-738.

Tashakkori, A., Creswell, J. W. (2007). The new era of mixed methods [Editorial]. *Journal of mixed methods research*, *1*(1), 3-7.

Tellis, W. M. (1997). Introduction to Case Study. *The Qualitative Report*, *3*(2), 1-14.

Terziovski, M. (2010). Innovation practice and its performance implications in small and medium enterprises (SMEs) in the manufacturing sector: a resource-based view. *Strategic Management Journal*, *31*(8), 892-902.

Testa, F., Rizzi, F., Daddi, T., Gusmerotti, N. M., Frey, M., Iraldo, F. (2014). EMAS and ISO 14001: the differences in effectively improving environmental performance. *Journal of Cleaner Production*, *68*, 165-173.

Tian, K. T., Bearden, W. O., Hunter, G. L. (2001). Consumers' need for uniqueness: Scale development and validation. *Journal of consumer research*, *28*(1), 50-66.

Toh, C., Miller, S. R. (2019). Does the preferences for creativity scale predict engineering students' ability to generate and select creative design alternatives?. *Journal of Mechanical Design*, *141*(6).

Tonkinwise, C. (2011). A taste for practices: Unrepressing style in design thinking. *Design Studies*, *32*(6), 533-545.

Toufani, S., Stanton, J. P., Chikweche, T. (2017). The importance of aesthetics on customers' intentions to purchase smartphones. *Marketing Intelligence & Planning, 35*(3), 316-338.

Triguero, A., Moreno-Mondéjar, L., Davia, M. A. (2013). Drivers of different types of eco-innovation in European SMEs. *Ecological economics*, *92*, 25-33.

Trivedi, R. H., Patel, J. D., Acharya, N. (2018). Causality analysis of media influence on environmental attitude, intention and behaviors leading to green purchasing. *Journal of Cleaner Production*, *196*, 11-22.

Trochim, W. M. (2005). *Research methods: The concise knowledge base*. Atomic Dog Publishing.

Tu, J. C., Yang, C. H. (2019). Consumer Needs for Hand-Touch Product Designs Based on the Experience Economy. *Sustainability*, *11*(7), 2064.

Tukker, A. (2015). Product services for a resource-efficient and circular economy–a review. *Journal of Cleaner Production*, *97*, 76-91.

Tuli, F. (2010). The basis of distinction between qualitative and quantitative research in social science: Reflection on ontological, epistemological and methodological perspectives. *Ethiopian Journal of Education and Sciences*, *6*(1), 97-108.

Tura, N., Hanski, J., Ahola, T., Ståhle, M., Piiparinen, S., Valkokari, P. (2019). Unlocking circular business: A framework of barriers and drivers. *Journal of Cleaner Production*, *212*, 90-98.

Turner, R. K., Pearce, D. W. (1990). *The ethical foundations of sustainable economic development*. International Institute for Environment and Development.

Tussyadiah, I. P. (2015). An exploratory study on drivers and deterrents of collaborative consumption in travel. In *Information and communication technologies in tourism 2015* (pp. 817-830). Springer, Cham.

Ughanwa, D. O., Baker, M. J. (2018). *The role of design in international competitiveness* (Vol. 29). Routledge.

United Nations General Assembly. (1987). *Report of the world commission on environment and development: Our common future.* Oslo, Norway: United Nations General Assembly, Development and International Co-operation: Environment.

Urbonavičius, S., Pikturnienė, I. (2010). Consumers in the face of economic crisis: evidence from two generations in Lithuania. *Ekonomika ir vadyba*, (15), 827-834.

Van Hal, G. (2015). The true cost of the economic crisis on psychological well-being: a review. *Psychology research and behavior management*, *8*, 17-25.

Van Hemel, C., Cramer, J. (2002). Barriers and stimuli for ecodesign in SMEs. *Journal of Cleaner Production*, *10*(5), 439-453.

Verganti, R. (2006). Innovating through design. *Harvard business review*, *84*(12), 114.

Veryzer, R. W., Habsburg, S., Veryzer, R. (1999). Managing the challenge of Design for Innovation. *Design Management Journal (Former Series)*, *10*(4), 29-34.

