



**Circular Economy:
Application in the textile industry**

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1. INTRODUCTION

Over recent years, the effects and consequences of climate change have been exacerbated.

Both the companies and the human factor have played a very important role in the worsening of the planet. As a consequence: highly polluted cities, deadly diseases, deforestation, resource depletion and extinction of species.

In the present work we are going to talk about the traditional economic model and the alternative economic model that tries to solve the problems caused by this first one.

That is, we will talk about the economic model that has been used since the industrial revolution until today, a linear model where raw materials are extracted, transformed, and sold to consumers who later throw away the garbage, leaving them useless and being a hindrance and focus of contamination.

Then, and focusing on it, we will analyze the circular economic model, which is characterized by the reusing of each extracted raw material to produce and by the tiny production of waste.

Once we have analyzed both models, we will show how the circular economy can affect the economic growth of a region. In addition to the environmental benefits, it brings numerous advantages to the economic flows of the countries and companies that adopt this model.

Specifically we will focus on the European Union, since a few years ago began to implement this system and to promote it through a web platform.

Finally, we will present real cases of both national and international companies in the fashion industry and in the mobilephone's industry that take advantage of the opportunities of a circular model, and analyze how it affects their income statements.

2. OBJECTIVES

This paper aims to analyze the impact of economic activities in both environmental and social aspects. Specifically it will focus on the activities of the textile sector, as it is an industry that uses large amounts of natural resources and labor.

To do this, the concept of circular economy will be developed, analyzing how the companies of the textile sector have evolved up to now and how they are evolving towards more responsible economic models without renouncing their economic objectives and analyzing their profitability.

This paper will not only explain the advantages and the profitability and viability of the textile industry companies that follow a circular and sustainable model, but also see how it affects the development of business in the change of mentality of a society increasingly aware and concerned about the conservation of the environment and respect for human rights.

3. METHODOLOGY

To carry out these objectives, a research study of the recent circular economic model will be carried out, based on the reuse and repair of the products and the minimum generation of waste.

To apply this knowledge to real cases, it will focus on the textile industry, since it is the second most polluting industry on the planet. This section will analyze the impact of this sector on the environment and society. Then we will analyze various measures that are taken in this industry to contribute to sustainable development aimed at a circular economic model.

Subsequently, several cases will be carried out to study the profitability and viability of Spanish companies in the textile sector that have already implemented some of the characteristics of this recent economic model in the course of their economic activity.

4. ABSTRACT

Circular economics is a recent economic model that has emerged as a response to the new needs of society and our planet.

These needs have arisen because of the continuous use of a linear economic model, which has been developing since the industrial revolution, with which it has reached a point where there are no longer enough resources to extract, and through which we are contaminating the planet more and more.

Circular economics, as a solution to these problems, proposes a series of changes, such as the reuse of waste to manufacture new products or the manufacture of products that are long lasting in time so as to generate the least possible residues in the slower and more moderate way.

Increasingly, more and more industries are getting involved with the cause and are beginning to be involved in this change.

Specifically, the textile industry is beginning to take serious measures in this regard and starting to implement in its production processes the characteristics of the aforementioned circular economy.

It is true that a company that pursues social and environmental objectives, in addition to economic ones, is not as profitable today as a company that focuses simply on its economic results without following criteria of respect for the environment and society.

But we are facing a change, where more and more entrepreneurs and consumers are more aware of environmental and social importance.

And where companies are increasingly acquiring value for their good practices and not just for the profits they get whatever the price to pay.

5. THEORETICAL FRAMEWORK

Sustainable development.

According to the United Nations Brundtland Report (World Commission on Environment and Development, 1987) sustainable development is one that "meets present needs without compromising the ability of future generations to meet their needs". It is based on three fundamental pillars with which it tries to achieve a balance: social pillar, economic pillar and environmental pillar.

This is related to the term TBL (Triple Bottom Line), coined in 1997 by Elkinton. TBL considers companies not only for their economic value, but also for the social and environmental value they bring or destroy.

According to Henriques and Richardson, Elkinton proposes this concept as a motor to overcome the real model and migrate to a more plural world, with different types of companies and needs (Henriques & Richardson, 2004).

This concept of TBL is connected to the term Corporate Social Responsibility (CSR), referred to "the obligations of a company with society".

When they refer to Corporate Social Responsibility, it does not mean that companies will become charitable or charitable associations, but are intended to take an active and accountable position in the execution of their activities and their impact on the Environment, since companies are made to produce a level of profitability, otherwise they would not work. That is why CSR can be considered as a way of doing business based on sustainable development and the balance of economic growth (Polo and Arceo, s.f.).

Consumers

According to Zarfino (2010), what helps to have more interest in the ethics that is applied to the manufacture of each product is the information that makes available to the consumers the companies at present. Zarfino also thinks that this is crucial to condition buyers when deciding whether to buy one particular product or another.

Shen (2014) points out that the transparency of companies with regard to sustainability is very important, since sharing all the information about the supply chain with the consumers has a direct influence on sales.

All this supports the study of Kang, Liu and Kim (2013), which deals with the factors that influence young people when buying sustainable clothing. According to these authors, the most important factors would be the knowledge of the products and the effectiveness they perceive in them.

Today's society, increasingly aware of the environmental situation of our planet and the finite life of resources, plays a very important role in the decision of companies to integrate a socially responsible and sustainable business model.

Investors, workers and consumers exert pressure on companies to integrate social and environmental policies into their business.¹

6. LINEAR ECONOMY

In order to understand the concept of circular economy, it is necessary to give some basic information about our current economic model: the linear economy.

As Geissdoerfer, Savaget, Bocken and Hultink say in *The Circular Economy – A new sustainability paradigm review*, linear economics is the industrial system we currently have, based on a linear model of extraction of raw materials from nature, the transformation of these materials to obtain products, which later, when they end their life or are damaged are thrown away and they finally become waste.

To continue, we will see the consequences that this economic model has had from its beginnings to the present day.

It all began with the first evidences of industrial Revolution in the western Europe, from about 1830. According to associate professor Nerilie Abram of the National University of Australia, before the industrial revolution, the greenhouse gases were in the atmosphere in quantities much lower than the current ones, but the fast process of the change of temperature of the planet does not Was a consequence of nature.

¹Müller, A. L., & Pflieger, R. (2014). *Business transformation towards sustainability*.

Throughout the years began to notice the increase of the global temperature of the planet until the beginning of the climatic change became evident.

Since the Industrial Revolution, concentrations of carbon dioxide, methane and nitrous oxide have increased significantly, causing a continuous increase in the Earth's average temperature.

