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Family Business's Transitioning to Circular Economy Model: The Case of "Mercadona"

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Abstract

Sustainability addresses environmental and social issues affecting this and future generations. When family businesses perceive that the community is disrupted, recognizes an environmental problem and responds by implementing new environmental policies or regulations. The family business's socio-emotional values press to transition to a more sustainable production system, such as the circular Economy. Drawing on the Dubin (1978) methodology, we design a sustainable model, which shows family businesses' response to changes in the environment. It explains the reasons why family businesses transition to Circular Economy, based on the theory of Socio-Emotional Wealth. We check the model through the case study of the food retail leader in Spanish market, Mercadona that applies policies about energy, resources and waste to became a circular economy business model.

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Keywords: circular economy; sustainability; family business; model; case study; mercadona

1. INTRODUCTION

Sustainability addresses environmental and socioeconomic issues affecting this and future generations [1], [2]. It understands the world as a complex interaction between economic, social, environmental, and political systems. Management of the environment has been viewed as a determinant of business success [3], [4], [5], [6],[7], [8], [9]. Family business researchers must take environmental issues into consideration, as they are increasingly important, especially since the development of theories such as functionality, ecology, and development, which incorporate the lens of sustainability [10].

Although an ethical or normative view of the world urges us to embrace a holistic view of what a good society should be [11], [12], global concerns have been raised about environmental issues. While economic sustainability has been defined as maintenance of capital [13]), environmental sustainability seeks to improve human welfare and social sustainability by protecting the sources of raw materials used for human needs and limiting dumping of human wastes in order to prevent harm to human beings [14]. The literature on family business and sustainability has increased in recent years [15], [16], with family business researchers studying sustainability and environmental issues in depth. Stafford et al. (1999) proposed one of the first business models to apply the idea of sustainability to family businesses, grounding the latter's sustainability in systems theory by analyzing the interactions between business and family as two subsystems. Analysis cannot, however, be limited to internal links between the family and the company. Family business studies have gradually highlighted the importance of analyzing the relationships between companies and their stakeholders, defined by Freeman [17] as groups or individuals who can affect or be affected by achievement of a corporations' purpose. Since the community is a major stakeholder, and one permanently related to the firm, we must analyze the characteristics of this relationship.

Despite these studies, researchers highlight the scarcity of research on sustainability, noting that few studies of sustainability consider factors other than

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financial performance. One exception is the study by De Geus [18], which included eco-emotional factors such as desire to survive, withstanding changes inherent in the environment.

Among attempts to achieve environmental sustainability, the Circular Economy (CE) has been promoted by the Ellen MacArthur Foundation (EMF) as a way for companies to respond to contemporary environmental challenges. The EMF was established to champion a notion of CE to oppose the dominant economic paradigm of "Linear Economy" (LE). According to [19], CE is "an industrial economy that is restorative or regenerative by intention and design." Although CE is an important paradigm, little research analyzes the position of family business relative to sustainability and CE. We undertake this study to fill this gap. Our research goal is thus to determine the situation of family businesses relative to environmental sustainability by analyzing how their unique characteristics could affect implementation of CE using the SEW approach. Specifically, our research questions are:

RQ_1. What reasons could lead a family business to evolve to the CE model?
RQ_2, What factors inherent in the family, aid implementation of the CE model?
RQ_3. How Family businesses companies are transitioning to CE in the practice?

Our main contribution is to advance traditional sustainable models of family business by studying the behavior of family and business facing the CE. We also aim to identify what factors derived from family character could speed transition to this economic model. This is the first model applied to the family business that introduces the concept of environmental sustainability through CE. We also seek to introduce the new paradigm to family business decision makers. This knowledge will help to build collective awareness of sustainability matters in the family business, and thus to promote a new business model based on CE.

2. THEORETICAL FRAMEWORK

2.1 Key concepts of CE

The concept of CE was introduced by Pearce and Turner [20], who proposed a closed circuit of material flows within an economy. The idea was developed by analyzing the relationships between economic and natural systems [21]. CE is a model of economic development supported by the principles of "reduce, reuse and recycle"

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[22], [23]. It aims to protect the environment and prevent negative externalities such as pollution, thus facilitating sustainable economic development [24]. Many studies show that the development of CE is important to mitigating environmental impacts at the source and to reducing overall waste and resource consumption per unit of output by saving, reusing, and recycling resources [25]. The CE approach fits well with the future management of global resources, as it supports preservation of virgin resources, optimizing their yields through manufacture of more reusable products and lower generation of waste. In fact, the idea is to repair the goods during their lifetime and completely reuse what is available of them at the end of that life in order to close the loop [26].

We defined CE within our iteratively developed coding framework as an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations

Care of resources: 3R´s, reducer reuser and recycling, service, reverse logistics, and C2C

According to [27], "In the past, reuse and service-life extension were often strategies in situations of scarcity or poverty ... Today, they are signs of good resource husbandry and smart management." One element of such management, Product as a Service or PSS, is a specific type of value proposition that a business offers to its customers [28]. One sells use of the products but not the material. One goal of CE is thus that the customer merely uses the product, while the supplier is responsible for recycling it. Customers purchase use as a service; when the product becomes obsolete, it is recovered and renewed. The design process must manage concepts such as modularity, versatility, and adaptability, the most important properties in a changing world. [29] identified the benefits of PSS in terms of sustainability and resource efficiency. Further, reuse and remanufacture are symbols of good management that help to reduce pressure on the global stock of resources [30].

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Another key aspect of Circular economy is reverse logistics, including reverse supply chain management (SCM). Reverse logistics is the process of planning, implementing, and controlling efficient, effective inbound flow, inspection, and disposition of returned products and related information for the purpose of recovering value [31]. A supply chain is composed of all parties involved directly or indirectly in satisfying a customer's request of all parties—both internal and external—involved. The orthodox supply chain includes supplier, manufacturer, stockiest (both wholesale and retail) and even the customers themselves. There are several reasons for focusing on the reverse logistic, especially on the reverse supply chain. In many cases, the main factor is concern for the natural environment and environmental regulations [32], [33]. In most supply chains, value correlates with profitability. Environmental SCM incorporates other principles, however, such as waste reduction, focus on processes, and involvement of people in the management system [34]. A reverse logistic includes: product acquisition, returned product transport, inspection and disposition, remanufacturing, and distribution and sales [32]. A family firm must thus be proactive in design and implementation of a reverse supply chain, also helping stakeholders to meet their environmental objectives, enabling the customer to return the product at the end of its useful life [35].

