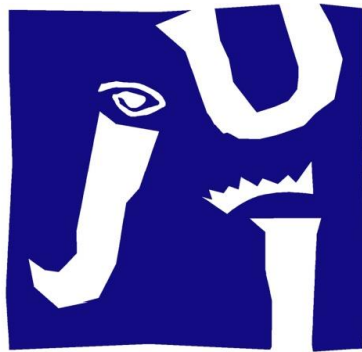


THE ANTHROPOCENE AND THE CAPITALIZATION OF THE ENVIRONMENT

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Abstract: Throughout this paper we try to identify in time, the beginning of Anthropocene by establishing direct links with the current economic system, capitalism. As well as the consequences of overproduction and overexploitation of natural resources, which are currently seriously deteriorated. On the other hand, actions that could improve the current situation and diminish the footprint of man are presented, which has led to identify this new era. Finally, we will try to identify certain financial factors and we will proceed to compare them with environmentally responsible actions or not, as well as the empirical results of this comparison and the conclusions of the set of information that has been intended to cover throughout these pages.

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THE ANTHROPOCENE AND THE CAPITALIZATION OF THE NATURE

2. Introduction

Throughout this work is intended to explain the change of environmental era that we are suffering today. We have gone from the Holocene to the Anthropocene. In this way, I will analyze some studies of professionals to try to establish the exact point where the trace of man becomes easily detectable for geologists in the "geological record". On the other hand, I will clarify the causes of the origin of this term and the moment in which it is decided to classify this era as the Anthropocene.

I will also try to find a link between these aspects and the capitalization of it, since, by making an exhaustive study on this subject we can identify a clear economic interest on the part of different participants in the world economy, as well as catalog the countries with the greatest influence in Regarding environmental deterioration and around which indexes are related.

Finally I will expose the possible measures that have been taken to try to stop this climate change and the environmental disaster to which we are being participants and from which irrefrenably there is no turning back, according to several studies.

3. Changes of era throughout the history of Earth

A geological era is a formal chronological geologic unit of the temporal scale that establishes a period of time in which a series of similar events occur in regard to the formation of all the rocks of that same period. At the same time, the eras are subdivisions of the geological periods that represent the time corresponding to the duration of a system and that allow dividing it into ages. The most frequent periods are important in terms of biota (set of the flora and fauna of a region, as well as fungi, bacteria and protists that have that region) that correspond in each period.

As you can see in the picture below there are several eras that the Earth has suffered but we will focus on those which the hand of man has been latent since it appeared until now, which is the corresponding to the Quaternary.

Era	Periodo	Época	M. años atrás ^{nota 1 2}
Cenozoico	Cuaternario ^{nota 1 3}	Holoceno	0,0117
		Pleistoceno	2,58
	Neógeno	Plioceno	5,333
		Mioceno	23,03
	Paleógeno	Oligoceno	33,9
		Eoceno	56,0
		Paleoceno	66,0
Mesozoico	Cretácico		-145,0
	Jurásico		201,3±0,2
	Triásico		252,17±0,06
Paleozoico	Permico		298,9±0,15
	Carbonífero ^{nota 1 4}	Pensilvánico	323,02±0,4
		Misisípico	358,9±0,4
	Devónico		419,2±3,2
	Slúrico		443,8±1,5
	Ordovícico		485,4±1,9
Cámbrico		541,0±1,0	

Figure 1. (Mejía, 2017).

Note 1. All dates are given in millions of years for the beginning of the time in question. That is, the “M” is the abbreviation of millions. The dates marked with Golden Clove are approximate and are based on international agreements with GSSP.

The geological period of the Quaternary is identified with the appearance of Homo Sapiens on our planet, moment that is also attributed to the extinction of large species, both plants and animals and as a result of which birds, vertebrate mammals and human dominated the Earth. During this period the biota was very similar to the one we have present today except for the migrations of large mammals.

3.1. The Holocene: concept and appearance of it.

The Holocene is a geologic era of the Quaternary which it is attributed from the climatic change of the Recent Dryas (or better known as "cold episode"), up to the year 2000, covering a total of 11,784 years. During this time our planet underwent a series of changes, such as the change in temperature; it became softer, causing some ice caps to disappear or losing their volume. As a result, the sea level raised. This fact led to a separation of some countries like the case of Indonesia, Japan and Taiwan respect to Asia, or Great Britain of Western Europe, as well as New Guinea and Tasmania. On the other hand, the rise in sea level also produced the formation of the Bering Strait, which currently connects the Arctic and Pacific oceans. In addition, this time is attributed to the emergence of agriculture and civilization of Homo Sapiens and important changes in the environment that are attributed to them.

3.2. The Anthropocene: what it is and when it appears the concept.

The Anthropocene period is a term that has been proposed by some scientists, for example the Nobel Prize in chemistry Paul Crutzen, which aims to follow the Holocene, being this dated since 1867. This term comes from a Greek term, “anthropos” that means man, and more generically, human (Irwin, 2011). The reason for the need to call the current era this way lies in the important global impact that human activities are having on terrestrial ecosystems. (Mejía, 2017) (Crutzen, 2000).