A linear model of “take, make, waste” could perfectly work in the hypothesis that the raw materials were inexhaustible and not very expensive and that their transformation did not have a negative impact on our environment.

Unfortunately, we have been using this model to this day and we have realized that it really is not sustainable, as resources are increasingly scarce and has produced many negative effects on us and our planet, as we have seen previously.

7. CIRCULAR ECONOMY

Although there is not a clear origin of the circular economy, there is evidence that the first concepts related to this term arose in the 70s, although it was not until the 90s when it began to have greater repercussion (Ellen MacArthur Foundation, *Towards the Circular Economy*, 2013). Eventhough there isn't a clear creator, there are several contributors to this “new” concept of economy, the main contributors are professor John Lyle, William McDonough, a chemist called Michael Braungart and the architect and economist Walter Stahel. (K. Winans, A. Kendall, H. Deng, *The history and current applications of the circular economy concept*, 2017).

Thanks to the conclusions of Boulding (1966), who concluded that the economy and the environment have to coexist in equilibrium, since they saw the land as a closed system with limited assimilation capacity, many authors have continued to investigate the theme.

Stahel and Reday (1976) created the concept of a loop economy. They identified new strategies to prevent waste generation, to encourage job creation and the efficiency of available resources. On the other hand, Stahel (1982) placed more emphasis on the use than on the ownership of the goods, in such a way that the costs associated with the elimination of the residues of those goods were minimized.

The most popular definition of Circular Economy is given by the Ellen MacArthur Foundation, which presents this concept as "an industrial economy that is regenerative or restorative by intention and design."

As we will see throughout the paper, the Ellen MacArthur Foundation has a great impact in this context, as it has made many contributions to the subject, such as Webster (2015) and various reports about the Circular Economy (EMF, 2013a, 2013b, 2014). In addition, this foundation collaborates with companies, the academic world and policy makers.

Now, based on all these contributions to the concept, we can define the Circular Economy as an economic system capable of regeneration, where, by closing and tightening the loops of material and energy, waste losses, energy leaks and emissions are reduced. Resource extraction decreases. All this is possible, through recycling, more durable designs over time, repair, maintenance, and reuse of products.

With the contribution of all these authors, among others, it was possible to make known this concept that is based on three fundamental principles (EMF,2013):

First principle: Preserve and improve natural capital by controlling finite reserves and balancing flows of renewable resources.

This means that, instead of extracting resources from nature, the circular system seeks, through technology and innovation, to use renewable and higher-yielding resources and to improve nature by allowing its regeneration.

Second principle: Optimize the yields of resources by distributing products and materials with their maximum utility at all times.

This refers to creating products that are ready to be remanufactured, repaired, updated or recycled at the moment they no longer perform their functions or are damaged, so that their components and materials are constantly in circulation without generating waste.

According to this principle the useful life of products can increase and encourage their reuse. Also the fact of sharing the products helps to reach its maximum use.

Many thinkers also speak of technological advances through which a recycled product can be of higher quality and have a greater value than a product manufactured by the linear economic system.

Third principle: to promote the efficiency of systems by detecting and eliminating negative external factors from the design.

This principle refers to the reduction of damages in areas such as education, health, leisure, and food, and better management of the use of resources by eliminating the different types of pollution that may be caused: acoustic, air, water, or toxic substances.

According to the Ellen MacArthur Foundation, in order to develop a circular economy, the three pillars described above are necessary, but to better understand what a circular economy is, based on the reuse of waste, we will now see its main characteristics:

The main feature is the lack of waste, since in theory all possible "residues" from the primary products would be ready to be reused as components to create new products (secondary products).

In practice, with this circular economic model, waste is still generated, since it is impossible to eliminate them completely, but in a much lower percentage than would be generated by a linear economic model. This re-use of the waste allows, in turn, to spend less energy since the extraction and transformation of raw materials would no longer be necessary, but this waste would be already prepared for its reuse.

It therefore also leads to a retention of economic value and resources, since everything is reused, both materials, work and capital invested in the production process. **(Fig.1)**

Annexus.

Following the information available at the Ellen MacArthur Foundation (Towards a circular economy, 2017) the main features of a circular economy are:

- Regeneration of ecosystems
- Extending the useful life of the products by reusing them, as second-hand products
- Optimize production processes and increase their efficiency by increasing the performance of manufactured products
- The reuse of the components of products to re-manufacture or create new products from them
- Apply new technologies that allow all the aforementioned, allowing the adaptation of the products to a new processes of transformation

7.1. Circular economy as a strategy for:

According to the European Organization of the Circular Economy, it acts as an engine for economic growth, which means ending unemployment and therefore improving economic performance.

1. Economic growth

The economic growth is derived from production costs, the use of the largest quantity of input products, and more, the higher income from circular productive activities. Everything that is directly affecting the demand, supply and prices of the global economy is what causes a number of positive effects on economic growth.

With these effects, the Ellen MacArthur Foundation, refers to the increase in spending and savings that would increase families' income and increase their purchasing power, due to the long duration of products and the Reducing the costs of materials and would no longer require all of them extracted, but modified, repaired or transformed.

2. Promotion of employment

As expenditure increased due to lower prices in all sectors due to lower production costs, which would entail an intense labor force in terms of high-quality recycling activities and better-qualified jobs in terms of the retransformation of the products or remanufacturing them.

This leads to more job opportunities, which would not only be limited to the aforementioned product remanufacturing and the growth of companies, since the job opportunities that would be created with a circular economic model are very broad and diverse.

These new jobs would be derived from new developments in logistics, greater innovation in research and development, entrepreneurship activities, the creation of new medium and small companies willing to adopt this circular business model or because of a new economy based on services .

3. Improvement of economic results

As for the improvement of economic performance, companies as mentioned above could reduce costs, and because of innovation and new product characteristics (reusable, repairable, durable ...) could generate totally new profit streams.

7. 2. Benefits of a circular economy

On the one hand, thanks to the reuse of resources, the circular economy reduces the extraction of raw materials. Therefore, it also causes the reduction in the environmental impact suffered by the countries from which these resources are extracted. This reuse also favors the reduction or elimination of the polluting discharges that derive from the economic activities of the companies.

On the other hand, the value that is created from labor, from capital invested in production processes and technology are maintained for long periods in the economy. This means that being a circular model, everything that is invested in economic activities does not disappear in the short term, but remains in the economic system.

In a closed cycle of production and consumption, as is characteristic of the circular economy, the net productivity of activities is increasing while the ecological impact is decreasing.

This increase in productivity also implies an increase in social productivity, that is, an increase in the quality and quantity of employment, which is very beneficial to the current economic situation in most countries.

