CRISIS MANAGEMENT: A STUDY OF CLIMATE CHANGE AND THE POSSIBILITY OF REDUCING ITS IMPACT ON THE ECONOMY USING SUSTAINABLE FINANCE

Research dissertation presented in partial fulfilment of the requirements
for the degree of
MSc in Accounting and Finance Management

Griffith College Dublin

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Date of submission 28/08/2020

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submitted for the degree of: **MSc in Accounting And Finance Management** is the result of the my own work and that where reference is made to the work of others, due acknowledgment is given.

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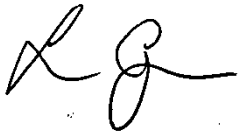

Date: 28/08/2020

Acknowledgements

First and foremost, I would like to thank my mother Marineia and my brother Davi for all their support and love. I could not have done anything without you, thank you for supporting my decision of studying abroad.

Secondly, I would like to thank my partner Brian for his partnership, patience, and love, and his family for all the encouragement. I feel especially lucky and grateful for being part of this family.

To my supervisor Louise Gorman, my deep gratitude for all her support and guidance. Finance has always been an enjoyment, having her expertise and professionalism during the process of this dissertation was vital.

I also would like to acknowledge all my colleagues of profession that I have met in my career in Financial Services, as well as all the professionals I have met during the Master's in Accounting and Finance Management. A special thank you to Jovanna and Keith who have accompanied me throughout this course and have become great friends.

To finalize, thank you to all Griffith College Dublin professors. Doing a master's in a language that is not my native was a big challenge, I could not have gone through this without your patience and guidance.

Abstract

CRISIS MANAGEMENT: A STUDY OF CLIMATE CHANGE AND THE POSSIBILITY OF REDUCING ITS IMPACT ON THE ECONOMY USING SUSTAINABLE FINANCE

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Climate change has been recognized as one of the biggest challenges of current times and has become a topic of considerable study and debate. It is predicted to have irreversible impacts on the ecosystem; however, climate change should also be considered a potential threat to the world economy if not properly and effectively addressed. This research attempted to contextualize climate change as not only a corporate social responsibility concern, but mostly as a crisis management issue, as well as to identify sustainable finance as a part of climate solution. The study is divided in two. Firstly, a survey was delivered to the public to assess climate change awareness and perception around the world. Secondly, a case study was conducted to analyse how Australian and French financial institutions are conducting and addressing climate change-related risks, as well as to analyse how the governments' actions can influence those businesses. The governance of private and public institutions should be accountable to incorporate the environment into decision-making; stakeholders are responsible to ensure that initiatives are implemented.

Keywords: ESG, climate change, crisis management, stakeholders, financial institutions

Table of Contents

List of Tables

List of Figures

1 Introduction

1.1 Overview

Amid a globalized landscape, climate change, global warming and sustainability are among the most addressed topics in the recent years and, collectively, are seen as one the greatest challenges facing contemporary society (EEA, 2020a). Threatening the current and future generations to come, it has been addressed within political, environmental, and economical agendas.

The chapter will offer some background into the research topic. The purpose of the research is then explained before presenting the specific objectives in the context of the significance of the study.

1.2 Background

Much of the climate change currently experienced is caused by human actions such as pollution, deforestation, livestock farming, usage of fertilizers and the overconsumption of non-renewable resources such as uranium, coal, oil and natural gas (Jackson, 2020). Temperatures are continuing to rise, precipitations have become heavier and hurricanes stronger, the acidity of our ocean waters surface has increased, the effects are diverse and yet, policy makers are prone to implementing short-term risk approaches, leaving out issues that may affect succeeding generations.

Understood as a significant risk to business, recent studies have shown that if Climate Change is not addressed correctly, and counter measures put in place now, it will create significant costs in the future (Auffhammer, 2018). This concern not only relates to general society and the environment, but it is also an immediate threat to financial regulators as the economic costs to cover natural disasters, for instance, have become astronomical. For example, Australia's bushfires, which started late in 2019, are predicted to be the worst fire catastrophe in history, having an estimated insurance loss of 1.3 billion dollars, and amounting to $4.4 billion of direct loss to the economy, which are yet expected to increase (AICD, 2020).

Costs arise from insurance, loss of life, environmental damage, damage to private properties and public infrastructure, disruption to education, tourism, and other services, resulting in unemployment and broader societal costs.

A decade since the Financial Crisis, society has become more financially literate. Simultaneously, society has come to watch the actions of companies carefully, seeking for changes to practices which harm the environment and accelerate climate change(Saha and Viney, 2020).