Vial, S. (2017). The Project or the Specificity of Design Thinking. In *Creativity, Design Thinking and Interdisciplinarity* (pp. 135-148). Springer, Singapore.

Vickery, S. K., Dröge, C., & Markland, R. E. (1997). Dimensions of manufacturing strength in the furniture industry. *Journal of Operations Management*, *15*(4), 317-330.

Vihalemm, T., Keller, M., Pihu, K. (2016). Consumers during the 2008-2011 Economic Crisis in Estonia: Mainstream and Grass Roots Media Discourses. *Italian Sociological Review*, *6*(1), 57-86.

Vinci, G., D'Ascenzo, F., Esposito, A., Musarra, M., Rapa, M., Rocchi, A. (2019). A sustainable innovation in the Italian glass production: LCA and Eco-Care matrix evaluation. *Journal of Cleaner Production*, *223*, 587-595.

Vissak, T. (2010). Recommendations for using the case study method in international business research. *Qualitative Report*, *15*(2), 370-388.

Wahyuni, D., Ratnatunga, J. (2015). Carbon strategies and management practices in an uncertain carbonomic environment–lessons learned from the coal-face. *Journal of Cleaner Production*, *96*, 397-406.

Wakulele, S. R., Odock, S., Chepkulei, B., Kiswili, N. E. (2016). Effect of Eco-design Practices on the Performance of Manufacturing Firms in Mombasa County, Kenya. *International Journal of Business and Social Science*, *7*(8), 109-132.

Walsh, V., Roy, R., Bruce, M. (1988). Competitive by design. *Journal of Marketing Management*, *4*(2), 201-216.

Wang, G., Wang, Y., Zhao, T. (2008). Analysis of interactions among the barriers to energy saving in China. *Energy Policy*, *36*(6), 1879-1889.

Wang, S., Wang, J., Yang, F., Wang, Y., Li, J. (2018). Consumer familiarity, ambiguity tolerance, and purchase behavior toward remanufactured products: The implications for remanufacturers. *Business Strategy and the Environment*, *27*(8), 1741-1750.

Wanous, J. P., Hudy, M. J. (2001). Single-item reliability: A replication and extension. *Organizational Research Methods*, *4*(4), 361-375.

Waterworth, J., Hoshi, K. (2016). The Foundations of Human-Experiential Design. In *Human-Experiential Design of Presence in Everyday Blended Reality* (pp. 31-46). Springer, Cham.

Watkins, L., Aitken, R., Mather, D. (2016). Conscientious consumers: a relationship between moral foundations, political orientation and sustainable consumption. *Journal of Cleaner Production*, *134*, 137-146.

Weber, M., (1904). *The "Objectivity" in Social Science and Social Policy.* In *The Methodology of the Social Sciences*, trans. Edward Shils and Henry Finch. New York: Free Press [1949].

Webster, K. (2017). *The circular economy: A wealth of flows*. Ellen MacArthur Foundation Publishing.

Wee, C. S., Ariff, M. S. B. M., Zakuan, N., Tajudin, M. N. M., Ismail, K., Ishak, N. (2014). Consumers perception, purchase intention and actual purchase behavior of organic food products. *Review of Integrative Business and Economics Research*, *3*(2), 378-397.

Weisberg, H. F. (2008). The methodological strengths and weaknesses of survey research. *The SAGE handbook of public opinion research*, 223-231.

Wellman, B.(1997). An electronic group is virtually a social network. In S. Kiesler (Ed.), *Culture of the Internet* (pp.179 – 205). Mahwah, NJ: Lawrence Erlbaum.

Whelan, T., Fink, C. (2016). The comprehensive business case for sustainability. *Harvard Business Review*, *21*, 1-12.

Whicher, A. (2017). Design ecosystems and innovation policy in Europe. *Strategic Design Research Journal*, *10*(2), 117-125.

Whicher, A., Raulik-Murphy, G., Cawood, G. (2011). Evaluating design: Understanding the return on investment. *Design Management Review*, *22*(2), 44-52.