In terms of innovation and new entrepreneurs, the circular economy offers many possibilities as it promotes the reuse and recycling of the components of the products, offering a great opportunity and a competitive advantage to those entrepreneurs or innovators who know how to anticipate themselves to the demand and the new environmental needs of the productive processes.

The consumer benefit is far more durable and repairable products that are able to reduce the cost of living by around 11%, according to the Ellen MacArthur Foundation, which allows them to have a greater purchasing power.

All this combined with the benefits of social and environmental welfare, would also generate improvements in human health and quality of life.

To sum up briefly, circular economics is a new economic paradigm in which goods are reused and recycled in a continuous circle that in turn creates new jobs, contributes to improving the quality of soil, water and air, and ultimately the planet and consequently also improves the living conditions of people.

7.3. Barriers to adopting circular economy business practices

According to Rizos, Behrens, Kafyeke, Hirschnitz-Garbers and Ioannou although a circular system has many benefits is not easy to implement, since there are some barriers for companies to adopt this model:

- Environmental culture

Although in general almost all SMEs in different sectors agree on their responses and the ability to adopt sustainable models, often the managers of the companies that make the strategic decisions do not have a positive attitude towards these "green" policies.

Fortunately, most SMEs are willing to adopt sustainable measures, although their attitude towards green policies will depend on the sector in which they operate. (Bradford & Fraser, 2007).

- Financial barrier

In financial terms, the initial costs that have to be invested in adopting sustainable measures and business models are important for SMEs (Oakdene Hollins, 2011).

Implementing and managing a recycling plan generally entails high investment costs for companies as well as other implicit costs such as the time and human resources used to make these environmental improvements. (Revell & Blackburn, 2013).

- Lack of government support and effective legislation

On the other hand, there is a lack of support and encouragement to adopt sustainable measures by the government, such as financing opportunities, import rights of goods, tax policies, etc. (Calogiriol et al. 2010; Studer et al., 2006).

This, together with the lack of a strict legislative framework, constitutes a great barrier for companies when considering the integration of sustainable solutions and practices in their business activity (Hillary, 2004).

- Lack of information

The lack of knowledge on the part of companies about the benefits of the circular model is one of the main barriers to its implementation.

While it is true that the implementation of sustainable policies requires a great investment during the first years of its implementation, in the long run it is very beneficial for companies to improve the efficiency of their resources, both financially and environmentally, in addition to creating a good image for consumers, increasingly aware of the importance of a sustainable system (Ellen MacArthur Foundation, 2013).

- Administrative burden

The move towards sustainable business practices by companies carries with them administrative costs derived from environmental legislation. These costs pose a problem for businesses. (OECD, 2010).

- Lack of technical skills

For many companies, it is easier and cheaper to use the technologies they are already familiar with and also rely on their suppliers for technical solutions.

For this reason, some companies are not able to implement and evaluate other more advanced technical options with which they can be united to the sustainable development and to the reduction of waste own of a circular economic model. (Calogirou, 2010, Trianni & Cango, 2012).

- Lack of support from demand and supply network

Although consumers, workers and investors are increasingly aware of the importance of a sustainable economic model, purchasing decisions are only partially influenced by sustainability criteria.

On the other hand, many suppliers disagree on the promotion of greener supply chains, which could lead to higher costs and consequently lose competitiveness (Meqdadi, 2012; Wooi & Zailini, 2010; Eltayeb 2009).

8. OBJECT OF STUDY

In the present work we will focus on fashion industry, a industry that has a strong impact on enviroment and human resources.

Then, after analyzing different fashion companies we will see that this sector is a clear example of the viability of a circular economic model applied to real companies.

9. IMPACT OF FASHION INDUSTRY

According to a study carried out by the UK Department of Environment, Food and Rural Affairs indicates that in the world of fashion exerts a great environmental, ethical and social impact. It occurs through the production of raw materials, transport of the products to any part of the world, (since nowadays there are many online sales) the consumption of resources and energy for the production of synthetic materials, toxic elements used in its production, such as certain dyes for fabrics, packaging and distribution of products and even abusive labor, poor working conditions, lack of security in production processes and child exploitation in many of the countries where the big firms of fashion develop their productive processes in order to reduce their production costs.

All this is linked to a new concept of fashion known as Fast Fashion, which consists of a way of producing fashion in a way that allows shortening the times of making and selling the garments, allowing the stores to change the supply of their garments every 15 days on average (Malcom Taplin, 2014).

In this way they manage to locate the products more quickly, with a more affordable cost to consumers and reaching a wider target. Usually these are poor quality clothes, due to the need to create new and cheap clothes to adapt to the constant changes on the wishes of society. From here emerges the term "wear and tear" (Cortez et al., 2014). It is actually mass consumption clothing.

As a result of all this, sustainable fashion companies are trying to carry out the opposite fashion concept, called Slow Fashion, linked to an ethical and sustainable fashion concept, which proposes a series of quality garments made from recycled and organic fabrics, that have a long life and are respectful of the environment and production processes.

The key to this new concept is a responsible and more conscious consumption by consumers. Apart from the standards of fashion, it is a new way of life.

- ENVIRONMENT

According to a BBC World report, "the textile industry ranks second in the ranking of the most polluting companies in the world."

Experts report that 70 million barrels of oil are needed to produce polyester, lyocell needs 70 million trees to be produced, all in a single year; And fiber does not break down in less than 200 years. These figures are alarming and not everyone is aware of it.

According to the Natural Resources Defense Council (NRDC) we can group the environmental damages caused in the different phases through which the product passes until it reaches the final consumers:

Raw materials: the choice of the fabrics with which the garments will be made is very important. On the one hand, are needed a lot of water and pesticides to cultivate natural fibers such as cotton or bamboo. On the other hand, it takes a lot of energy to make the synthetic fibers, which usually come from petroleum (NRDC, 2015).

According to a report by EcoWatch, although the use of organic cotton may sometimes seem like a solution to the use of contaminating fibers, more than 5000 liters of water can easily be used to make just one T-shirt and a pair of jeans.

Also, and it is already well-known, the elaboration of the synthetic fibers carries the use of toxic materials and high-polluting processes of transformation.

Production: In the dyeing process factories use a large number of chemicals that can be toxic, damaging the health of workers and causing significant damage to the environment. On the other hand, these chemical residues also pose a problem for consumers' health (Draper, 2007). At these stages of production, apart from toxic particles, companies contribute greatly to water pollution and the emission of carbon dioxide into the atmosphere (NRDC, 2015).

The Greenpeace association has been campaigning since 2011 for fashion companies to stop using toxic components in their clothing (Greenpeace, 2017).