Therefore, the Anthropocene is considered a geochronological unit in the strict sense or as a physical stratigraphic record with lithostratigraphic, biostratigraphic, chemostratigraphic components ... The Anthropocene would include all accumulated deposits above its established limit, whether they are of anthropogenic origin or of natural origin, including those that do not present any human influence (such as, for example, volcanic tuffs or desert sands). It is necessary to look for a stratigraphic marker of the boundary between the Holocene and the Anthropocene that reflects the

end of one and the beginning of the next to assess whether our planet has changed significantly to make the new suggested temporal unit justifiable and useful.

It has been considered that the change of era in certain, due to the anthropogenic acceleration of the processes of erosion and sedimentation in the terrestrial surface, that caused that a physical registry of the Anthropocene and sea clearly identifiable and differentiable of the Holocene has been made, there is a great geological novelty by a series of precise, ubiquitous and permanent anthropogenic footprints in rocks, glacial ice or marine sediments (Cearreta, 2015).

3.3. Temporal limits and differences between Holocene and Anthropocene.

Although there are several scholars who have tried to establish a clear date, it has not been possible yet to determine any date more or less precise, because it is in its early stages of development. There are several theories about the beginning of it: (Mejía, 2017):

1. The so-called early Anthropocene:

The idea of the early Anthropocene pays special attention to the signs associated with the onset of deforestation, agriculture and animal domestication. The human communities left a large archaeological record totally different to that which had been recorded in the rest of the previous warm phases.

According to this theory it is believed that the limit of the Anthropocene could had begun long ago, based on stratigraphic signals that reveal the human origin. Although if the basis is the development of the human being in terms of agriculture, deforestation and animal domestication, it becomes quite complex to be able to define an exact date due to the expansion and intensity of these events. This is explained, for example, by the fact that agriculture was not produced at the same time in all parts of the world; that means it is not an exact one for the whole planet, but it should be considered a possibility that oscillates between millennia and tens of millennia.

2. The industrial revolution:

The original proposal relates the beginning of the Anthropocene with the Industrial Revolution at the beginning of the 19th century, just after the invention of the steam engine and with the initial increase of concentrations of carbon dioxide and methane in the atmosphere above the base limit of the previous era. This moment coincides with a range of population growth and urban development, as well as the booming

industrialization of fossil fuels. Thus, the new era would be identified by the first evidences of environmental transformation on the part of the human being.

Currently, our species is the cause of the origin of that transformation and specifically, the limit associated with this start would be the Industrial Revolution. However, it is believed that both the industrial revolution and the early anthropocene have the same problem, since the phenomenon that occurred in the nineteenth century did not expand immediately on all continents in the same way or at the same time, but It was during a time interval. In this way, the stratigraphic signals directly associated with industrialization are affected by discontinuities. In addition, it has been observed that certain global signals, (such as the rise in carbon dioxide levels) are gradual over the decades and therefore do not serve to establish a precious time limit.

3. The Great Acceleration:

The third theory of allocation of time limit for the Anthropocene has shown that from the Second World War begins a phase of accelerated increase of the human population and, in parallel, we observe a global economic increase that has caused an environmental change of a magnitude never before seen on our planet. Thus, since 1945 the proportion of people living in cities has grown from 27% to 53% at present.

Due to these changes, several stratigraphic markers identify this change of era:

- Global diffusion of artificial radionuclides due to atomic explosions in the atmosphere.
- Duplication of reactive nitrogen storage as a result of fertilizer production through the Haber-Bosch process
- The creation and global dispersion in the middle of new materials of human origin, plastics, aluminum waste, cement... and of artifacts made with these materials that can be considered future techno-fossils.
- Global dispersion of pollutants due to the expansion of industrial activities that include new organic components and large magnitudes of concentrations of heavy metals.
- Extinction and invasion of terrestrial and marine species that modify the environment in which they are introduced and leave a clear paleontologist record.
- Acceleration in the combustion of hydrocarbons that has caused an increase in carbon dioxide of 120% since the middle of the 20th century

- The annual transport of materials by human activities has tripled globally the sedimentary transport of rivers to the oceans.

The AWG considers and identifies this theory to establish the lower limit of the Anthropocene. However, there are some studies (Wolff, 2014) that disagree when establishing this limit because it considers that the biggest changes are still to happen due to human disturbance and that, therefore, a longer perspective would be necessary to be able to properly assess said limit. The AWG agrees with this contribution and will be shown differently with a future perspective and based on other stratigraphic signals such as a marine transgression or a mass extinction. In any case, the AWG is based on the fact that the changes that have already taken place are sufficiently clear to establish this limit, since it is considered that the Anthropocene has a solid base and reflects the current geological reality.