According to a survey Deloitte conducted with 1,168 CFOs in December 2019 (Deloitte, 2019a), there is now more pressure from stakeholders to act. Many researchers believe that a company's behaviour is directly affected by the pressure stakeholders apply on organizational decisions. The effect is even more powerful when it is a case of environmental practice and performance (Helmig, Spraul and Ingenhoff, 2016). Investors are looking to invest in companies which have an acceptable environmental performance, seeking not only a financial return but also investments that have social or environmental benefits. On the other side, it is also a concern to employees who are now demanding companies adhere to more ethical practices.

Although the study of climate change has become more prominent, there is still a lack of understanding when assessing and measuring climate related risks and the potential financial impact resulting from them because of their longer-term characteristic comparing to the traditional business risks.

Businesses do have the opportunity to increase their performance using the green market trend from simply adopting a more efficient technology to improve energy efficiency in daily processes, to implementing a new range of "green products". Green Financing may be defined as the financing of environmentally sustainable growth. It involves financial instruments or investments that brings environmental benefits, thereby contributing to long term sustainable activities such as reduction of carbon emissions, reduction in water and land pollution, and prevention of severe events caused by climate change (OECD, 2017a).

The Global Sustainable Investment Alliance (GSIA) assessed that in 2018 more than US$30 trillion in funds were detained in green investments in Europe, Canada, Japan, The US, Australia and New Zealand, which represents a 34% increase since 2016 (GSIA, 2018)

All in all, Climate Change is followed by many risks and opportunities to businesses, however only those able to respond and adapt quickly will be least negatively impacted if the financial system collapses due to environmental risks. The areas of main

relevance to this paper are strategic financial management, audit and assurance and corporate governance.

1.3 Research Purpose

The proposed title for this project is "Crisis Management: A study of climate change and the possibility of reducing its impact on the economy using sustainable finance". This research seeks to answer how climate change might result in a financial crisis if not correctly addressed by financial regulators and corporate responsibility bodies. Furthermore, it aims to examine how risk management and strategic planning may be used to incorporate or ameliorate the concept of environmental responsibility within business, and how investors can encourage companies to change their practices with regard to their environmental impact.

Specifically, the researcher aims to understand what climate change represents to individuals and their perception of the policies put in place to tackle the problem so far. That understanding is reached by assessing if some companies have not yet implemented more sustainable practices to their responsibilities, and to analyse the opportunities that sustainability presents to the financial markets through green financing.

1.4 Significance of the Study

Based on observations of professional practice and societal behaviour, the author believes that managers, regulators, shareholders and general public need to pay more attention to environmental changes.

It is a long-term risk to businesses and for that reason natural disasters are not the principal concern when creating a crisis management plan. Managers tend to focus on the short-term risks only which is a huge lack of foresight because even though change in climate in not considered an immediate hazard, small incremental changes over time can result in the loss or migration of whole cities.

For example, in January 2010, Haiti suffered one of the worst earthquakes in its history, hitting and destroying the west of the capital Port-Au-Prince. It is estimated that 230 thousand people lost their lives, another 300 thousand were injured, and over 1 million ultimately ended up homeless.

The findings derived from this research are anticipated to be of relevance to governments, companies, financial regulators, investors, and any individual with particular interest in the topic. As a result of Globalization and the rapid development of technologies, the necessity of cross-border trade of commodities and services is higher than ever. Climate Change needs to be addressed by individuals, but mostly by public and private sectors. To change not only the way natural resources are utilized to produce goods, but also how prepared we are for circumstances beyond our own control.

As mentioned earlier in Section 1.1, the intended outcome of this research is a comprehensive understanding of the financial impact natural disasters represent to business by the identification of climate events that resulted in large economic losses to companies and governments, as well as to understand how that impact can be reduced through green financing.

1.5 Research Objective

Not having a deep understanding of the risks natural disasters pose to the economy, makes it nearly impossible to prevent assets from falling in price and to make strategic investments. Therefore, investors, now more than ever, pressure companies to tackle the hazardous changes in climate. It is necessary to persuade global businesses to commit with real action to avoid environmental damages. Every company, irrespective of size and sector, should be considering global warming as part of their decision-making process to identify opportunities and to mitigate threats. Also, businesses should be considering climate risk management and climate related financial disclosures as part of their strategy by taking responsibility for climate change and accountability for their effect on the environment.

Analysing data as Corporate Responsibilities in relation to Climate Change – mission, vision, financial statements; and assessing current green investment policies, the main objective of this research is to identify how companies and governments have been dealing with climate change and to propose recommendations for tackling climate change through sustainable financing.

1.6 Structure of the Study

A survey and a case study are used for the collection and analysis of data. The author assesses government reports on climate change and on the economic impacts of natural disasters. Further companies' annual reports are evaluated, with a particular focus on the financial resources that companies devote to managing their environmental impacts, and narrative reports related to sustainability, climate change and ESG. The research also examines news media reports related to natural disasters to achieve insight into the broader context.