Transport: Raw materials and labor are usually in countries where costs are very low. In addition, everyone can buy online from anywhere in the world. In fact, according to a report by the American Apparel & Footwear Association, about 98% of all apparel purchased in the US is imported from abroad (NRDC, 2007).

Use: According to Mother Earth News, the use of garments is the most polluting phase, since washing, drying and care of clothing can have a great impact on the environment.

According to the Nova Scotia Environmental Health Association Guide to Less Toxic Products, most fabric softeners contain a quaternary ammonium composition and other products that release formaldehyde. This is not only a contaminating factor but also affects the well-being of the population since much research has shown that treatment can cause depression, joint pain, chronic pain among other symptoms, and may even lead to cancer.

On the other hand, laundry detergents also have a polluting role since they are composed of surfactants and phosphates, considered to be the most harmful to water and the planet in general, which prompts an excess of algae growth and greater Mortality of marine life. As for the consumption and disposal of garments, it is remarkable that in the last decades the consumption of clothing has increased and thus waste (Draper, et al., 2007).

- SOCIETY

Since the 1980s, large brands have moved the manufacture of garments to countries where labor is cheaper in order to reduce costs. All this has led to a kind of covert slavery, with workshops where workers are poorly paid, without social security and sometimes are even children in or are in subhuman conditions (Zarfino, 2010). It is clear that this has been possible because of very permissive regulations in environmental and social terms (Kozłowski et al., 2012).

According to Madsen (2007) the main social impacts caused by the textile industry are:

Workers' rights: The new fast fashion movement, where clothing is renewed in a very short time, has made a great pressure on the companies that manufacture the clothes to be constantly adapting to the new tastes of society. This requires that factories and workers are continuously working with very limited times and margins.

It is also true that these factories are located in countries where there is not much regulation, which leads to unfair salaries, child exploitation and abusive labor journeys. Many times the workers are not very qualified for what they do not know their rights and can not be imposed to all this.

Safety and health of workers: workers are continuously under stress and in contact with the chemicals needed to finish garments, which are harmful to health. The poor state of the factories and the large number of people who have working without any type of security protocol exposes the workers to the risk of work accidents.

Poverty: the textile industry is thought to favor growth and development in less developed countries as it provides employment for low-skilled and uneducated people. But this has a double face, since jobs do not allow workers to grow professionally, that is, it provides them with employment but does not foster a real improvement of their situation Madsen (2007).

10. CONTRIBUTION OF FASHION INDUSTRY TO THE CIRCULAR ECONOMY

Over the years both companies and consumers have become aware of the importance of creating and using ecofriendly products.

Consumers, investors and workers are becoming more aware and we put pressure on companies to integrate more sustainable objectives in their business activity (Müller and Pflieger, 2014).

On the other hand, companies face the challenge of being sustainable while trying to meet their economic goals.

For this, in the world of fashion have emerged organizations that support both companies and consumers to follow this responsible ethic based on respect for the environment, without using raw materials, or intoxicating the planet, by making better use of resources that We have already obtained.

The Ethical Fashion Forum (EFF) is a platform that provides all the information about sustainable fashion.

It defines ethical fashion as "an approach to the design, sourcing and manufacture of clothing capable of maximizing the benefits to people while minimizing environmental impact" (Ethical Fashion Forum, 2017).

This platform collaborates with numerous organizations to carry out its objectives worldwide. Some of these organizations are:

- The Ethical Trading Initiative: improve and promote the implementation of corporate codes of practice which cover supply chain working conditions.
- The Responsible Purchasing Initiative: investigates how it would be possible to improve the impact of purchasing activities on the lives of people in developing countries.
- Made by: is a label that use some brands so that consumers know that their clothes are produced in a sustainable way.
- Labor Behind the Label: educates consumers, lobbies companies and government, raises awareness, and encourages international solidarity with workers.

11. REAL CASES

❖ ECOALF

Ecoalf is a Spanish company founded in 2012 by Javier Goyeneche, that came up with the idea of creating high quality clothing without the need to extract new resources from the environment. To this end, they focused on recycling (mainly plastic bottles, coffee grounds, used tires, fishing nets and recycled wool and cotton) to create a brand of fully sustainable clothing that could reduce both pollution and waste. Ecoalf also uses Sorona in its production, a fiber of renewable origin.

It also has alliances with the organization Ecoembes, to reduce the number of residues in the oceans. Its founder, Goyeneche, is also the creator of a new concept and ecological footprint called Tras(h)humanity.

The manufacture of durable products over time not only causes less waste to be generated but, being a company that manufactures products from waste, is a double action plan to reduce the amount of the same in the environment.

According to Juan F. Calero (2017) reporter of Innovaspain, this company was founded by the Spanish Javier Goyeneche, who started recycling PET bottles, a type of plastic belonging to the group of synthetic materials called polyesters. Javier Goyeneche first managed to transform these plastic bottles into fabric and then turned this fabric into a bag. From there, he began to use other types of recycled materials that also managed to transform into fabrics to later create garments, accessories and even slippers. It has now managed to develop 51 different fabrics.

According to a report by Carmen Mañana in "El País", billing in our country accounts for 9% of the company's turnover.

In order to carry out their project, they had to invest heavily in I+D+i, in addition to creating alliances with other countries, allowing them to continuously develop the necessary means to continue manufacturing sustainable clothing and accessories (Ecoalf, 2017).

In addition, its first market is the American, where it has managed to create several strategic alliances to boost its sales and to expand its company's philosophy.

The giant Apple commissioned a line of computer cases that are currently distributed in more than 250 stores of this company.

On the other hand also has collaborated with the actress Gwyneth Paltrow, designing an anorak that quickly got sold out few days after of putting itself on sale in Goop, the page of sale of clothes online of the actress.

We can not forget that he has clients like the famous designer Marc Jacobs, for whom he created a sustainable fabric, or rapper Will.i.am and the great company Coca-Cola with whom he has also collaborated on several occasions.

Even Louis Vuitton Moët Hennessy has commissioned fabrics made with 100% plastic bottles to make the bags where they sell the bags and shoes.

Currently, this sustainable fashion firm has only one physical store in Madrid, although it sells in more than 330 multi-brand stores.

Its main characteristic is the research, for the transformation and constant search of how and what materials they can recycle to manufacture its products. This has become the engine of its business activity.

In addition, Ecoalf carries out its production processes following a maxim: "only manufactures where it recycles", and has succeeded in doing so in more than 14 countries.