Lewis and Maslin (2015) have proposed two new potential horizons for the Holocene / Anthropocene boundary. On the one hand, the year 1610, which corresponds to a short-term decrease in the concentration of atmospheric carbon dioxide observed in 2 ice surveys in Antarctica and that, would be associated with the depopulation of America caused by European colonization. On the other hand, the year 1964 in correspondence with a peak in the radiocarbon signal in excess coming from atmospheric atomic tests. However, for the first date, which has been denominated as "Orbis hypothesis", the magnitude of the fluctuation is within the range of natural variability of carbon dioxide during the Holocene and, in addition, its possible anthropogenic origin is not demonstrated. The year 1610 is considered a reflection of colonialism, genocide and the expansion of global trade through the exchange of species and goods between America and Europe. The second chosen date could symbolize the rational control over technological power and its destructive potential since it is immediately after the date of the international treaty that put an end to atmospheric atomic tests.

The second date would be around 1950 and is identified with the Great acceleration.

Finally, the AWG has proposed as the stratigraphic limit for the Anthropocene the beginning of the nuclear age because, as a result of that moment, a planetary dispersion of artificial radionuclides takes place. Between 1945 and 1951 the tests that were carried out with fission bombs, caused the tropospheric entry of radioisotopes in the latitudes in which said atomic explosions were made, being the largest in 1952 and gave rise to the entrance of radioisotopes that were dispersed to along the entire surface of the earth, observing its peak during 1961-1962. (Cearreta, 2015).

4. Consequences and reasons for the change of era:

4.1. Activities of the human being that have become irreversible

The state of the environment is an issue that worries many experts and they have come to the conclusion that there are several factors that have led to the current situation. One of these factors is the widespread contamination throughout the world that reaches soils, rivers, seas and air (Vilches and Gil, 2011). This pollution produces an acceleration of climate change that can make our planet uninhabitable. Another factor is the depletion and destruction of resources, especially targeting fisheries, energy, forests, freshwater and arable land. This would lead to an increase in desertification and a considerable loss of biological diversity. They also point out that there is a generalized degradation of ecosystems from forests and meadows to glaciers and polar ice caps, not forgetting coral reefs. The consequence of this degradation is the increase in the frequency that our planet suffers devastating natural phenomena, as well as the increase of the intensity of hurricanes, floods or the extreme drought of some places.

In today's society the unsustainable imbalances that have been normalized through the capitalism to which we are subjected a fifth of humanity, led to hyper-consumption and linked to an economic growth that is considered as predator are evident. Meanwhile, the other remaining parts of this mathematical operation suffer from hunger and living conditions that are not comparable to those of that small part of humanity. Amparo and Daniel argue that many of these problems are generated by the lack of an adequate educational policy that realizes that the carrying capacity of the planet is reaching its limits. They defend that the consequences of all these imbalances lead to conflicts of all kinds, pointing to wars and that generate a source of unnecessary and totally avoidable pollution of the planet, since, the bombs and all those artifacts that make possible the war conflicts are highly polluting, as well as the previous tests carried out by governments. (Vilches and Gil, 2011)

4.2 Global warming, environment: deterioration and damage, depletion of resources (hunting, fishing, agriculture...)

Our ancestors had all the resources that the earth could provide them, since the planet Earth had not yet been exploited. Thus, they managed to have a considerable development because the fruits of the land were abundant but the abuse, waste and misuse of these raw materials have led to a situation that is believed to be a point of no

return. It begins to raise the idea that the next generations of humans will not know the abundance or simply the satisfaction of their needs, since resources will begin to be scarce due to mass production, to the massacres and extinctions of many animals . It is also true that among the attitudes that can be taken against this fact are several: the apathetic believe that it can continue in this way because over the years it has been discovered new sources of resources and they believe that others will arise again when that are currently known will be scarce or disappear; there are the assets, which constantly seek to educate society about the situation we are witnessing and for which, years later, the whole world will suffer the consequences. To this end, talks are given, the ethics of the company or the way of production is modified in order to try to improve the environmental situation. And finally we find the intermediate step that is dedicated to continue with the daily life to which they are accustomed, completely ignoring the problem and being the product of capitalism (Aragón, 2015).

Due to this excessive consumption of our nature, we can see latent problems in terms of the main resources of the planet, especially in the following sectors:

- Fishing: modern and industrial fishing, which most people currently eat, does not discriminate between adult specimens or fish that have not yet been developed and reproduced in order to continue balancing. In addition, species that are not used for human consumption and even, in some cases, protected species, also known as collateral fishing, are also targeted. This has resulted in the degradation of aquatic fauna by 6% in 1990 and the decrease in the amount of fish, as well as the modification of ecosystems. Paradoxically, the fishing industries are those that most notice the consequences of this degradation that they have caused themselves, because the amount of fishing has decreased and this is reflected in the number of potential incomes they currently obtain, and even in several cases have led to the disappearance of some of them (such as abundant fisheries that were dedicated to deep sea fishing such as cod in Canada). (Criado, 2015) (Frers, 1997)
- Hunting: the human being is the only predator that turns other predators into prey, since, in general, humans do not feed on large carnivores, but they are used as hunting trophies. This means that many species are already endangered. On the other hand, the massive consumption of food makes you hunt more than what humans consume and this causes the hunting to be diminished. The combination of human behavior and technology is the cause of the imbalance of many ecosystems. (Criado, 2015)

- Agriculture: agriculture was an activity developed by man more than 10,000 years ago and which has undergone different transformations. It has contributed to the contamination of the environment, such as, for example, fertilization, which, in addition to contributing to a greater quantity and quality of the foods on which they act, also contributes to the deterioration of the planet's well-being. (García, 2007).
- Water: the consumption of fresh water is growing disproportionately at present, a fact that entails a series of consequences. Only 2.5% of the total water of the planet is fresh water, of which 70% is frozen; that is, only 30% of that small percentage is potable. Currently 1 in 8 people, a total of 1.2 billion people, have no access to drinking water. The consequences that have already begun to be seen are landslides, droughts, famines, epidemics (AIDS, malaria, measles, viral hepatitis...) and floods. (Ascencio, 2011) (Aragón, 2015).