Reduction of environmental impact and negative externalities

As companies have numerous unsustainable practices [15], the aim of CE is to solve these environmental cost problems. Any production system must manage its production inefficiencies to prevent or diminish environmental damage. All such damages are termed "negative externalities," originating in decisions related to consumption, production, exchange of inputs/productive factors, and investment. By reducing negative externalities, family companies will diminish their environmental impact and thus survive—their long-term goal [15].

Previous analyses of family business sustainability models [36] observe that generation of waste and by-products, and emission of polluting gases that damage ecosystem and the environment have not been classified as negative externalities and valued less in economic terms. A new advanced model of sustainable family business should measure these externalities and indicators of sustainable practices.

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We must thus consider generation of environmental damages derived from design and production of goods and services as a negative externality, generating a series of indirect costs that have not been measured to date in sustainability models. Our model raises the need for decision-makers in the family business to make decisions designed to mitigate these externalities. The transition to CE will help to reduce these negative effects [37].

2.3 SEW theory

Within the SEW framework developed by [38], family businesses could behave differently from non-family businesses because non-economic factors dominate family firms' business decisions—and for three reasons. Firstly, emotions are important in family-business relationships. Secondly, the family's own values, such as collectivism and feelings of responsibility, condition its behavior [39], [40], [41], commitment [42], and perpetuation [43]. These values align with ideas of SEW [39]. Thirdly, altruism motivates family businesses, which are generally immersed in their community, to protect their image and reputation. The long-term, trans-generational perspective family firms pursue foster a strong desire to guard and protect the corporate reputation. Most family business decisions tend to preserve and enhance the family's SEW [44]. For instance, family businesses pollute less even when more environmentally friendly practices increase costs [45]. In contrast with non-family firms, family businesses also vary in their behavioral response to an environmental jolt [46]. Since SEW is a key factor distinguishing family firms from other types [45], [47], we can expect family businesses to behave differently when facing environmental sustainability.

According to Debicki et al [47], SEW is composed of three main dimensions: The first is *family prominence*, or the importance of how the family as business owner is perceived by the community. It includes issues such as concern for corporate reputation, which could drive adoption of more environmentally sustainable practices [48] because the firm seeks a favorable organizational reputation [49]. Since families also pursue nonfinancial goals in order to guarantee transgenerational sustainability, they will invest in proactive environmental practices [45]. Beyond these issues, a family firm could act heterogeneously, as Reay et al. [50] argue. Family firms (lifestyle and traditional) can act to rearrange field-level logic and change the "rules of the game" to ensure their legitimacy and sustainability. A second dimension of SEW is *family continuity*, which represents the importance of making decisions based on sustainability of family

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business and desire to maintain family ownership and management Finally, *family enrichment* indicates the significance of the desire to maintain family harmony through altruistic behavior, a distinctive characteristic of family-owned companies [40], [51].

3. MODEL OF TRANSITION TO CIRCULAR ECONOMY FOR FAMILY BUSINESS

3.1. Methods

We ground the theoretical model in Dubin's theory-building model, based on the functionalist paradigm, to build the model through deduction. Performing the literature review and operating with selected variables, we build a theory by incremental extension of previous models [52].

Following Dubin's methodology, we performed a review of literature in databases and journals to understand phenomena and concept development, and to identify previous models and key aspects of our study. We then developed construct analysis and the iterations between these constructs. This procedure established three main constructs: Community, Family, and Business. We highlight the interactions between these three constructs, attempting to build our theory according to the five steps established by [53]: determination of the units of a theory to study the relation between family business and CE; laws of the interactions between units; boundaries of the theory; system states; and establishment of propositions. Following this method, we developed an initial theory—a set of propositions that aim to explain the position of the family business facing CE.

3.2 Dimensions of the model: Community, family, and business

Community, defined as a dynamic system that is continuously created and recreated. Community offers resources, institutions, cultural values, attitudes, beliefs, and practices that can be tapped to achieve the objectives [54], [55]. Long-lived family firms gain from ongoing engagement with the local community because these connections enhance their SEW [56]. Community is the affected by the negative externalities of business and the lack of resources and increased level of resource consumption facing society and the manufacturing industry [19].

The *family* is the owner of the company and wishes to preserve SEW by acting with social responsibility, as this behavior will generate social recognition, improving both

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economic and non-economic performance derived from adopting more environmentally respectful practices [48].

The *business* is the productive, economic, and financial unit. Family and business interact each with other and, simultaneously, with the community. Family and business respond both in regular patterns and separately to disruptions [57].

3.3 Interactions between dimensions: Community and Family business.

The community enacts different standards and legal regulations on environment, which the family business recognizes (outputs of the model). Ward [58] stresses that long-term sustainability is conditioned by the firm's ability to respond to change. When a disruption occurs, new patterns are needed to maintain the firm's market position [57]. Environmental sustainability thus involves facing disruptions and making decisions in response to those previously emitted by the community. Regulatory changes create disruption, affecting family business strategy.

3.4 Family and Business: Influence on business transition.

The transformation to CE is thus unavoidable, and the only issue is the time line of this change. From a SEW perspective, family firms may be considered as close to their communities, due to the personal ties between family members and other community members [45]; [44]. SEW of family business mediates that influence on the speed of transition to CE. Based on SEW, this response could be speeded by three features of family business that act as triggers. Firstly, *Family prominence* will lead the family to answer to disruptions of the community, seeking community recognition, caring for its reputation, and preserving social capital [38]. Secondly, *Family continuity* plays a role because factors of environmental and social responsibility become disruptions when the company and/or family recognize the need to ensure the company's long-term sustainability, preserving the dynasty in the business [46]. 3º. *Family enrichment*, which includes family enrichment and business enhancement through the entrepreneurial opportunities that the community provides for the company.