Wijethilake, C., Lama, T. (2019). Sustainability core values and sustainability risk management: Moderating effects of top management commitment and stakeholder pressure. *Business Strategy and the Environment*, *28*(1), 143-154.

Wilhide, E. (2016). *Design: the whole story.* London: Thames & Hudson.

Windelband, W., Oakes, G. (1894/1980). History and natural science. *History and theory*, *19*(2), 165-168.

Witczak, J., Kasprzak, J., Klos, Z., Kurczewski, P., Lewandowska, A., Lewicki, R. (2014). Life cycle thinking in small and medium enterprises: the results of research on the implementation of life cycle tools in Polish SMEs—part 2: LCA related aspects. *The International Journal of Life Cycle Assessment*, *19*(4), 891-900.

Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of computer-mediated communication*, *10*(3), JCMC1034.

Wright, M. (2017). Innovation and ownership variety. *Innovation*, *19*(1), 74-79.

Wu, G. C. (2017). Effects of socially responsible supplier development and sustainability-oriented innovation on sustainable development: Empirical evidence from SMEs. *Corporate Social Responsibility and Environmental Management*, *24*(6), 661-675.

Xu, L., Prybutok, V., Blankson, C. (2019). An environmental awareness purchasing intention model. *Industrial Management & Data Systems*, *119*(2), 367-381.

Xu, X., Hua, Y., Wang, S., Xu, G. (2020). Determinants of consumer's intention to purchase authentic green furniture. *Resources, Conservation and Recycling*, *156*, 104721.

Yeung, C. W., Wyer Jr, R. S. (2005). Does loving a brand mean loving its products? The role of brand-elicited affect in brand extension evaluations. *Journal of Marketing Research*, *42*(4), 495-506.

Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European journal of education*, *48*(2), 311-325.

Yin, R. K. (1981). The case study as a serious research strategy. *Knowledge*, *3*(1), 97-114.

Yin, R. K. (1984). *Case study research: Design and methods*. Beverly Hills, CA: Sage Publications.

Yin, R. K. (1994). *Case Study Research: Design and methods*. Thousands Oaks: Sage Publications.

Yuan, Z., Bi, J., Moriguichi, Y. (2006). The circular economy: A new development strategy in China. *Journal of Industrial Ecology*, *10*(1-2), 4-8.

Yue, B., Sheng, G., She, S., Xu, J. (2020). Impact of Consumer Environmental Responsibility on Green Consumption Behavior in China: The Role of Environmental Concern and Price Sensitivity. *Sustainability*, *12*(5), 2074.

Zhang, J., Chen, L. (2014). The review of SMEs open innovation performance. *American Journal of Industrial and Business Management*, *4*(12), 716.

Zhijun, F., Nailing, Y. (2007). Putting a circular economy into practice in China. *Sustainability Science*, *2*(1), 95-101.

Zhu, D. J., Qiu, S. F. (2007). Analytical tool for urban circular economy planning and its preliminary application: a case of Shanghai. *City Planning Review*, *31*(3), 64-69.

Zwierzyński, P. (2017). The determinants of consumer behaviours in the furniture market. *Annals of Marketing Management & Economics*, *3*(1), 131-143.

SITOGRAPHY

Barkworth, H. 2014. Six Trends That Will Shape Consumer Behavior This Year. Forbes Magazine. Available at: https://www.forbes.com/sites/onmarketing/2014/02/04/six-trends-that-will-shape-consumer-behavior-this-year/ [Accessed: 03/02/2019].

Design for Europe (2019). Available at: http://www.designforeurope.eu [Accessed: 22/11/19].

Eur-Lex. Access to European Union law. Directive 2008/98/EC of the European Parliament and of the 820 Council of 19 november 2008 on waste and repealing certain directives. Available online: https://eur-821 lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0098&from=EN [Accessed: 30/12/2018].

Eur-Lex. Access to European Union Law (2019). *EUR-Lex - 32003H0361 - EN - EUR-Lex*. Available at: https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=celex%3A32003H0361 [Accessed: 23/04/2019].

Eur-lex.europa.eu. Access to European Union Law (2020). *EUR-Lex - 32014L0095 - EN - EUR-Lex*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0095 [Accessed: 10/02/2020].