According to its founder, Goyeneche, Ecoalf is not a financial company, since analyzing its activity from a purely mercantile point of view it is clear that it is not a profitable company. Its philosophy is to respect the environment and recycle the products in a world where almost nobody does. This is his great badge.

According to Marta Calvo Robles, who belongs to the environmental department of the Technological Center of Footwear of La Rioja, Ecoalf is the Spanish company that invests the most and is most involved in R & D & I.

This company also belongs to the movement previously described "Slow Fashion", since unlike large companies like Zara, their fabrics take a long time to be manufactured, although they achieve qualities equal or better than the "Fast Fashion" brands. But it is possible to suppose a disadvantage for the company.

Another negative point, in which they are working to improve, is the price of garments, because it is more expensive to manufacture than to go to wholesalers. The coats that sell cost about 350 € while the bags of about 200 €.

Analysis of rentability

As we can see in the table of ratios of Ecoalf, **(Fig.2) Annexus**, the ratio of return on equity is positive, in addition to being quite high which means that it is a fairly solid company capable of creating value for its shareholders.

However, we observe that the profit margin presented in the last year is negative, but if we look at the previous years we see that although the margin is always negative, it is improving considerably from year to year, which means that there is evidence To think that in the future the company will get a positive profit margin that will increase.

❖ LIFEGIST

Lifegist is a sustainable fashion company created in Spain in 2013 by Mayte García, an industrial engineer who, after working on several projects related to sustainability and energy efficiency, decided to create their own company and apply their knowledge to the world of fashion.

This company buys organic fabrics (such as cotton, silk, bamboo, nettle, hemp and wool) certified by Global Organic Textile Standard (GOTS) in Europe, when they arrive, inspect them and send them to small workshops located in the capital of our country, where all the garments are made.

Recently, in addition to the use of organic fabrics, Lifegist has started to acquire recycled fabrics with the Global Recycling Standard (GRS), which allows them to save energy and water consumption in their production processes.

The creation of the garments is made in a 100% ecological way, making them by sustainable methods and friendly with the environment.

Following the business model of a circular economy, they not only do it through fabrics, but also try to make timeless designs that are not out of fashion and last longer. According to their philosophy, design and sustainability are not at odds.

Analysis of rentability

If we look at the profitability ratios of Lifegist (**Fig.3) Annexus**, the return on last year's assets available in its accounts is negative. This tells us that it is not a profitable company at the moment, financially speaking.

However, the return on equity is positive, since there is a return on the investments made by the company mentioned above in relation to the net profits obtained.

As for the profit margin, as in the case of the company Ecoalf, being newly created companies still do not have a positive profit margin, but looking at its trajectory over the years we can observe a remarkable growth of the margin of Benefit as it is becoming less negative. In turn we can intuit that it will not take long to make a profit.

❖ RESET PRIORITY

Reset Priority is a company founded in 2012 by Ester Milano. Although when she started, she did not base all her creations on a sustainable system, she gradually introduced herself to this cause until finally the firm was a 100% sustainable company. It is a clear example that the change to a circular system is possible.

Now dedicated to the manufacture of bath clothes with materials that respect the environment and of long duration, according to the characteristics of a sustainable and circular business model, following at all times the productive process, from creation to the end.

They started by creating part of their collections of bathwear made with Econyl, 100% regenerated nylon, since they have recently joined the sustainable fashion movement, but are working to become a 100% environmentally friendly company.

Today, just like the sustainable firm Ecoalf they create their fabrics using fishing nets recovered from the sea and recycled plastic bottles.

With all this they do not give up the quality of their products since their garments have a superior durability certified by Xtra Life Lycra, which resists up to 10 times more damages caused by chlorine and salt.

They are garments designed to last in time, which corresponds completely with the characteristics of a circular product model.

As we have seen, its main feature in relation to the Circular Economy is the durability of products and responsible manufacturing in developed countries where the poor working conditions mentioned above are not present since there is a labor regulation. They also track the garments from the beginning of production until they are finished.

Analysis of rentability

As we can see in the profitability ratios of the company, **Fig.4 Annexus**, the company Reset Priority presents a positive return on equity, which means that there is a return on capital that has been invested, based on the benefits Obtained by the company.

We also see that in this company, the return on total assets is also negative, although it is also recovering over the years.

This may be due to the heavy investments that must be made by companies like this that are added to circular production processes, having to invest in R & D & I in order to transform waste into new raw materials for new products.

However, the profit margin presented during the years available in SABI is negative, but it is improving year by year, which means that the company will soon have a positive profit margin, just as the two companies previously analyzed .

12. JOINT ANALYSIS

After analyzing each company separately we will analyze the three companies as a whole, in such a way that we will see the common characteristics that they share between them and their differences.

The three companies analyzed are companies that are practically of recent creation, as we can see in the **chart 1** of the life cycle of companies are stage 1 and have not yet reached the point where they begin to have a positive profit margin, which We have previously commented on the separate analysis of each company.

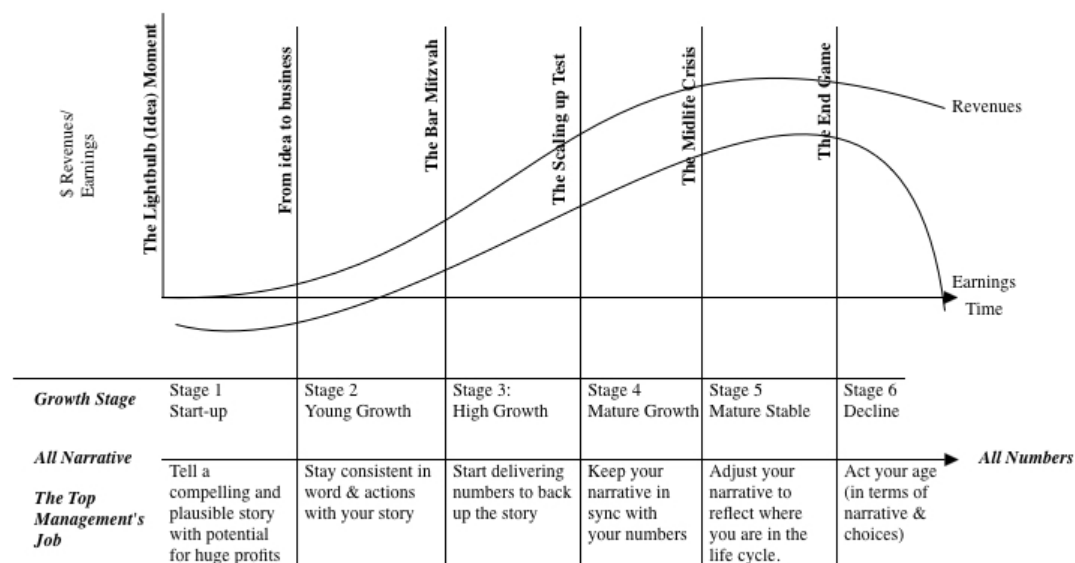


Chart1

Source:ZDnet.