3.5 System states / Boundaries

The three system states proposed are: *Families with a high degree of SEW*. In this state, the model will be highly operative, driving the family's efficient adoption of CE principles. In the second state, *a moderate degree of SEW*, family influence is lower

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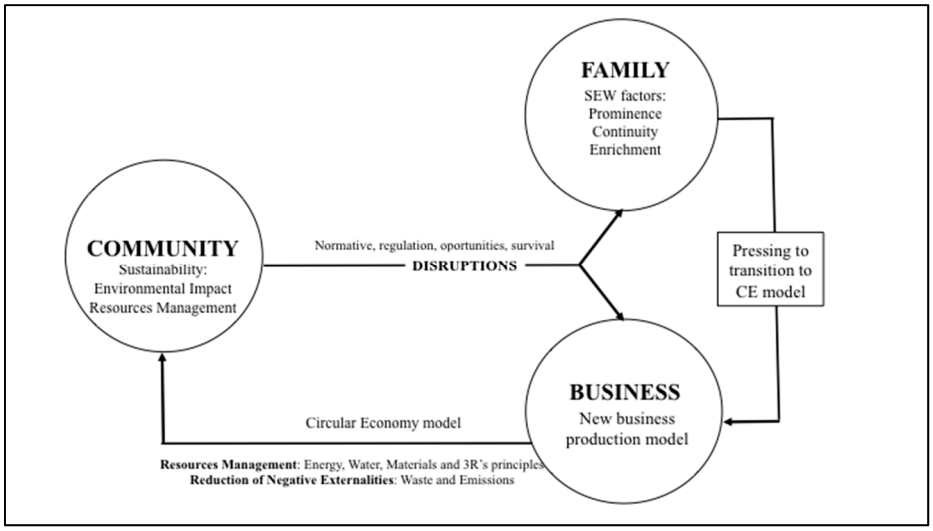
than in the previous model, and the system operates moderately effectively. Finally, the third system state involves *a low degree of SEW*. In this case, the values of the units of support provide low effectiveness for the behavior of the whole model.

Boundaries. A theoretical model is bounded when the values limiting the units composing the models are known. The main boundary of the model is generated by the definition of family business. This theory has been developed specifically for family-owned companies. The parameters that establish the model's boundaries are adopted from the definition of family business by the European Group of Family Companies: firms in which the family controls ownership of the company, with influence in decisions and participation in its management.

In a theoretical model like the one we construct here, a proposition is an assertion about the model in operation [53]; [60]. Propositions are based on the explanatory and predictive capacity incorporated into the theoretical framework generated during theory development [59]. The indicators must first be converted into empirical data and then transformed into hypotheses. The hypotheses are then been tested through research linking the theory to the real world. [53] observed that propositions do not imply empirical accuracy but will be accurate if logically derived from the theoretical framework.

The figure 1 shows the model proposed.

Figure 1: Transition of Family Business to CE



Source: Developed by the authors

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4. APPLICATION OF THE MODEL TO THE MERCADONA CASE

Once the model of transition to a circular economy has been developed, we will proceed to test it by studying the case of the Spanish retail market leader, Mercadona. This study aims to evaluate the model in order to verify if the exposed factors contribute to accelerate the transition towards the production model based on the circular economy.

4.1 Methodology.

To measure the applicability of the model, various information from the Mercadona company have been analysed. Thus, following the methodology of Campopiano and De Massis (2015), we collected relevant information related to the principles we have developed in the theoretical framework from the company. Table 1 shows the analysed documents from the Mercadona family business. In addition, we also collected relevant information from secondary sources such as their websites, social media and news (Esrock & Leichty, 1998; Maignan & Ralston, 2002).

Table 1: Material analyzed for the case study

Environmental report of the company 2016-2015
Environmental report of the company 2013-2014
Environmental report of the company 2011-2012
Environmental report of the company 2010
Annual report of the company 2011-2016
Progress reports sent to the World Pact 2010-2016
Balances and annual accounts Perriod 2011-2016

Besides, secondary information was collected from its corporate website, from which we have been able to understand the business models followed by the company and study the environment of the company and the sector. Afterwards, the content analysis has been combined with the financial information obtained from the Sabi database during the period 2011–2016.

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4.2. Choice of case study. Mercadona, a family company leader in the Spanish retail sector.

Mercadona is a Spanish supermarket company, with family capital that ended the year 2016 with a turnover of 21,623 million euros (+ 4%) and a profit of 636 million euros (+ 4%). Currently, Mercadona has 1,620 supermarkets in Spain and a workforce of 79,000 people. This company was chosen for this case study because of its family nature, its leadership position in the Spanish retail market, and finally, the availability of information regarding the circular economy. Moreover, it has a particular position facing sustainability and social responsibility (Mercader-Meleá et al., 2014).

Mercadona started reporting about the circular economy early, thus, in its environmental report of 2011–2012, the company mentioned the commitment of the company in this matter. Table 2 briefly shows the main data in its economic and financial structure.

Table 2: Economic-financial profile of the Mercadona company

Concept	2016	2015	2014	2013	2012
Operating income	19.823.515	19.077.481	18.458.967	18.062.450	17.552.041
Result ordinary before Tax	802.912	810.265	737.915	717.595	710.215
Result	636.260	611.345	543.259	515.324	508.441
Total Active	8.194.637	7.660.114	7.060.386	6.517.333	6.281.938
Own funds	4.911.843	4.392.263	3.884.206	3.438.110	3.019.232
Economic profitability (%)	9.80	10.58	10.45	11.01	11.31
Financial profit (%)	16.35	18.45	19.00	20.87	23.52
General liquidity	1.33	1.29	1.19	1.13	1.09
Indebtedness (%)	40.06	42.66	44.99	47.25	51.94
Number of employees	79.563	75.381	74.228	74.082	71.333

Source: Author´s elaborationfrom Annual sustainability reports 2011-2016

4.3. Disruptions to and drivers of the transition to the circular economy in the Mercadona company

Our model started highlighting that the community emitted disruptions in the form of events that the company has received either internally or externally from the owning family or firm system, which significantly challenged the stock of capital and

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routine management practices of the family firm (Stafford, Danes and Haynes, 2013). The international normative about environment, Spanish legislation and the community's requirement for the producer to manage the business in a more sustainable model are the main disruptions that affect Mercadona's decision to transition to the circular economy.