5. Attitudes of entrepreneurs facing the change of era: Corporate Social Responsibility.

It is mainstream to be a committed firm with the environment, in fact this thought has expanded globally and a lot of practices that would downgrade the environment have been punished, for example: INQUINOSA (lindane illegally dumped in municipal garbage dumps) or Volkswagen and Audi (falsification of data of polluting emissions through a software that was implanted in their automobiles and gave deceptive results). Since the law has changed in these terms, the RSC is also changing, they're variables. Topics that one day were voluntary can be mandatory in another moment. Due to the costs that in these cases should be incurred when doing bad business arrangements, it is more profitable to do things keeping in mind that the environment is what enables us to nourish ourselves with resources and good publicity to follow this type of practice, will lead to following the guides of the RSC, that is, corporate social responsibility.

The corporate social responsibility is actions that embrace four areas, which are: the economy, governance, the environment and the social status of the firm. The actions have to be voluntary; if they were mandatory, they would be included in the legal framework, and since they are not they are considered a compliment to this.

The RSC apart from generating utilities for its owners, they are also aware that the business activities have an impact and positive and negative consequences for the environment; as well as the quality of life of its employees and the communities in which its operations are carried out. The final objective of these types of actions is the sustainable development. Each firm has its necessities and therefore will adopt different strategies depending on their characteristics, necessities or shortages that they may have. These models are adopted because they add long-term value to the company.

There isn't only one true definition of social responsibility but we could say that it is the term that encompasses the responsibilities of the company with society. This term begins to be used by the ONU during the 1999 World Economic Forum. Due to the fact that there isn't a final agreement in terms of the definition of such term, below are the definitions according to some environmental corporations:

- OCDE (2000) Uses the concept of corporate responsibility and defines it succinctly as: "the actions developed by businesses to consolidate their relations with the societies in which they operate". According to the OCDE regarding the environment, a

company must take into account the need to protect the environment and health and public safety and to carry out, in general, its activities in a way that contributes to the broader objective of sustainable development.

- Barrera (2007) refers to the proposal of the Department of Trade and Industry (DTI) of the United Kingdom (2002), which mentions that social enterprises are businesses with primarily social objectives, which are not oriented towards maximizing the benefit for shareholders or owners, but that their profits are reinvested in the business itself or in the community. They address a wide range of social and environmental issues and operate in all sectors of the economy. The government believes that social enterprises, through the use of business models that solve social problems, have a different and valuable role to help create an inclusive, sustainable, strong and social economy.

- According to the definition of the Green Book, RSE would be defined as: "The voluntary integration, by companies, of social and environmental concerns in their business operations and their relationships with their interlocutors.

- The Commission of the European Communities of 2002. Being socially responsible does not mean only fulfilling the legal obligations, but also going beyond its fulfillment, investing more in the human capital, the environment and the relations with the interlocutors".

- The Ethos Institute of Business and Social Responsibility (2007), of Brazil, defines that "corporate social responsibility is the form of management that is defined by the ethical and transparent relationship of the company with all the publics with whom it is related, and for the establishment of business goals compatible with the sustainable development of society; by preserving environmental and cultural resources for future generations, and by respecting diversity and promoting the reduction of social inequalities."

- The "Prohuman" Foundation of Chile (2011) mentions that "it is the contribution to sustainable human development, through the commitment and confidence of the company towards its employees and their families, towards society in general and towards the local community, in order to improve the social capital and the quality of life of the whole community".

- The Inter-American Development Bank (IDB, 2007) defines it as "a sustainable business strategy that promotes the well-being of the company and of society in general."

- The Business Forum Network (2011) points out that, although there is no single

definition of RSE, it generally refers to a business vision that incorporates respect for ethical values, people, communities and the environment.

- The Mexican Center for Philanthropy (2009) defines the term corporate social responsibility as "fully comply with the purpose of the company in its economic, social and environmental dimensions in its internal and external contexts".

This responsibility leads, therefore, to the conscious and committed action of continuous improvement. This consistent measure allows the company to be more competitive while respecting and promoting the full development of people, the communities in which it operates and the environment, meeting the expectations of all its participants, investors, employees, managers, suppliers, customers, government, social organizations and community. (Soto, 2015) (Muñoz, 2006)

Economic consequences of taking CSR positions:

A good social performance usually implies a good financial performance. The companies evaluated positively following SR criteria stand out for the strength of their governance and control systems, for the capacities to manage crises and seize opportunities, for their respect for the environment or for their transparency and relationship with the interested parties (in short, for good business management practices). Increasingly, there is a tendency to identify the concept of sustainability or corporate social responsibility with that of a well-managed company, oriented towards the future and focused on the creation of long-term value. Sustainable management is also a process of integral risk management.