This does not mean that companies are a constant loss, but because they are precisely in this phase of growth do not have a positive profit margin at the moment. But they will reach it when they reach stage 2, Young growth.

As we can see in **chart2**, in the rate of return ratios (ROE) we observe that the three companies present a positive ROE. This ratio is responsible for measuring whether the company is properly using its assets to generate income.

This ratio of profitability will depend on how the company is structured in terms of financing

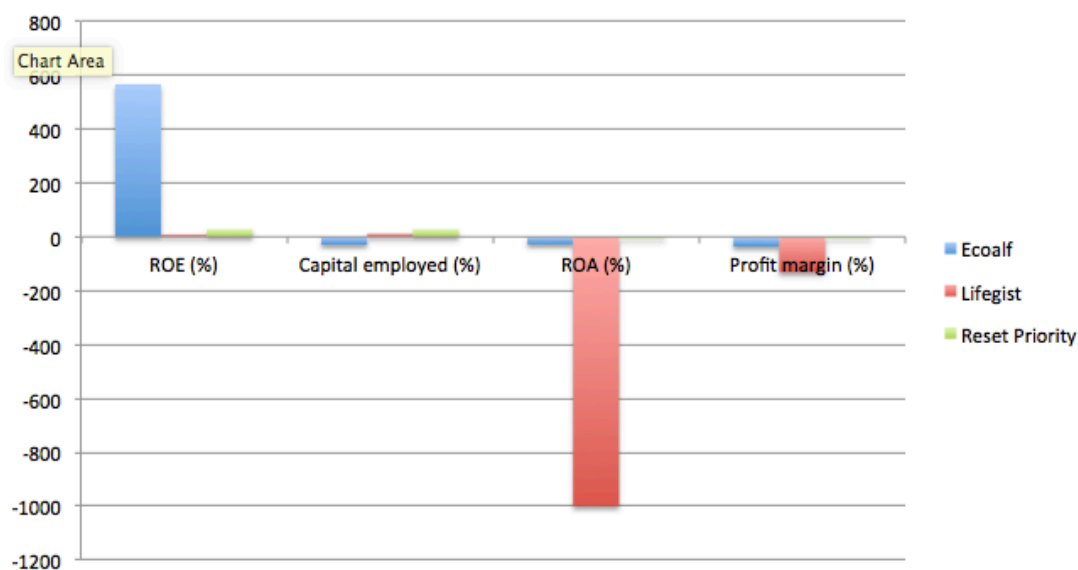


Chart 2.

Source: Own production based on SABI data.

In our case, when presenting a positive ROE, we could say that the three companies are profitable in terms of the correct use of their resources.

This means that if we did not take into account the large financing needs that the three companies analyzed have, due to their characteristics, they would be profitable companies.

As we will see below, the large financing needs in new productive systems in the research and development of new materials or the higher costs incurred to make fully sustainable garments possible, make that these companies are not as profitable as they could be.

The ratio of return on total assets, or ROA, is used to measure the efficiency of the total assets of the companies, regardless of the sources of financing that have been used. It could also serve to measure the ability of each company to generate income. In our case studies we have seen that the three companies analyzed have a negative ROA. When this happens it means that companies are investing a lot of capital in production and at the same time they are not receiving too much revenues.

As we have seen before, these companies are characterized by the use of more expensive materials to obtain, and products with higher manufacturing costs, which means that their final garments have higher prices and are less competitive in the market. This makes these companies cannot be the most profitable, as society is increasingly aware of social and environmental respect but still have a long way to go. Many times consumers prefer cheaper clothing and turn a blind eye, buying without taking into account the impact they cause in their environment.

With this data we can talk about leverage, show non **chart3.**, the difference between ROE and ROA is the well-known leverage effect. This can be positive, negative or zero. As we see, both the company Ecoalf and the company Lifegist have a negative leverage ratio. This occurs when the average cost of debt is higher than the economic return (ROA).

This is consistent with the characteristics we have analyzed of these companies, since having high costs in terms of labor, obtaining raw materials to manufacture their products and the large investments they have to make in R & D, they need large financing measures and consequently this increase in the cost of debt.

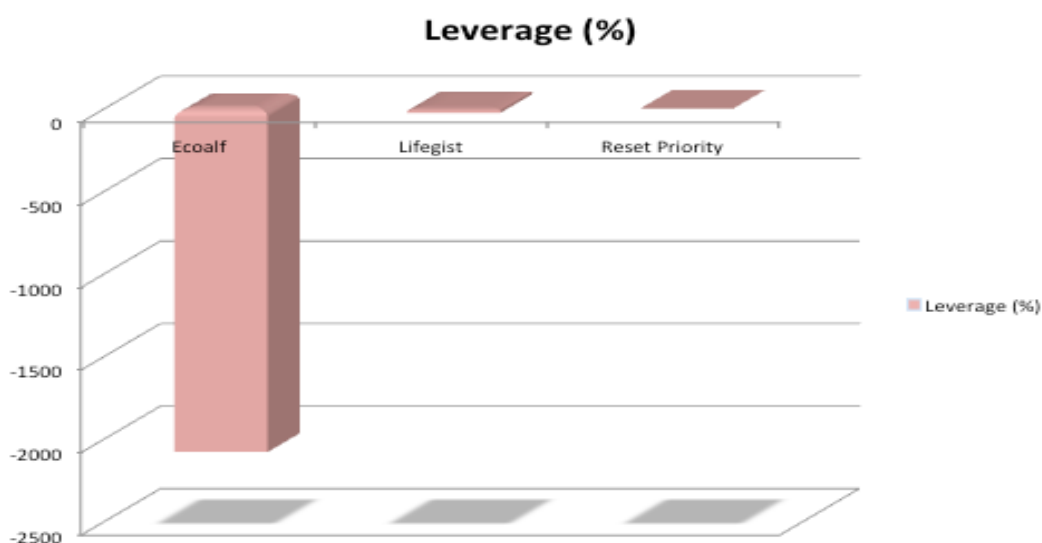


Chart 3.

Source: Own production based on SABI data.

However, it is not surprising that Reset Priority has a zero leverage ratio. This happens when the ROE and the ROA coincide, or what is the same, when the whole of the asset is financed with own funds.