Our proposed model established that three factors derived from socio-emotional theory [47] as the drivers of the transition to the circular economy model. We have individually analysed each of them to see if they are present in the company being studied.

The first factor is *Prominence*. This includes as main exponent, the concern of the company for its reputation. From the analysed information from the Mercadona case, we observed that the company strives to improve its reputation before the society. Thus, the firm has received numerous awards for its sustainable attitude. For instance, in the environmental sustainability report of 2015–2016 (pg. 42) stated.

> *"The adhesion of the company to commitments and events such as the European Distribution Fund for sustainability, the Global Compact as well as other associations. Mercadona is recognized as the 1st company in the Generalist Distribution sector in Spain and the 2nd company with the best reputation in Spain in the "General Business Ranking 2017" of the Spanish Corporate Reputation Monitor (MERCO)".*

Therefore, we observed the presence of prominence and values related to this dimension not only for reputation but also for its transgenerational sustainability.

The second factor is *Continuity*. The company bet, without doubts, for a policy of continuity, maintaining that the family management of the company was proof of the composition of the social capital. According to the balance sheets for the financial year 2011 to 2016 (Table 3), the company presented a situation of absolute control by the family.

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Table 3: Company property profile

	2016	2015	2014	2013	2012	2011
Own funds	**4.911.843**	**4.392.263**	**3.884.206**	**3.438.110**	**3.019.232**	**2.672.886**
Fixed liability	91.743	106.888	135.498	185.801	223.051	253.263
Liquid liabilities	3.191.051	3.160.963	3.040.682	2.893.422	3.039.655	2.862.144
External Funds	**5.003.586**	**4.499.151**	**4.019.704**	**3.623.911**	**3.242.283**	**2.926.149**
Total funds	**9.915.429**	**8.891.414**	**7.903.910**	**7.062.021**	**6.261.515**	**5.599.035**
Own / Total Ratio	50%	49%	49%	49%	48%	48%
Ratio Family property	92.7%					

Source: Author´s elaboration from Annual sustainability reports 2011-2016

The capital was distributed as follows: 92.7% was owned by the Roig family and 7.3% was owned by a minority shareholder, who was a board member of the company. Therefore, we observed a high degree of concentration of capital in the hands of the family. In addition, the company bought owned shares of 2.3% of the capital from one of the partners, with the intention of maintaining the capital of Mercadona within the family.

On the other hand, the company is not listed on the stock market and does not allow the entry of capital other than from the family. This way, the aim is to preserve that family character in the future and ensure transgenerational sustainability, as reinforced by Juan Roig, president of the company, who stated:

> *"I will continue to carry Mercadona. I feel very good. The successor will be one of my four daughters and directors. I have a few in my head. But today I find myself with the strength to continue leading the company".*

Finally, the third factor is *enrichment.* The company bases a good part of its harmony on ethical behaviour towards capital. The president argued that under the total quality management model, it is also just the satisfaction of the needs of the last component of the company, the capital i.e. of those people and entities that invested their money in the company by contributing economic resources. This circumstance also makes the company present a clear orientation towards the maximization of results to satisfy the wishes and needs of its shareholders. In this sense, the company's management model seeks for its shareholders to obtain a series of advantages that are considered valuable, such as profitability, stability, security and maximum risk

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reduction of their investment. According to the annual report of 2016, the shareholders received 10% of the total profits as a dividend. This policy of dividend distribution favours harmony within the family. With regards to its altruistic behaviour, the company has established a broad social action plan detailed in the 2016 report.

4.4 Resource and Waste management

So, once the family perceived the disruptions omitted by the community, its socio emotional values, prominence, continuity and enrichment (Debicki et al. 2016) prompted its transition to the circular economy model, improving the resources management and diminishing the negative externalities of the company.

Mercadona has been promoting the circular economy strategy for years to optimize the use of natural resources, based on the premise of converting waste into resources. The company has promoted circular economy between its suppliers, creating a model that included the whole supply chain of management of the company. Thus the 2011 report stated: Waste management offered

> *"Valuable resources for other processes and, based on the premise of the Circular Economy of "Convert waste in resources", some of Mercadona's integrated suppliers have developed innovative processes to take advantage of waste coming from other processes of the agri-food chain. This allows it to take advantage of some waste from its processes, which it converts into resources to reincorporate them into the productive economy cycle and, thereby, reduce the environmental impact of its activity."*

The Mercadona model required that the facilities of its integrated suppliers have internationally recognized environmental certifications (ISO 14001, EMAS ...) to accredit their good practices in this field. Currently, 90% provided by the facilities of Mercadona's integrated suppliers have some environmental certification. The rest are facilities corresponding to new factories or locations in the process of gaining ISO certification.

So, the company has been implementing, in collaboration with the internal suppliers, new production systems based on the circular economy from 2011; "the company works to build a virtuous circle in which waste is treated to recover raw materials that finally, they become new products".

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In this innovator system, Mercadona exerted a nexus position in the SCM that invited collaboration from the 2,000 suppliers of the same, so that the waste generated in one activity served as a nutrient for another. Once the products are manufactured, the waste is treated by cleaning, purifying or refining it with the objective that they can be reused as raw material, which may imply an important investment by the integrated supplier that assumes this commitment. Once the waste has been properly treated, raw material suitable to be part of a new production process is obtained. The waste, therefore, again becomes a valuable resource. The circular economy finishes its cycle when the products made from the raw materials recovered return to the store shelves. The company offers examples of these inter change between suppliers. Figure 1 shows the circular economy in the SCM model of Mercadona, and Table 4 shows several examples of these practices used by the company to transition to a CE production model.