According to the OECD, a company must take into account the need to protect the environment, health and public safety, as well as to carry out, in general, its activities in a way that contributes to the broader objective of sustainable development. (Soto, 2015) (Muñoz, 2006))

6. Capitalism of nature:

6.1. Ecological social resistances and Boomerang effect of Gaia.

Global capitalism has as a characteristic that it has an endless growth, since competition imposes itself before cooperation. It is impossible to completely separate the competition from cooperation, since without this last the biosphere would be increasingly smaller, due to the expansion of our species and the living space of some species would be affected to the point of evolving into simpler and specialized ecosystems. In this way, it can be said that capitalist expansion must take into account two areas: nature and domestic space. Both areas are at the limit of their capacity, the nature of the ecological crisis currently underway and the domestic space due to the crisis surrounding care and reproduction..

Sachs (2001) defines the power of global capitalism from the ecological point of view as "the ability to internalize environmental advantages and externalize environmental costs". And it is precisely this affirmation that makes us understand that the impoverished countries are those that really suffer the ecological impacts, since, the central spaces are importing sustainability and hoarding biodiversity from the rest of the world.

The appropriation of planetary biocapacity is reaching its ecological and sociopolitical limits. The limits are found in the borders where the civilized world and the peasant and indigenous worlds coexist, which defend their way of life and the environment that surrounds them. Precisely in those places is where the last non-renewable resources are located and the main biodiversity reserves would suggest that they have not yet been exploited.

At the end of the 20th century, the world agro-industrial system was beginning to collide with biophysical limits and the global ecological crisis was already a fact for those who wanted to see it. In the twenty-first century these ecological consequences were already clearly visible. After a brief but intense period of expansion of global capitalism, the current global crisis broke out, which was determined by means of biophysical limits and as a result the explosion of indebtedness at all levels was obtained. Even so, the level at which it deepened the most was in the ecological one, due to the expansion in terms of land that the real estate bubble implied.

The summit that took place in Copenhagen was not very successful, as it was insisted that there was not a B planet to continue growing like business. The financial market itself has been able to be fixed by injecting huge amounts of money but the disarray

and the worsening of the environment is not resolved in the same way; in fact, it is irreversible. According to Fernández Durán (2011) "this event will lead to collapse in this same century that will have repercussions for civilizations. The factors that will influence this terrible scenario are: the resilience and social transformation of different human societies in the face of power structures that will most likely also succumb in the medium and long term as part of a civilization that is exhausted." (Durán, 2011)

6.2. Global capitalism capable of altering the global

At the end of the 20th century and as we have seen in the previous section, global capitalism was being able to modify the planetary climate. In this period, the human species was already occupying 40% of the planetary biomass (Carpintero, 2005). The Homo sapiens of the industrial society was occupying and appropriating all the environmental space it could without taking into account more factors than expanding. This fact supposes a worsening in the conditions of the rest of species, whose number and vital territories was being reduced by it.

We are in a case of ecological deficit, since, the ecological footprint indicates us that the total territorial requirements of the socioeconomic metabolism of the world urban-agro-industrial systems are superior to the biocapacity of the territories. This ecological deficit needs to be solved in some way, in order to guarantee the future operation of it.

At the end of the 20th century, on a global scale, there are calculations in which it is affirmed that the urban-agro-industrial system was above its planetary biocapacity (around 20% above it). This fact implies that society at that time was overusing and overexploiting the goods and services offered by nature, to the point that the biosphere would cost 1.2 years to regenerate everything that has been extracted from more to return to be in the point of balance. (Durán, 2011).

6.3. The capitalization of nature.

The degradation of the environmental services of nature has led to this new action plan and to open a new and huge market in order to allow access and enjoyment only to that population or industrial activity and services willing to pay for a right that has been freely enjoyed until now. On the other hand, compared to those populations that are monetarily rich and could acquire that part of nature that corresponds to them by

geographic limit, would be those populations that do not have purchasing power, which would be excluded from their use by right they had until then.

All these consequences would be under the excuse that in this way it would be easier to preserve what remains of nature, because according to Murray (2005) its destruction will be avoided when conserving is more profitable than destroying. To make the message more credible, they try to include NGOs in this campaign in order to transmit a more secure message.