Different techniques are utilized when analysing primary and secondary data. The author proposes to use a nominal and ordinal scale to analyse primary data and horizontal and vertical analysis for secondary data.

When the survey is completed, the author analyses the information putting them into different categories to identify commonalities. These categories enable the researcher to understand what the individuals' perception are of each one of the categories and if there is a common "reality ground" between the answers, and eventually help to reach a conclusion.

Both primary and secondary data analyses are essential for the outcome of this research which will be explained in the potential outcomes section.

2 Literature Review

2.1 Introduction

This chapter examines and critically assesses extant research in climate change from a financial perspective. Specifically, this chapter reviews literature on businesses and governments' actions before, during and after a potential crisis through crisis management. The financial crisis of 2008 is reviewed in order to consider how the current climate crisis poses risks to the economy. Furthermore, it assesses how companies and governments have addressed the issue by implementing sustainable finance policies. In doing so, the relationship between business and climate change is evaluated, as well as analysis of policies that were created to tackle this growing concern.

2.2 Corporate Responsibility and Climate Change

Climate change is considered one of the biggest challenges of current times (EEA, 2020b), as a result it has been broadly discussed within the political, economic, and social environment. Specialists believe that if society does not work together on reducing our collaborative environmental damage, the earth will not be habitable as there will be a lack of basic resources for food production, rising sea levels will wipe out many island nations and low lying countries, innumerable species will go extinct and so on (Jackson, 2020). Accordingly, research into the measures taken to address this crisis is crucial in order to safeguard the future coexistence between humanity and its environment.

This is no longer a concern only for scientists and general society; governments and companies are amongst the most accountable for addressing the problem and seeking solutions. Even though it has been on agendas around the world, climate change has not been addressed by companies with the gravity it deserves. It is essential that businesses initiate, and engage in, discussions to evaluate methods to slow the process down. It is within their own interest as companies will be affected not only by the changing of climate itself, but also by related environmental policies.

Firms have been criticized over their practices when it comes to the environment since the 1960s, which has resulted in a duty to reduce energy and water consumption. Corporations are often charged with addressing climate change and revising their

practices as they represent 40% of the largest economic entities in the world (Wright and Nyberg, 2017).

Studies have shown that the economic impact derived from climate change reduces global GDP by 0,3% per year. This figure might be much larger when the earth's annual global temperature rise more than 3°C, resulting in governments creating policies to decrease greenhouse gas emission as well as implementing emissions trading regimes (Llewellyn, 2007). Specialists estimate that the investment in infrastructure will sum up to about $90 trillion by 2030 to mitigate change in climate following the Paris Agreement protocol (*KPMG Ireland*, 2020).

Even though it seems that some progress has been made, the transition to green finance still faces many challenges such as whether the financial system can mobilize capital to fund this transition, as well as how can they provide differential financing rates to companies that implement policies and act to protect and improve the environment. There are also many opportunities when enhancing sustainable finance, for example, it could enable green industries to grow, creating green technology innovation and business prospects for the financial sector (OECD, 2017a).

Business for Social Responsibility (BSR) is a non-profit organization which works together with companies developing sustainable business strategies and solutions. Suggesting that companies should implement climate change adaption strategies (BSR, 2011), BSR recommends that companies should develop systems to assess the risks and opportunities that climate change offers to their operations, as well as evaluating investments directly related to those risks. In addition, the report recommends that businesses interact with their strategic partners to create safeguards to tackle the vulnerability of the risks evaluated. Furthermore, it suggests that developing products with an incentive for climate change adaption is a successful way of using green investments to benefit the environment, for example the Deutsche Bank's developed a research platform[1] at the time to provide guidance to customers investing in agriculture. Using strategic investments and products, companies can avail of incentives, creating innovation and modification and contributing to a better-prepared society.

[1] Deutsche Bank 2011 CSR report, page 27.

While corporate responsibility is an approach taken by businesses, governments play significant role in CSR by creating and enabling policies and conditions for businesses to act. These conditions should enable and encourage business activities to minimise social and environmental impacts while maximizing profits.

Freeman (1984) assesses that a stakeholder in an organization is defined by any individual who can affect or who can be affected by the organization's actions. Integrating stakeholder and CRS perspective to a corporate strategy enables a business to respond to different trends in society such as globalization, changing in technology, and to increasing expectations of social and environmental concerns beyond profit maximization.

Normalizing the idea of climate change with corporate practices enables companies to acknowledge both market expectations and requirements arising from technology innovations. Internal restructuring of these corporate practices is the first step businesses can take to address the problem; redressing company actions comes next.