Figure 1: CE intra suppliers of the SCM Mercadona

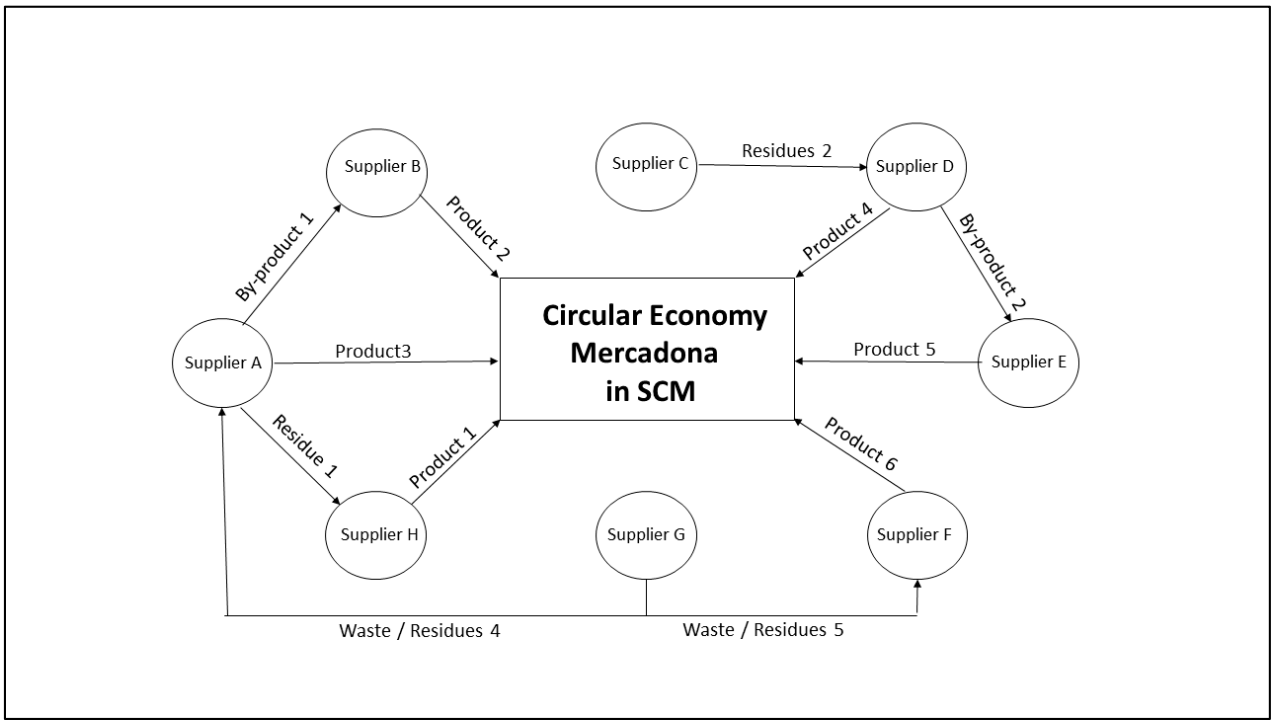

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Table 4. Example of waste management based on circular economy applied by mercadona and suppliers

Reuse: Pool of reusable containers (Logifruit). It is a closed cycle in which the transport and storage of the merchandise takes place in reusable boxes that are washed and recovered over many cycles of use. The broken boxes are reused to make more boxes and plastic pallets, closing the cycle.
Waste: Recovery of flours for feed. Grupo Siro, an integrated supplier of Mercadona, values the by-products of its plants, where Hacendado products are manufactured, and converts them into raw materials for animal feed, saving resources and reducing waste in the agri-food chain.
Waste: Recovery of plastic (Sp-Berner). In 2011 Mercadona reached the line of the new range of household cleaning manufactured from plastic waste generated at Mercadona and other integrated suppliers. The process has been developed by Sp-Berner.
Residues: Use of by-products for animal feed, either directly or for the production of feed
Recycling: Use of recycled packaging material in the preparation of new packaging, and of complete product lines (such as the Greenwood cleaning household line)
Waste: Use of the byproducts from the ham process of sliced Trévelez to make sausages
Reuse: Use of surplus fruit for the production of juices, nectars and concentrates
Reuse: 100% use of pruning waste as fertilizer
Waste: Utilization of 100% of land from the washing of fruits and vegetables to recover agricultural parcels
Logistic: Seprolesa, integrated supplier of packaged legumes, has lightened 25 gr. glass containers (9%), achieving savings of more than 1,300 tons. In addition, it has implemented process improvements that have saved 117 Tons of cardboard and more than 100,000 cubic meters of water per year.
Residues: The vegetable supplier has implemented measures of circular economy that allow products not suitable for processing such as courgettes and cucumbers can be used by Dafsa, another integrated supplier that produces juice and gazpachos for Mercadona, getting a great use of agricultural production. It has also incorporated water saving measures in its plants, channeling rainwater for irrigation and thus saving more than 220,000 m3 per year.
Logistic: Saplex, which manufactures among other products the garbage bags Bosque Verde, has reduced the thickness of many of its products and has improved stacking to increase the number of units per box. This has allowed to save more than 160 tons of polyethylene per year and to transport the same amount of product using 95 less pallets.
Reduce: The SPB cleaning products supplier has made an ambitious commitment to ecodesign by changing HDPE bottles to PET, and reducing their weight. That's how he got reduce 32 tons of plastic, to which is added the saving of more than 2,000 m3 of water, thanks to the reuse of its process waters.
Energy efficient: Caladero, a fish supplier, has introduced reusable industrial packaging in its process and has improved the ecodesign of 14 references that have saved 28 tons of packaging material. In addition, its different energy efficiency measures have allowed annual savings of more than 600,000 kWh.
Energy efficient: This interprovider of fruits destines to animal feeding the 1,100 Tons / year of the subproduct that it generates in the preparation of the natural peeled pineapple. In addition, it has saved 33,000 kWh with energy efficiency measures such as the installation of LEDs and improvements in insulation.

Source: Author´s elaborationfrom Annual sustainability reports 2011-2016

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The 2016 sustainability report of the company states:

> *"Waste management is acquiring a growing role as they begin to develop and implement new techniques to convert waste into resources. An efficient waste management strategy should be based on prevention, but in addition there are ways of reincorporating waste to the productive economy, as raw material in other processes".*

The company employed several strategies to prevent waste generation, such as eco-design or prevention of food waste. This way, the farmers who supplied products to Mercadona, recovered a large amount of plastic materials that, far from seeing them as unusable waste, are considered resources and serve as raw material for the production of products. Table 5 shows the main data about waste, while Table 6 contains the recycling information.