Huella ecológica 1961-2001

Medida: planetas equivalentes (Loh, 2004)

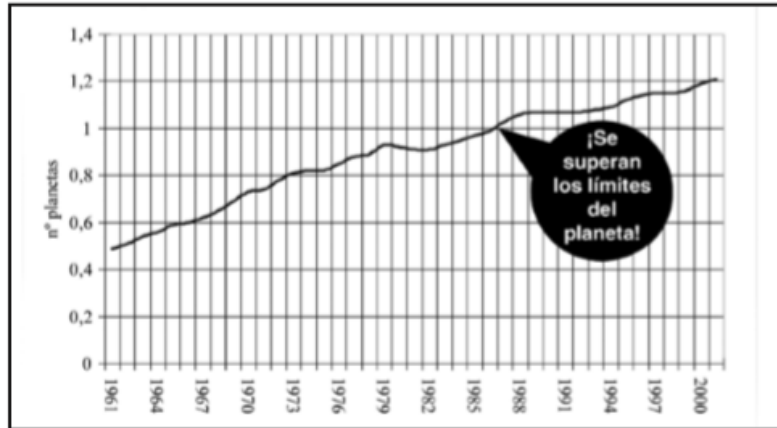


Figure 2. Murray, 2005.

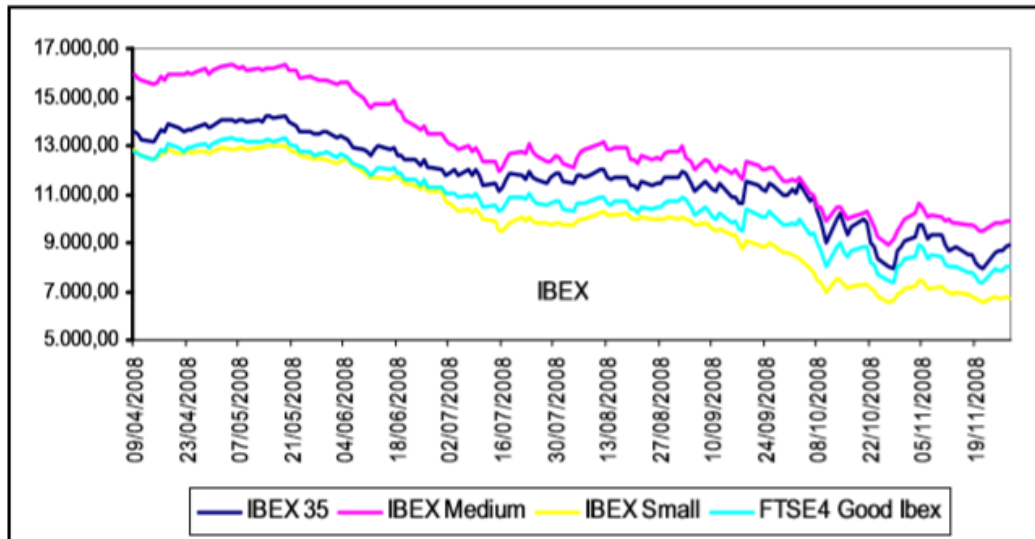
7. Figures:

7.1 Anthropocene and its affectation to the financial system.

As we have seen in previous points, social and environmental criteria are increasingly influencing the form and quantity of investments and financing. For this reason, the followers of the so-called socially responsible investment (SRI) have increased since the 1990s. Due to this increase, new types of stock market indices have been formed that only and exclusively include companies that meet the requirements of corporate social responsibility (RSC). These indices are: FTSE4Good IBEX and Dow Jones. The rating agencies that decide if a company collects these requirements are several. Among the most important are: EIRIS (Ethical Investment Research Service), SAM and SiRi. The positive requirements and therefore those that favor inclusion in the aforementioned stock indexes are based on aspects related to environmental sustainability, such as policies and codes of conduct, environmental systems or climate change, as well as the defense and support to universal human rights and positive relationships with stakeholders.

Companies that meet the requirements of CSR are easier to get funding, because they also benefit from being able to access the volume of socially responsible institutional investment funds. It is considered that fulfilling this condition has an additional influence, as it serves as a study for investors, since they associate this characteristic with the responsibility of the company to improve the quality of management of the company (Maignan et al. 1999). It is also considered that it will incur lower costs derived from the risks of irresponsible social behavior. For this reason, several studies support the idea that being responsible with the environment is directly linked to business profitability (Margolis and Walsh, 2001, Garz et al 2002).

But the big question is whether being responsible with the environment positively affects the profitability and future of the company, since, as a result of climate changes and especially the change of era, this practice has gained importance in all areas, including the financial. To answer this key, several studies have been carried out in which companies that are included in the FTSE4Good IBEX are compared and therefore are considered socially responsible and other companies that are not within this group of companies belonging to that index.



Fuente: Elaboración propia

Figure 3. Molina 2010. Evolution of: IBEX 35, IBEX medium, IBEX small y FTSE4Good IBEX.

In the study on which this work has been based, a short period of time is analyzed (from 09/04/2008 to 19/11/2008). The following table shows the evolution of socially responsible companies with respect to the other IBEX indices. In this graph you can see the decline caused by the crisis and that affects all indices in the same way. That is, there is a high relationship between the four indices that have been chosen; 87 of the 32 companies that are considered socially responsible. The results obtained from a series of calculations by the author lead to a series of conclusions that will be presented below.