Eur Lex. Access to European Union Law (2020). *EUR-Lex - 32009L0125 - EN - EUR-Lex*. Available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0125 [Accessed: 13/02/2020].

European Commission (2013). Internal Market, Industry, Entrepreneurship and SMEs – European Commission. Available at: https://ec.europa.eu/growth/industry/innovation/policy/design_en [Accessed: 26/11/2019].

European Commission MEMO (2014). Questions and Answers on the Commission Communication "Towards a Circular Economy" and the Waste Targets Review. Available at: https://ec.europa.eu/commission/presscorner/detail/en/MEMO_14_450 [Accessed: 30/12/2018].

European Commission (2015). Closing the Loop – An EU Action Plan for the Circular Economy COM/2015/0614 *Final.* Available at: https://www.eea.europa.eu/policy-documents/com-2015-0614-final [Accessed: 26/11/2019].

European Union (2017). Circular Economy: Commission delivers on its promises, offers guidance on recovery of energy from waste & works with EIB to boost investment. Available at: https://ec.europa.eu/commission/presscorner/detail/en/MEMO_17_105 [Accessed: 28/02/2020].

Eurostat Statistic Explained (2019). GDP per capita, consumption per capita and price level indices. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=GDPper_capita,_consumption_per_capita_and_price_level_indices#Relative_volumes_of_consumption_per_capita [Accessed: 29/12/2019].

Eurostat Statistic Explained (2019). Living conditions in Europe - poverty and social exclusion. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Living_conditions_in_Europe_-_poverty_and_social_exclusion [Accessed: 29/12/2019].

Fabrik (2019). Green brands: Eco friendly companies to learn from. Available at: https://fabrikbrands.com/eco-friendly-companies/ [Accessed: 25/01/2020].

ICECAT. Profitable shift to Circular Economy for Manufacturers and Retailers. Available at: https://iceclog.com/profitable-shift-to-circular-economy-for-manufacturers-and-retailers-monetize-waste-boost-sales-while-saving-the-environment/ [Accessed: 29/11/2018].

IKEA. Regolamento Servizio Riporta e "Rivendi". Available at: https://www.ikea.com/it/it/customer-service/regolamento-dai-una-seconda-vita-ai-tuoi-mobili-usati-ikea-pub164421ab [Accessed: 17/01/2020].

Istat (2019). Statistiche Report – Le spese per i consumi delle famiglie | Anno 2018. Available at: https://www.istat.it/it/files/2019/06/Spese-delle-famiglie-Anno-2018_rev.pdf [Accessed: 15/01/2020].

McKinsey Center for Business and Environment. The circular economy: Moving from theory to practice. Available at: https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Sustainability/Our%20Insights/The%20circular%20economy%20Moving%20from%20theory%20to%20practice/The%20circular%20732 economy%20Moving%20from%20theory%20to%20practice.ashx [Accessed: 01/02/2019].

McNamara, R. (2019). Britain's Great Exhibition of 1851. Available at: https://www.thoughtco.com/britains-great-exhibition-of-1851-1773797 [Accessed: 26/11/2019].

QuiFinanza (2019). Consumi, boom del biologico: nel carrello per 2 italiani su 3. Available at: https://quifinanza.it/green/consumi-boom-biologico-nel-carrello-per-2-italiani-su-3/306489/ [Accessed: 15/01/2020].

SEE, "Reviewing Design Support Programmes in Europe", SEE Policy Booklet 6, 2013b. Available at: https://ec.europa.eu/easme/sites/easme-site/files/759629_design_options_paper.pdf [Accessed: 02/11/2019].

Today Economia (2019). Consumi fermi e tagli su vestiti e scarpe: come (non) spendono le famiglie. Available at: https://www.today.it/economia/spesa-famiglie-2018.html [Accessed: 15/01/2020].

APPENDICES

This section presents the appendices:

- *Appendix A*: it refers to the first step of the research (**qualitative research**, see *Chapter 4*). It concerns the questionnaire submitted to the companies.