Table 5: Waste generation

Year	**% Waste / kg sold**	**Waste of maintenance** g/m^3	**Cardboard** (kg/m^3)	Plastic (kg/m^3)	**Poliexpan** (kg/m^3)	**Wood** (kg/m^3)
2016	0.75	22	5.46	0.37	0.04	0.05
2015	0.67	24	5.32	0.37	0.05	0.08
2014	0.8	10	5.28	0.36	0.07	0.05
2013	0.72	10	5.17	0.34	0.05	0.06
2012	0.71	16	5.08	0.31	0.04	0.09
2011	0.7	15	5.41	0.29	0.04	0.06

Source: Annual sustainability reports 2011-2016

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Table 6: Recycling of waste (tons of recovered products)

Year	CardBoard (Tons.)	Plastic& poliexpan. (Tons.)	Wood	kg/m^3 served to shop	Bag/purchase	Battery collected (Tons.)	% reciclaje	Recicled materials (Tons.)
2016	181.000	13.400	1.691	5.92	0.16	164	74%	196.000
2015	170.000	13.300	1.679	5.82	0.17	150	73%	185.000
2014	159.300	12.860	1.650	5.76	0.17	152		174.000
2013	150.700	11.210	1.870	5.61	0.18	160		164.000
2012	145.500	9.990	2.570	5.21	0.21	152		
2011	148.600	8.910	1.750	6.14	0.9	154		

Source: Author´s elaboration from Annual sustainability reports 2011-2016

4.5 Energy efficient policies in centres.

The company divided its consumption of energy into two large sections, firstly, that relating to its physical centres (warehouses, offices and stores) and secondly, that relating to energy for logistics through its transport and distribution network.

The energy consumption of Mercadona in its centres – the first type – could be segmented as seen in figures 2 and 3.

Figure 2: Distribution of total energy consumption in physical centers % Consumption

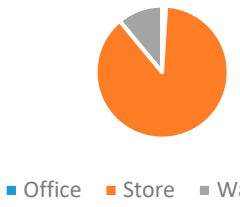
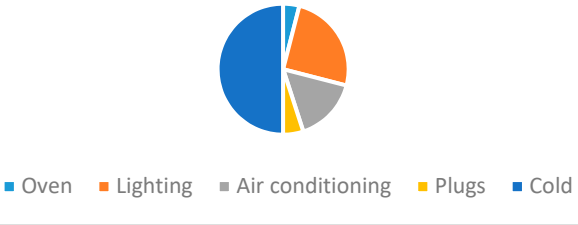


Figure 3: Breakdown of total consumption in store % Consumption



In 2007, Mercadona developed the Ecoefficient Store Project. Since then, all the new openings and renovated stores have more than 20 energy saving measures to reduce the total consumption of each store by 40%, which means an annual saving of 66.000

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kWh per store. In 2016, 50% of the stores in the chain were eco-efficient. Some of the main tips for this are:

Signal control. A system of continuous measurement of consumption and leakage of refrigerant gases, with early detection. This allowed a 25% reduction in greenhouse gas leaks. By the end of 2016, this was installed in 347 stores (22% of the total of the chain), and the goal is to complete its implementation by 2019. 40% of the estimated savings could be compared to a conventional store.

Energy management by zones. A centralized control system allowed the adjustments in the energy consumption based on the needs, modulating the lighting and air conditioning depending on the time of day or the tasks performed by the staff.

Improvement of the insulation. The thermal and acoustic insulation of the enclosure was improved to adapt to the climatic zone in which the store was located. This measure allowed better air conditioning and reduced energy consumption.

Closed frozen furniture. The design of frozen furniture with doors, together with other existing measures, such as floating condensation systems, reduced cold losses and saved energy. The floating condensation was also incorporated into refrigerated furniture, thereby improving the efficiency of the entire system. Table 7 shows general information about the energy in Mercadona, and Table 8 contains information about energy in the centres of the company.

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Table 7: General information on company energy

Year	Incomes (mill. €)	Environmental Investment	Reduction KwH (mill.)	Reduction CO2 (Tons. saved)	Energy Intensity Index
2016	19.823.51	27.000.000	20.000.000	nd	37.536.22
2015	19.077.48	25.000.000	10.000.000	12.000.000	37.829.94
2014	18.458.96	25.000.000	34.000.000	23.400.000	35.852.49
2013	18.062.45	24.100.000	24.000.000	19.000.000	35.532.27
2012	17.552.04	Nd	135.000.000	114.000.000	nd
2011	16.476.33	Nd	72.000.000	nd	nd

Source: Author´s elaboration from Annual sustainability reports 2011-2016

Table 8: Energy information in company centers

Year	Electricity consumption (kWh / m3 merchandise served to stores)	Total Electricity consumption (eletricity + gas) (GJ)	Stores (nº)	Eco- efficient Stores (nº)
2016	63.2	7.441.000	1.614	869
2015	62.4	7.217.000	1.574	819
2014	60.9	6.618.000	1.521	759
2013	61.1	6.418.000	1.467	687
2012	61		1411	535
2011	65.8		1356	420

Source: Author´s elaboration from Annual sustainability reports 2011-2016

4.4.5 Energy policies in logistic and supply chain management (SCM).

The second energy consumption area is the logistics network and the reverse supply chain. Thus, Mercadona undergoes continuous innovation, while looking for improved sustainability and efficiency of its logistic. One example of this is the "Strategy of the eight" for the reverse logistics, and purchases on quay, by which it collects the merchandise in the facilities of its integrated suppliers. Mercadona optimizes its logistics. The company has managed to raise the occupancy rate of its trucks to 81% of its capacity. This is achieved, on the one hand, by means of a good eco-design of the product that allowed the reduction of the "air" transport, and, on the other hand, careful planning of each route so that no vehicle travelled empty. At this

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point comes the reverse logistics, in which the fleet collects the products from the supplier's facilities and deposits clean containers. The company stated in the sustainability memory of 2016 that *"The fleet of trucks, owned by the integrated supplier Acotral, which works for Mercadona, is composed almost entirely of Euro 5 and Euro 6 engines, which meet the most stringent European emissions standards".*

Additionally, the operators of the logistics and transport sector of the company have already incorporated into their fleet several units of the so-called "megatrucks", vehicles of 25.25 meters length and capable of moving almost 60 tons of goods through the roads. These trucks of large dimensions will prevent CO_2 emissions.