Socially responsible companies enjoy an alpha coefficient higher than those that are not included in the FTSE4 index, that is, the actions of "green" companies have an additional return to their systematic risk. For this reason, they consider a better investment opportunity by providing greater profitability than the one that corresponds to their risk. On the other hand, the Beta coefficient is also higher in the companies that this work has focused on, with 0.82 and 0.69 for those not included in the index. This higher coefficient means that they present a higher systematic risk, since they react with greater sensitivity to the market oscillations and therefore have to accept a higher market premium. Anyway, this type of companies are not considered aggressive investments, therefore it is considered that in the face of the oscillations they present a defensive attitude towards the downward movements of the stock market.

Regarding volatility, the conclusion reached is that no statistically significant differences have been detected between the two groups. Therefore, it could be said that both groups present similar levels of risk.

The profitability obtained by the owners of the companies that are part of the responsible index measured by the ROE ratio, says that the difference between the two ratios is not significant, since a difference of 0.02% separates it. That is to say, the profitability obtained by the owners of the companies that are part of the FTSE4 and those that are part of the IBEX is practically the same. In the same way, it is considered that the data are not significant in terms of the book value price of the shares of both groups, the average value of the CSR shares being 6.96 compared to 5.98 for those excluded from the index of responsible companies. The result that is added to the non-significance is that related to the benefit per share, which on the contrary to the other results, in this case the socially responsible companies are slightly below those that are not considered of that group.

In conclusion it can be said that the growing interest in the financial and business world for the issues of corporate social responsibility as a result of considering that we have entered the Anthropocene, has encouraged the business society to get involved in environmental issues, so that be considered more responsible and give an image of greater confidence in the financial system, trust necessary since the economic crisis was declared.

Although companies do not want to lose profitability for being better for the environment. For this reason, the aforementioned work has been carried out to answer the question of whether CSR companies have a lower profitability. In response to this question we will say that there are no significant differences in terms of this statement, since both groups present similar figures and results, taking into account, however, that environmentally responsible companies are more sensitive to market fluctuations, due to part to take measures for all changes and therefore adopt a higher premium, that is, are not as static as those who do not care about the environment.

Finally, it can be said that companies that adopt good practices for their environment are as profitable as those that do not care about the future of the planet. Therefore, the savers who finally decide to invest in FTSE4 securities are not penalized in terms of profitability. (Molina, 2010).

7.2 Companies responsables with the environment



Figure 4. (Bolsamadrid, 2011) FTSE Group and Spanish bags and markets. First five components of the FTSE4Good IBEX index.

This table shows the companies that today are considered the best in terms of capitalization in the FTSE4Good IBEX index. The names of the companies that were most valued in this index are: Telefónica, Banco Santander, BBVA, Iberdrola and RESPSOL YPF.

Currently, Telefonica has a global environmental strategy adopted by helping the green economy. It has been adopted also to help decoupling between business development and its digital impact to help its clients to reduce the environmental footprint that has brought us to present situation and commitment in presence of environmental challenges for the change of greenhouse gases (GHG) end up disappearing. (Telefónica, 2016)

Banco Santander's mission is to contribute to the progress of people and companies to get to be the best commercial bank with a strong commitment to the environment and climate change. For this reason, Santander Bank promotes the protection, conservation, recovery of the environment and the fight against climate change. Because he has carried out an awareness study, people are aware that the preservation of the environment has positive social and economic impacts as well as offering important business opportunities. To do this, it establishes a series of operating criteria in terms of defense, energy, water and forestry, which inspires a better practice and ensures that it is of equal application for the whole group. Their initiatives are focused on controlling and reducing the consumption and emissions of the facilities; the analysis of social and environmental risk in credit operations; finally, the development and promotion of financial solutions that protect the environment, such as renewable energies and energy efficiency. (Santander, 2017)

BBVA (Banco Bilbao Vizcaya Argentina) publishes its environmental policy on the bank's website and maintains that it reveals its strong commitment with the environment and, this bank, is willing to contribute with their all efforts to try to make more sustainable society. It also affirms that BBVA has an active attitude around mitigating Climate Change. It participates in the World Energy Day with a purpose that it is to raise awareness about the importance of responsible consumption and commitment to promoting the use of cleaner energy such as wind, solar, etc. Since 2014, 100% of the Group's electricity supply has a renewable origin. On the other hand, BBVA tries to stop the use of energies that are based on fossil fuels such as coal and oil.

At present, BBVA has put all its efforts into defining its third Global Eco-efficiency Plan by 2020 with several clear objectives:

- Be in leading positions worldwide in terms of eco-efficiency.
- Encourage the use of clean energy.
- Reduce indirect emissions of greenhouse gases.

(BBVA, 2018)

Iberdrola is another of the companies that as we have seen in the previous table it is in the highest points of the capitalization of the stock-market index of the companies that are considered responsible with the environment and as such it has a policy regarding this issue that leads carried out with great rigor, with the purpose of projecting to all its stakeholders the development of clean energy and respect for the environment. To achieve these goals, Iberdrola tries to develop clean energies through investment in smart grids and other energy efficiency technologies to try to differentiate itself in the energy sector. (Iberdrola, 2016)

In the fifth place, is Repsol. This company tries to manage natural resources in an integral and responsible way. It highlights its commitment to protecting the environment in its operations, as well as the contribution it makes to sustainable development through the responsible management of risks and environmental impacts.