- *Appendix B*: it refers to the first step of the research (**qualitative research**, see *Chapter 5*). It concerns the topics discussed with the CEO of the company analysed during the in-depth interviews.

- *Appendix C*: it refers to the second step of the research (**quantitative research**, see *Chapter 6*). It concerns the questionnaire distributed to consumers.

- *Appendix D*: it refers to the second step of the research (**quantitative research**, see *Chapter 6*). It concerns the variables used in the study, along with their indicators and references.

APPENDIX A

SECTION 1: GENERAL INFORMATION ABOUT THE COMPANY

1. Business Name
2. Position held
3. Headquarter
4. Reference markets
5. Product typology
6. Number of workers (31/12/2018)
7. Income (31/12/2018)
8. Geographical distribution of sales in the relevant markets
9. Identify the communication tools, among those indicated below, used by the company to interact with both the Italian and foreign markets
   - ☐ Printed catalogues and brochures
   - ☐ Mass-media advertising (TV, radio, press, etc.)
   - ☐ Public relation activities
   - ☐ Communication from Sales Staff
   - ☐ Promotional activities (discounts, price concessions, etc.)
   - ☐ Company's website
   - ☐ Presence on social media platforms
   - ☐ Web marketing campaigns
   - ☐ Newsletters
   - ☐ Promotional activities at store level (merchandising, management of the store atmosphere, in-store events, …)
   - ☐ Digital activities at store level (e.g. qr code, augmented reality vision devices, …)
   - ☐ Participation at sectoral fairs
   - ☐ Storytelling
   - ☐ Other
10. In your opinion, what factors can help strengthen the presence of the company in foreign markets?

Use of Italian raw materials	1	2	3	4	5
High quality details and finishes					
Craftmanship in manufacturing processes					
Possibility to customize products					
"Made in Italy" brand presence					
Extensive local distribution					

Adequate management at store level					
Pre and after sales services provided to customers					
Financial investments in sustainability projects/activities					
Cost benefits for companies					
Price benefits for consumers					
Other					

SECTION 2: PERCEPTION AND APPROACH TO SUSTAINABILITY AND CIRCULAR ECNOMY ISSUES, IMPLEMENTED PRACTICES, ENABLING AND HINDERING FACTORS

11. Are you aware of the topic of the circular economy?
12. Is the company currently involved in participation in regional/state/European projects that address the circular economy topic? (If yes, please specify the project).
13. Which of the following sustainable practices is the company actually implementing?

	1	2	3	4	5
Reduction of raw materials per unit product					
Overall reduction of raw materials and energy					
Use of renewable energies					
Initiatives for enhancing the energy efficiency of production equipment					
Re-use of product packaging materials					
Re-use of equipment cleaning materials					
Re-use of leftover material to manufacture other products					
Recycle of waste generated in the production processes					
Recycle of consumer-generated waste (e.g., discarded products, returns, etc.)					
Re-processing of waste and garbage					
Use of waste and scrap to manufacture new products					

14. By considering the same list of activities outlined in the previous question, what sustainability practices is the company planning to implement in the future?
15. What are the main motivations that pushed/will push the company towards the adoption of the above sustainable practices?

	1	2	3	4	5
Reduction of environmental impact of manufacturing processes					
Reduction of risks related to the dependence on raw materials					
Gaining a competitive advantage compared to competitors					
Greater possibilities to obtain public funding					
Reduction of the total amount of costs, thus enhancing energy efficiency					
Improve people and workers' health conditions					
Increase the total amount of sales, especially among consumers aware of sustainability and related issues					
New professional figures to be created and reduction of the unemployment rate					
Other					

16. What factors encouraged/will encourage the adoption of sustainability practices within the company?

	1	2	3	4	5
Fiscal and economic incentives for investments in R&D					
Efficient differentiated waste collection system					
Possible use of artificial intelligence systems in production/distribution processes					
Adequate degree of awareness about environmental issues among consumers					
Other					

17. To what extent do you perceive that the following circumstances hindered/might hinder the implementation of sustainability practices?