This is possible because this company did not start implementing a sustainable production system, being able to avoid the extra costs that it supposes for the companies to follow a philosophy of sustainability and obtain greater benefits.

These facts allowed Reset Priority to finance himself without having to borrow in the moment of investing in assets to enter the sector of sustainable companies.

On the other hand, the three companies have a negative profit margin, but each year is higher, or in these cases less negative.

With this we can deduce that at the moment companies are losing money but that they are improving year after year, until reaching positive profit margins.

All of this is because there are large costs and little income, since the profit margin is nothing more than the difference between income and costs.

As we have said before, these are companies that are not too competitive in the market in terms of prices and profits, but they are in terms of ethics and sustainability.

This is becoming more and more important as we are evolving towards a change of mentality, consumption and economy where more and more people are willing to sacrifice economic benefits in exchange for gaining environmental, well-being and human rights.

Keeping in touch with the characteristics of a Circular Economy mentioned above, we can resume the main information about the companies in the following **chart 4**. where it is shown more graphically the contribution of each company analyzed to this system.

Circular Economy characteristics related to the firms:

	ECOALF	LIFEGIST	RESET PRIORITY
Waste generation	<p>Their products are designed to last in time, which causes less waste generation.</p> <p>In addition their products are made from waste, which makes it reduce the level of this element in the environment.</p>	<p>This firm is based on reducing the environmental impact when using organic materials and products for the most durable possible, so as not to continually extract raw materials and thus reduce the generation of waste.</p>	<p>Since their garments are made from recycled nylon, they contribute to the reduction of waste, since a good part of them are made with these fibers.</p>
Use of recycling and sustainable materials	<p>It produces all its products from other 100% recycled products that it recovers from the environment, reducing the amount of waste that is found on our planet.</p>	<p>It manufactures its garments with organic fabrics, certified by GOTS (Global Organic Textile Standard).</p>	<p>Its garments are made with Econyl®, 100% recycled nylon.</p>
Fair labor source	<p>It manufactures in those countries where it can carry out the recycling of waste. There is no information on bad work practices.</p>	<p>European suppliers. All the garments are 100% made in Spain, where there are labor regulations and decent wages.</p>	<p>All collections are manufactured between Spain and Italy, where there are decent working conditions.</p>
Manufacture of durable product	<p>The three companies manufacture their products aimed at lasting over time</p>	<p>The three companies manufacture their products aimed at lasting over time</p>	<p>The three companies manufacture their products aimed at lasting over time</p>
Ecological Labels	<p>Sorona® Recycled PET Tras(h)umanity</p>	<p>Global Organic Textile Standard</p>	<p>Econyl®</p>

Chart 4.

Source: Own production based on the previous information.

Even so today the sustainable firms, like the ones analyzed, are not the most profitable companies since there are still large companies that only look for their economic and financial interests, regardless of the negative impact they may cause.

This makes it very difficult for new companies that do want to follow a circular and sustainable economic model to develop and achieve a positive profitability.

13. RESULTS

We have observed that the results obtained when analyzing the companies differ.

As we can see, all the companies analyzed have a negative return on assets, this is due to the great investment they have to make in R & D & I in order to be able to adapt to the circular business model, through the implementation of new systems capable of reusing and convert them into new products.

We also note that even if the company is not initially profitable or does not earn a good profit margin, in the medium and long term, if they have positive profit margins and positive returns, while being able to function with a circular economic model, even if this means giving up large incomes.

The large investments in R & D & I required to be able to transform waste to be reused or the support of higher costs due to the use of labor that is not carried out in developing countries makes it much more difficult for sustainable companies to present positive financial and economic profitability ratios. Even so many of them will managed to be profitable by implanting sustainable models in the near future.

It is true that these companies are newly created or recently adapted to these models, which always means a big initial investment and it takes a long time until they start to reap benefits, as we have seen in the cases studied.

It also hinders the way the existence of large companies that still prefer to get the maximum economic benefits at all costs. By doing this, sustainable companies can not compete in terms of cost and price reduction.

Fortunately, today there are many consumers who put ethical business practices before the cheap products, and they do not mind paying a higher price for a responsible, ethical and more durable product, without sacrificing design and quality.

14. CONCLUSIONS

As we have seen throughout the work a linear economic model based on the extraction of materials, to be transformed and have a finite life cycle and then be thrown away as waste has been operating from the industrial revolution to our days. But as we have deduced it is a very limited economic cycle and detrimental to a planet where resources are increasingly scarce.

However, a few years ago a circular economic system was proposed, where the waste would not be useless any more, but would recover to be introduced again in the productive cycle, in such a way that each time the quantity of waste is reduced more and more Extraction of raw materials. As we have mentioned before, all this results in a lower pollution in the environment, since the products do not need so much processing to be reused.

We have also concluded that it is not easy to implement this circular model. Although at first glance almost everything seems to be advantageous, there are several entry barriers in order to be able to implement it 100%. This would require even more change in society than there is now, but it seems that it will not be for a few years, as society is increasingly aware of social and environmental respect and has a great influence on development Of business activities.

As an example, we have focused on the textile industry, as in this sector is booming the implementation of responsible policies and the use of circular systems in terms of product characteristics and production processes. We have seen that fortunately there is a change in the mentality of consumers and many entrepreneurs but unfortunately we still have a long way to reach the point where it is intended.

Although some companies adopting these circular criteria manage to become profitable, many of them present difficulties, and most importantly, not all of them are willing to sacrifice profits to gain in product quality and environmental quality.

We are at a point where companies still have enough freedom to choose whether they want to be sustainable or not, because there are no strong regulations that impose these practices.

This is something that should change, since, in this research, companies that are able to survive with less benefits and respect the environment and society, but society and the environment can not continue to coexist with highly polluting companies And toxic products that worsen people's quality of life.

It is true that the companies that are closest to a circular business model are not the most profitable, or they are not 100% in all its aspects. But here comes the big question: many companies put sustainability ahead of maximizing their profits. This does not mean giving up profits, although adopting a sustainable business model means giving up all the gains that could come in.

For this reason many entrepreneurs still refuse to join the circular economic model, as we have seen in the present paper, this is one of the main barriers to entry of this system in industries.

We can also conclude, even if today is a little idyllic thinking, if we all contribute to the cause, both consumers and manufacturers, could be achieved a better implemented economic model where not only economic and environmental benefits but Would also lead to a higher purchasing power, and could produce less expensive products, with a fairer and more transparent price; This would bring benefits to people's health and quality of life due to less pollution of the planet and improved air and water.