Repsol's environmental objective is to contribute to the objectives of sustainable development through its sustainability plans aligned with the Sustainable Development Goals of the United Nations (ODS). Their efforts are focused on making efficient use of natural resources with active actions in terms of maintaining clean and healthy water, making a responsible management of water resources to reduce their demand and

preserve their quality. Responsible production and consumption take care of underwater life and take into consideration the life of terrestrial ecosystems, are other points in which it puts special effort to improve the environment (Repsol, 2018).

8. Conclusion and future lines of research.

There is a close relationship between the deterioration of the environment and consumerism or capitalism, to which today's society is subject. Throughout the beginning of the nineteenth century to the present, capitalism has managed to turn desire into necessity, since what is now, in previous times, considered a desire is now called necessity. For this reason the mass production appeared and with it many of the consequences that have been cited and explained throughout this work.

The consequences of twentieth-century society, or rather since the Anthropocene began (which will be in this case with the emergence of the Industrial Revolution at the beginning of the nineteenth century), are evident and worrying, reaching the situation in the that the Earth is at the moment and which is considered of no return, since, the magnitude of contamination to which we have taken to our environment is such that the natural resources that we possess cannot be restored at a sufficient pace to endure the overproduction and overexploitation to which human beings are subjecting our planet.

The main resources that are being punished the most are fishing, reducing the number of fish and other marine species; hunting, causing a mismatch and worsening of ecosystems; agriculture is being affected by the introduction of strong pesticides that deteriorate and pollute our environment; and water, which although it is a limited good, in many cases toxic products are spilled and reduce even more in a greater quantity said good.

Some entrepreneurs choose not to be responsible with our environment, perhaps because they see the disaster much further than it really is, or because they believe that their actions have no direct consequences in terms of increasing the level of global pollution. Fortunately, the mentality of the "green business" is increasingly being extended or as has been cataloged in this work, the company that follows the CSR standard, that is, it is a socially responsible company with the environment. Currently being a company that pays attention and meets the needs of their environment has no problem. On the contrary, as has been observed throughout this work, today, you get greater benefits compared to companies that are listed as irresponsible in this regard and is that the law, at this time, punishes with great fines those companies that commit crimes against the integrity of our planet. However, those companies that consider the environment as a part of their active strategy, are better valued in terms of brand image and for their consumers, since

the mentality of being responsible and caring for our environment is increasingly present in the society. This fact has been possible due to a change in education and a very important movement of awareness on the part of companies, government and other entities that have put all their effort into making everyone aware that any action is important and the future consequences which can lead to environmental crimes being carried out. Consumers increasingly exist on this issue, even to begin to change the habits of food and the demonstration against acts that attempt against the integrity of the Earth.

Regarding the financial issue, as has been observed throughout this work, the difference between a responsible company and a non-responsible company is very small, with the company cataloged as responsible having greater benefits, since, although the quote and income do not vary greatly, (the results are not significant, compared to a company with similar characteristics but without applying "green" strategies) the image it gives and the prestige it has with its consumers is an intangible asset to which it can also be given a certain value, in addition to the fact that these companies can compete in a market that cannot be reached by the non-responsible company.

The future is to be totally committed to the environment. Resources are increasingly scarce and in the end there will be no alternative, as the law is increasingly strict on this issue. Although on the other hand, capitalism struggles in a direction very contrary to CSR, since they are in a continuous struggle of interests. A company is interested in obtaining the greatest benefits it can, often leaving responsibility in the background; this is achieved with a mass production, capitalism. In addition, many of the most precious resources on this planet have been privatized and in the future the same is expected to happen with water, thus hiding the fact that capitalization is reaching unsuspected extremes and has no limits. Soon you can buy shares on the water or buy a piece of ocean, because the authorities will say that this way you can better control the amount of fishing, its quality or ensure excellent care, as mentioned at the beginning of this section. The desires are turning them into needs and all for the art of capitalism. This is not the only issue to which this phenomenon is directly linked (with pollution or deterioration); in fact, deforestation also has much to thank capitalism, as well as the worsening of all types of ecosystems. And is that this new model of life has the days counted if it is intended to preserve the place that has harbored prehistoric lives and that right now, man has managed to change the era because his presence is irreversible for our world. It has left a mark on him and in many cases, a bad reputation, adding to the curriculum of the

Anthropocene mass extinctions similar to the extinction of dinosaurs 65 million years ago. (Irwin, 2011)

On the other hand, not everything has such a demoralizing aspect, since it is expected that there will be a new economic transformation experienced. This is what some experts call outsourcing and advances in the Quaternary sector or, in other words, the era of knowledge. In this new transformation, it is expected that some developed economies will be found, carrying out technology, information, development and research activities. It is expected that some of the great advances that are going to be achieved are to try to preserve some natural resources that are currently seriously affected by human activity, as well as to try to eradicate the costs of pollution, deterioration and damage year after year, humanity has been responsible for realizing, putting at risk the continuity of life on planet Earth, making it clear that the human being is the one who dominates the Earth.

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