	1	2	3	4	5
Difficulties related to the type of material used in manufacturing processes					
Difficulties related to final products					
Lack of financial resources for R&D investments					
Unexpensive waste disposal processes					
Inefficient waste collection system					
Other					

18. Which of the following practices does the company use to communicate the adoption of sustainability practices to its stakeholders?

	1	2	3	4	5
Drafting of Sustainability Budget					
Product label information					
Product packaging information					
Participation at sectoral fairs					
Participation at workshops and events with reference to sustainability and related issues					
Use of the company's website (for publicising information related to product and process certifications, environmental and energetic management systems, etc.)					
Use of social network					
Participation in forums, blogs, communities, online discussion groups related to sustainability issues					
Collaboration with Universities, Research Centres in order to realise/develop projects related to circular economy and sustainability issues					
Use of companies' catalogues/product brochures and instruction manuals					
Periodic publications on dedicated magazines					
Mass-media advertising (TV, radio, press, etc.)					
Periodic reports and bulletins that analyse/certify environmental ratings, compliance with certifications, etc.					
Other					

SECTION 3: ADOPTION OF ENVIRONMENTAL AND SUSTAINABLE CERTIFICATIONS

19. Does the company adhere to a product system certification for its products (e.g.: Ecolabel, FSC, Ecological Panel, etc.)?

    - ☐ Yes
    - ☐ No, but we are interested in doing so in the future
    - ☐ No and we are not interested in doing so in the future

19a. If yes, please indicate what are the product certifications adopted by the company.

20. Does the company adhere to a process certification system for its processes (Es.: ISO 9001, ISO 14001, etc.)?

    - ☐ Yes
    - ☐ No, but we are interested in doing so in the future
    - ☐ No and we are not interested in doing so in the future

20a. If yes, please indicate what are the process certifications adopted by the company.

21. What are the main motivations that pushed/will push the company towards the adoption of product/process certification systems?

	1	2	3	4	5
Reduction of the total amount of costs					
Achievement of high-quality standards compared with competitors' ones					
More effective monitoring of manufacturing processes in order to improve their efficiency					
Increasing customers' loyalty to the brand					
Possibility of entering new markets					
Improving corporate image					
Improving workers' safety at workplaces					
Compliance with environmental legal standards					
Developing a socially sustainable strategy					
Possibility of using funding from national/international public authorities					

APPENDIX B

SECTION 1: GENERAL INFORMATION ABOUT THE COMPANY

1. Business name
2. Brief history of the company (birth, milestones, etc.)
3. Product typology
4. Description of the company (organisational structure)
5. Composition of the reference markets
6. Income (last available result)
7. Number of workers (last available result)

SECTION 2: INFORMATION ABOUT INNOVATION ACTIVITIES

8. Conception of design
9. Description of the most famous product innovations
10. Role of the technology in manufacturing processes
11. Role of the owner in the development of innovation
12. Description of the main internal/external factors underlying the success of the above innovation

SECTION 3: INFORMATION ABOUT COMPANYS' APPROACH TOWARDS ENVIRONMENTAL AND SUSTAINBILITY ISSUES

13. Origins and motivations about environmental issues of the company
14. What activities/tools is the company implementing to improve its environmental performance?
15. Description of the main factors that facilitate/hinder the adoption of sustainable practices
16. What other activities, if any, has the company planned to implement to improve its environmental performance?

SECTION 4: INFORMATION ABOUT THE DEVELOPMENT AND REALISATION OF AN ECO-DESIGN INNOVATION

17. History and description of an eco-design innovation recently developed
18. Description of factors (internal and external) that facilitated its development
19. Description of factors (internal and external) that hindered its development
20. What, if any, difficulties have there been in implementing this innovation?
21. Why do you refer to this design innovation as an eco-design innovation?
22. Description of the role of the owner in every single phase of its practical development