Subsequently, in the logistic block, shipments to stores are organized, reusable containers are cleaned, and packaging material is prepared for recycling. Later, the stores receive the goods and return the used reusable packaging and recyclable materials to the logistics block. The change to the logistics process is called "Purchases on the dock" by the company. The company's truck goes to the supplier's facilities to collect the products and take them to their logistics centres, also taking advantage of the reverse logistics to carry reusable containers.

In addition, because the company has been betting on the fresh local product in recent years, this has led to an increase in local suppliers and, at the same time, shorter journeys. The company's fleet assumes the journeys previously travelled by the supplier, thereby achieving greater efficiency. Table 9 gives information about the logistic aspects of Mercadona.

Table 9: Information on energy in company logistics

Year	Tons. Ship	Tons. train	km Road
2016	170.000	833.700	435.000
2015	192.000	784.500	352.000
2014	686.500	249.500	318.700
2013	557.000	250.000	284.370
2012	685.000	290.000	
2011	619.000	349.000	

Source: Author´s elaboration from Annual sustainability reports 2011-2016

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4.4.2 Emissions.

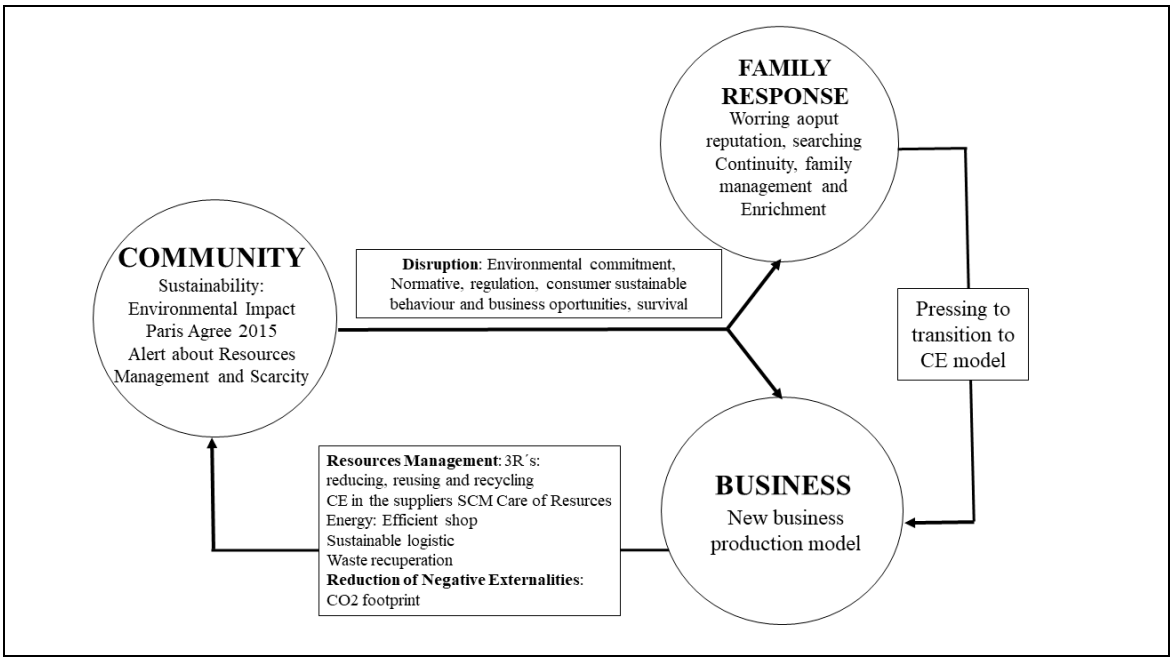
Table 10 shows information concerning the carbon footprint of the company, obtained mainly from the energy consumption in the shop and centre, the use of gases and logistic activities. During the last period, the company has improved the ratio intensity of CO_2, which link emissions and incomes.

Table 10: Emissions of Mercadona company

Year	Incomes (mill. €)	CO2 total (Tons)	CO2/m3 commodity	Refrigerant gases (g/m^3)	Intensity CO2 (CO2/Incomes)
2016	19.823.51	1.567	47.29	Na	0.079047
2015	19.077.48	1.515	47.78	Na	0.079413
2014	18.458.96			5.8	
2013	18.062.45			9.1	
2012	17.552.04			8.1	

Source: Author´s elaboration from Annual sustainability reports 2011-2016

Figure 4: Transition to CE model of Mercadona



Source: Author´s elaboration

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5. DISCUSION

The family business literature has been associating the term sustainability with viability. In recent years it has become aware that sustainability has several dimensions and that achieving sustainability, understood as long-term survival of the company, must take into account the elements that make up the system in which these elements operate. The community is an especially relevant stakeholder in the family business because it receives the business's sales and provides the income necessary for the company's survival. Thus, when family businesses seek to preserve their SEW, they pay special attention to the community.

The SEW framework highlights that one of the main objectives of family businesses is the search for continuity over time; the family will take the decisions required to achieve continuity. Business success and family balance are equally important to sustainability of the company. The family is conscious of the problem of resources exhaustion, from which the current linear model of production suffers, because it receives the disruptions produced by the community. The family will thus take the necessary steps to transition to a more environmentally sustainable model, such as CE, seeking preservation of the family's SEW.