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16. ANNEXUS

❖ CIRCULAR ECONOMY FRAMEWORK

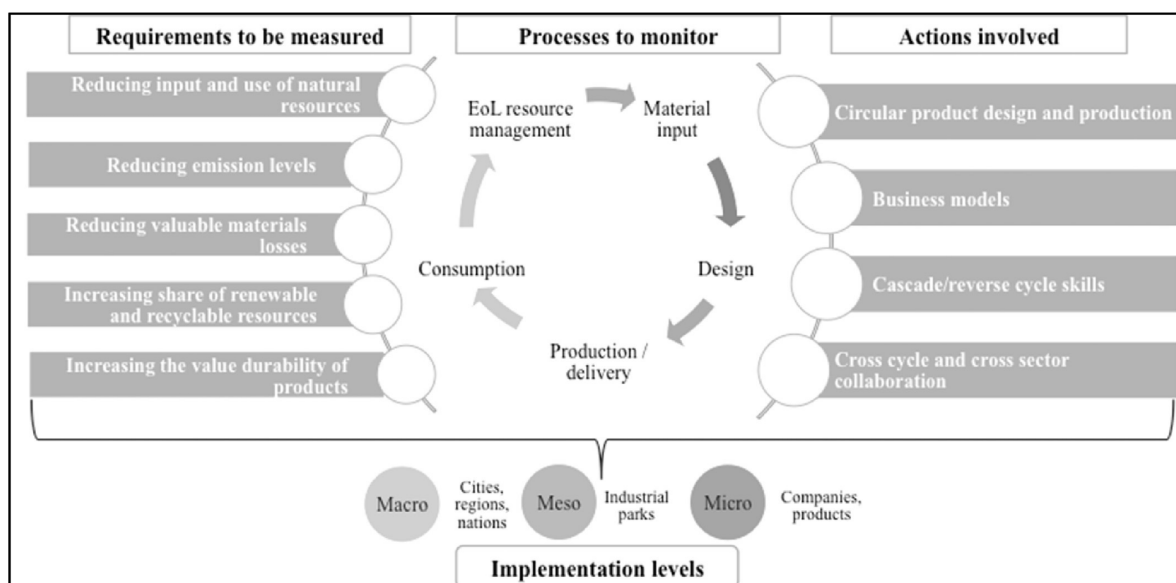


Fig. 1 Source: Measuring circular economy strategies through index methods

❖ ECOALF:

ECOALF RECYCLED FABRICS SL

Ratios formato global			
Cuentas No Consolidadas	31/01/2015	31/01/2014	31/01/2013
	EUR	EUR	EUR
	12 meses	12 meses	12 meses
	Salvedades		
	Abreviado PGC 2007	Abreviado PGC 2007	Abreviado PGC 2007
A. Rentabilidad			
Rentabilidad sobre recursos propios (%)	566,35	-222,93	-46,69
Rentabilidad sobre capital empleado (%)	-29,11	-57,88	-34,51
Rentabilidad sobre el activo total (%)	-27,54	-50,65	-30,94
Margen de beneficio (%)	-36,21	-88,52	-242,87
B. Operaciones			
Rotación de activos netos	0,94	0,68	0,14
Ratio de cobertura de intereses	-6,19	-23,05	-76,96
Rotación de las existencias	2,01	1,61	0,44
Período de cobro (días)	104	116	354
Período de crédito (días)	14	92	282
C. Estructura			
Ratio de solvencia	3,73	4,07	6,82
Ratio de liquidez	1,70	1,85	4,29
Ratios de autonomía financiera a medio y largo plazo	-0,06	0,37	2,98
Coefficiente de solvencia (%)	-4,86	22,72	66,27
Apalancamiento (%)	-2.080,32	270,78	34,52

Fig.2 Source: SABI(Sistema de análisis de balances ibéricos)

❖ LIFEGIST

LIFEGIST SL.

28020 MADRID (MADRID, ESPAÑA)
 Empresa privada
 Empresas sin accionistas y participadas identificadas

Código NIF B86670601
Fecha últimas cuentas 31/12/2015

Ratios formato global

Cuentas No Consolidadas	31/12/2015	31/12/2014	31/12/2013
	EUR	EUR	EUR
	12 meses	12 meses	10 meses
	PYME PGC 2007	PYME PGC 2007	PYME PGC 2007
A. Rentabilidad			
Rentabilidad sobre recursos propios (%)	9,24	50,77	102,43
Rentabilidad sobre capital empleado (%)	12,21	76,28	583,13
Rentabilidad sobre el activo total (%)	-999,80	-749,02	-573,76
Margen de beneficio (%)	-131,13	-863,52	-9.025,56
B. Operaciones			
Rotación de activos netos	-0,09	-0,09	-0,06
Ratio de cobertura de intereses	n.s.	n.s.	-871,76
Rotación de las existencias	n.s.	n.s.	n.s.
Período de cobro (días)	7	261	4.665
Período de crédito (días)	104	0	0
C. Estructura			
Ratio de solvencia	0,00	0,08	0,42
Ratio de liquidez	0,00	0,08	0,42
Ratios de autonomía financiera a medio y largo plazo	-4,11	-2,99	-1,21
Coefficiente de solvencia (%)	-10.822,04	-1.475,40	-560,16
Apalancamiento (%)	-25,74	-33,45	-82,46

Fig.3 Source: SABI(Sistema de análisis de balances ibéricos)

❖ RESET PRIORITY

RESET PRIORITY SL.

08029 BARCELONA (BARCELONA, ESPAÑA)
 Empresa privada
 Empresas sin accionistas y participadas identificadas

Código NIF B
Fecha últimas cuentas 3

Ratios formato global

Cuentas No Consolidadas	31/12/2015	31/12/2014
	EUR	EUR
	12 meses	12 meses
	PYME PGC 2007	PYME PGC 2007
A. Rentabilidad		
Rentabilidad sobre recursos propios (%)	28,91	289,47
Rentabilidad sobre capital empleado (%)	28,91	289,47
Rentabilidad sobre el activo total (%)	-6,37	-98,60
Margen de beneficio (%)	-5,73	-342,09
B. Operaciones		
Rotación de activos netos	-5,05	-0,85
Ratio de cobertura de intereses	n.s.	n.s.
Rotación de las existencias	4,68	0,57
Período de cobro (días)	136	148
Período de crédito (días)	7	265
C. Estructura		
Ratio de solvencia	0,66	0,50
Ratio de liquidez	0,47	0,12
Ratios de autonomía financiera a medio y largo plazo	n.s.	n.s.
Coefficiente de solvencia (%)	-22,05	-34,06
Apalancamiento (%)	0,00	0,00

Fig.4 Source: SABI(Sistema de análisis de balances ibéricos)