23. What are the main implications for the market that this innovation has enabled to obtain?

APPENDIX C

SECTION 1: SOCIO-DEMOGRAPHIC INFORMATION

1. Gender:
   - ☐ Male
   - ☐ Female
2. Age group:
   - ☐ 18-24
   - ☐ 25-34
   - ☐ 35-44
   - ☐ 45-54
   - ☐ 55-64
   - ☐ > 65
3. Area of Residence (ISTAT):
   - ☐ Northern Italy
   - ☐ Central Italy
   - ☐ Southern Italy
4. Education:
   - ☐ Junior certificate
   - ☐ Baccalaureate
   - ☐ Bachelor's degree
   - ☐ Master's degree
   - ☐ Ph.D./Master
5. Occupation
   - ☐ Student
   - ☐ Worker
   - ☐ Freelance
   - ☐ Unemployed
6. Marital status
   - ☐ Unmarried/single
   - ☐ Unmarried partner
   - ☐ Conjugated
7. Housing status:
   - ☐ Live in a rented house

- Live in a house I own
- Share the house with parents and brothers/sisters
- Share the house with husband/wife and children
- Share the house with friends/other students
- Other

SECTION 2: THE CONCEPT OF DESIGN AND ITS CHANNELS OF INFLUENCE

8. The home is the place to be oneself, rich in values and meanings. With regards to the furniture items, how would you define an object with a strong design content?

	1	2	3	4	5	6	7
It meets a specific functional purpose							
It meets a specific hedonistic purpose							
I understand how to use it							
It is pretty							
It is my style							
It does not break easily							
It has a positive impact on the environment							
It is a creative object							
It is comfortable							
I hope to use the same object in the future							
It is perceived as something different from what was expected							
It provides me to social status with respect to others							
It offers me something different than other products in the same category							

9. How many times do you intend to purchase a design furniture product in the next future?

1	2	3	4	5	6	7
○	○	○	○	○	○	○

10. What channels do you use most to draw inspiration when choosing design furniture products?
    - Mass media (TV, radio, etc.)
    - Word of mouth (parents, friends, etc.)
    - Professional (architect, interior designers, etc.)
    - Trade magazines
    - Furniture stores (mass distribution/retail outlets)
    - Web searches (furniture companies' websites, online trade magazines, etc.)
    - Social media and dedicated community
    - Price comparison websites and opinions
    - Other

SECTION 3: ENVIRONMENTAL CONCERNS AND PURCHASING INTENTION

11. When you are going to choose a design furniture product, how much importance do you give to environmental issues?

1	2	3	4	5	6	7
○	○	○	○	○	○	○

12. Whose of the following environmental certifications do you know?

- ☐ Ecolabel
- ☐ FSC
- ☐ Ecological Panel
- ☐ ISO 9001
- ☐ ISO 14001
- ☐ Other

13. What are the main reasons for buying design furniture products with quality certifications?

	1	2	3	4	5	6	7
My actions impact the health of the environment							
I have the power to protect the environment							
I can learn how to improve the environment							
I will work to make my surrounding environment a better place							
Other							

14. If environmental certification will be on design furniture products, what will you think?

	1	2	3	4	5	6	7
I would rather buy certified design furniture products rather than similar, non-certified ones.							
I would recommend to others to buy certified design furniture products							
I will buy certified design furniture products							

APPENDIX D

Variables, indicators and references

Construct	*ID-Item*	*Item description*	*Main references*
Purchasing Intention	PI	How many times do you intend to purchase a design furniture product in the next future?	Kamins and Gupta, 1994; Pradhan et al., 2014
Design	DES_FUNCNEED	It meets a specific functional purpose	Arboleda and Alonso (2014)
	DES_HEDONEED	It meets a specific hedonistic purpose	
	DES_EASYUSE	I understand how to use it	
	DES_NICESEE	It is pretty	
	DES_MYSTYLE	It is my style	
	DES_NOTBREAK	It does not break easily	
	DES_ENV	It has a positive impact on the environment	
	DES_CREATIVE	It is a creative object	
	DES_COMFORT	It is comfortable	
	DES_NOTIME	I hope to use the same object in the future	
	DES_UNUSUAL	It is perceived as something different from what was expected	
	DES_SOCSTATUS	It provides me to social status with respect to others	
	DES_ADDVALUE	It offers me something different than other products in the same category	
Environmental concern	CEC	When you are going to choose a furniture item, how much importance do you give to environmental issues?	Echavarren, 2017