The family organizes and manages resources, responding to disruptions emitted by the community and decides the paths through which these resources will be transferred to the environment, making the decisions necessary to preserve the environment and essential resources for life [64]. In our theory, these disruptions act as input for the family. Subsequently, SEW acts an accelerator, pressing the business to transition to a new production model. On the other hand, the business perceives two inputs—the disruption produced by the community, including regulations and legal imperatives, business opportunities, and financing; on the other, the family's pressure to make decisions in order to modify the production system by adding more environmentally sustainable features, such as reduction of negative externalities. Through preservation and care of natural resources, CE introduces the idea of resource-conservative manufacturing, leading to sustainable production [65]. Resources are objects, personal characteristics, conditions, or energy that are valuable in themselves because they contribute to achievement of worthy goals [66]. Resources are scarce. In the analyses of sustainability, resource exchange should not be limited to family and company but must include exchanges with the community. In this context, dynamic interaction occurs

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between the business model, product design, production chain management, and customers, treating each as an integral part of the manufacturer [19]. The case of study of Mercadona exemplify this matter, designing a system of relationships between supplier and company that facilities the Circular economy to each member of SCM. Company structures and their interactions currently condition the business model, whereas the interactions between energy flows, stocks, and resources are noteworthy elements in CE processes [30].

The family's desire to preserve SEW aims to shape the business to fit the needs of the family [67]. The family will thus push the business along three possible paths: The first follows the influence generated by the family's prominence, seeking socio-emotional or socio-ecological goals such as recognition and maintenance of reputation. Mercadona is positioned as leader in reputation in several ranks. Secondly, according to the long-term orientation of family business and the desire for transgenerational continuity, the family will press the business to change to this new scenario, which is positive for both the community and the family business. Thus, Mercadona director stated the transgenerational intention to be a family company. Thirdly, family enrichment, seeking happiness and harmony inside the family, will push the business to increase the speed of transition to a new production model such as CE. Since these three paths of influence are specifically derived from the family nature of the company, we can answer our own research question by saying that the family business will lead the transition to a new business model aligned with the CE, and that this behavior will be different from that of non-family companies due to the uniqueness of SEW of this kind of company.

Further, as to the process that occurs in the theory, we observe interactions between business and community. First, community publishes disruptions—whether normative or non-normative—that affect the business, acting as a trigger of change. The response of the business will be a gradual transition to a more environmentally sustainable model, such as CE. Thus, the company will establish a new framework of relationships with the community that will be beneficial for both subsystems. The community also provides entrepreneurial opportunities and financial support, seeking to develop and drive the CE production model.

Thanks to this transition, the company will be more sustainable in the long term, guaranteeing transgenerational continuity. Furthermore, family businesses will manufacture new products for the community, following C2C principles. They will help

to preserve resources by employing technological nutrients. The model of Mercadona pay special attention to maintain the useful life of the resources. Ultimately, the negative externalities created by the company will diminish. The transition to the new model will gradually be completed when the business's production follows CE principles.

The case of study of Mercadona allows us to test the proposed model and stablishs several contribution, firstly the environmental sustainability as a key to continuity of the family, providing a model of production that guarantees this continuity based on the CE. Further innovative aspects of our model include analysis of the interactions among the three basic units formulated by the theory: family, business, and community. The case of Mercadona also explains the processes that occur within the model, which begin when the community manages the norms and regulations designed to preserve the environment, acting as a disruptor to change the business model, and analyze the responses of the family and the business separately.

Our model contributes a second advance over previous studies of the sustainability of family business by adding relevance of the transition to the CE. The model analyzes not only the three subsystems but also the interactions, influences, and effects between them, supported by the Mercadona case of study. In addition to being useful for practitioners, explaining realities, and proposing ideas for real-world practice, the final theory is novel and relevant to the study of family businesses. The case of Mercadona illustrates sustainables practices regarding to Circular economy.

Our third contribution involves the practical application of SEW theory to the CE model. In recent years, the SEW approach has been applied intensely to study the family company. In fact, this theoretical framework justifies the specific behavior of the family business in its relations with the community and the environment. Such analyses have rarely used sustainability of the family business, although its characteristics give it a large explanatory capacity for sustainability. Through the SEW approach, our theory explains how the family acts in the face of disruptions produced by the community. The three dimensions of the SEW approach accurately reflect family behavior in pursuit of sustainability. Therefore, our study is one of the first to apply the scale provided by Debicki et al. [47], which includes family prominence, family continuity, and family enrichment that are the three main factors that cause transition to CE model, a unique

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feature derived from the family character of these companies. These three dimensions, as we have showed, were present in the case of Mercadona.

Practical implications

From a practical point of view, our study contributes by proposing a new model of production that is more environmentally sustainable, taking into consideration constraints such as new legislation and new technical processes in the environment of circularity by managing resources in a conservative way [65]. The goal of the company's production department will be to reduce negative externalities. Previously, traditional business models were designed to operate within systems of LE. This new system includes dynamic interactions between business models, product design, management, and supply chain customers. Care of resources includes the idea of multiple lifecycles of products, and energy conservation [69]. The model adds value for waste prevention and environmental protection, considering these aspects as integral elements of company strategy. We thus find a dynamic system that involves a process of sharing resources with the community, viewing resources not as waste but as technological nutrients for the community. This process will ensure environmental sustainability of the family business. The case of Mercadona promotes especially the cooperation between suppliers as a key factor to perform circular economy being a model that need to be taken into consideration by other family business

Secondly, the model proposes new design of industrial processes, in which resource transactions assume new dimensions, production shifts from linear to circular, and business goals incorporate environmental issues. Some of these elements are related to the family, others to the company, and still others to both. Environmental sustainability is achieved through the interaction of these subsystems and the new processes. Besides, the design and incorporation of reverse logistics into SCM will allow the family company to close the cycle of resources, improving its environmental sustainability.

6. CONCLUSION

Family businesses must consider this new scenario, in which the principles of CE are of prime importance, potentially as both threats and opportunities. The very nature of the family company positions it well to face the challenges that the new environmental scenario poses. Long-term orientation and desire to preserve the company and pass it on to subsequent generations makes analysis of sustainability issues especially important,

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and our CE model advances this effort. Conservation of resources, use of sustainable energy, and reuse of components will be the key factors in this new form of competition. Moreover, Mercadona exemplify the behaviour of the family business's sustainable entrepreneurial spirit will encourage these organizations to take on the challenges of the shift to Circular economy as real business opportunities. The family firm Mercadona perform CE since 2011 the CE. So, New, competing scenarios will emerge to help the company to survive, creating a lasting intergenerational legacy.

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