2.3 Financial Crisis

The financial crisis ought to be considered for a better understanding on how crises impact the economy. The literature on this topic varies from analysing financial crashes caused by sharp macroeconomic instability, to disruptions of financial systems caused by the absence of regulations. The crisis is characterized by indicators such as unexpected variation in a range of asset prices and credit instruments; liquidity and solvency issues in large businesses, considerable disruptions in credit markets, exceptional monetary and fiscal measures put in place to tackle the impact of economic downturn (Zanalda, 2015).

To evaluate how climate change could lead to another financial crisis it is necessary to analyse this previous event. As a recent example, driven by a failure in the mortgage system, the financial crisis of 2008 - also known as the global financial crisis - is considered by most economists as the worst event since the Great Depression of the 1930s. It began with the housing market crisis and growth of mortgage defaults in the US, and later developed into a large-scale recession exposing many problems in the financial system (Helleiner, 2011).

Helleiner explains that several hedge funds collapsed early in 2007, which brought wide concerns about market exposure of various financial institutions in the United

States and Europe that had massive investments in mortgage-related financial products. By mid-September when panic had already affected retail, Britain saw its first bank run with Northern Rock since the nineteenth century. In March 2008 when the State had to rescue the largest investment bank Bear Sterns, public lost confidence in the market which caused the economy to total collapse. The U.S investment bank Lehman Brothers were forced into bankruptcy and the world's largest insurance company American International Group (AIG) saw its rescue and nationalization by the U.S government.

At that time, Queen Elizabeth II questioned how economic experts had not seen the crisis coming (Greenhill, 2008). Some of the most known financial institutes collapsed during the crisis, the ones that survived had a massive state support. Considering that the global economy is interconnected and the strong influence of US financial institutions, it affected many other countries becoming a global financial crisis.

Due to all the difficulties, American and European banks had no other alternative but to remove their international loans which sparked severe financial problems in countries around the world. Countries where financial systems were already vulnerable due to any other issue were impacted by the crisis particularly strong.

The Queen did ask what many other people did not understand, if all the evidences were there proving that the system was about to collapse how nobody acted on the issue to mitigate a crisis that was about to affect the world as a whole. The same has been happening with climate change. It has the potential to cause a largescale decline in the value of assets due to problems as such slash and burn agriculture, flooding, rising sea levels, more aggressive hurricane seasons and costal erosion (FitzRoy and Papyrakis, 2010). Yet, companies and governments have only started creating serious initiatives not so long ago.

The most exposed financial institutions are the insurance companies, as other businesses seek insurance when catastrophes occur making it extremely difficult to offer a cost-effective financial protection. If the insurance industry collapses, it could mean another major failure in the financial system as these institutions play a vital role in the world's economic performance, as well as leaving individuals and business uninsured. These companies may increase their prices due to risk assessment to be able to survive in the market. In 2018, insurance companies in United States alone had

an expenditure of $49,5 billion to cover losses from natural disasters (Saha and Viney, 2020).

Insurance loss is only one aspect of the financial damage that dramatic changes in climate potentially represent to the economy. The issue may have pervasive consequences that will also affect the supply and demand for commodities and services in all areas of the economy and the only way to minimize that impact is to have a proper crisis management system in place.

The ongoing health crisis due to COVID-19 have now also become an economic crisis according to specialists (Fraser, 2020), as governments actions to mitigate the spread of the virus will have a long-term effect on the economy resulting in business closing and, therefore, unemployment. The article also states that international tourism will be down to 45% to 70% this year and it can take years to recover as people's confidence in travelling has to be recovered. Domestic tourism will grow; however, it will not grow enough to cover the loss.

PWC (2020) has shared the key areas businesses should be focusing on during the coronavirus pandemic to respond to the uncertainty society has been experiencing. Some include crisis management; finance and liquidity; tax and regulation; and strategy. The company affirms that the way a business respond to a crisis is essential to keeping public confidence and business continuity. A company response today will reflect on the company position in the future.

2.4 Risk to Financial Stability

Climate change is no longer considered a future threat as some effects of this long-term risk are already being felt. Even though economic impacts are predicted to be far worse in the years to come, physical and transition risks are more imminent (Hale, 2020).

As illustrated (Figure 1), physical risks are risks resulting from extreme acute or chronic natural disasters events, causing damage to property, infrastructure, and land. Transition risks are those resulting from mitigation challenges such as risks associated with GHG emission reduction policies, which naturally impact the economy as companies are required to comply with a low-carbon transition. For insurers, liability risk is also important as it refers to risks of compensation for losses arising from physical and transition risks (Grippa, Schmittmann and Suntheim, 2019).

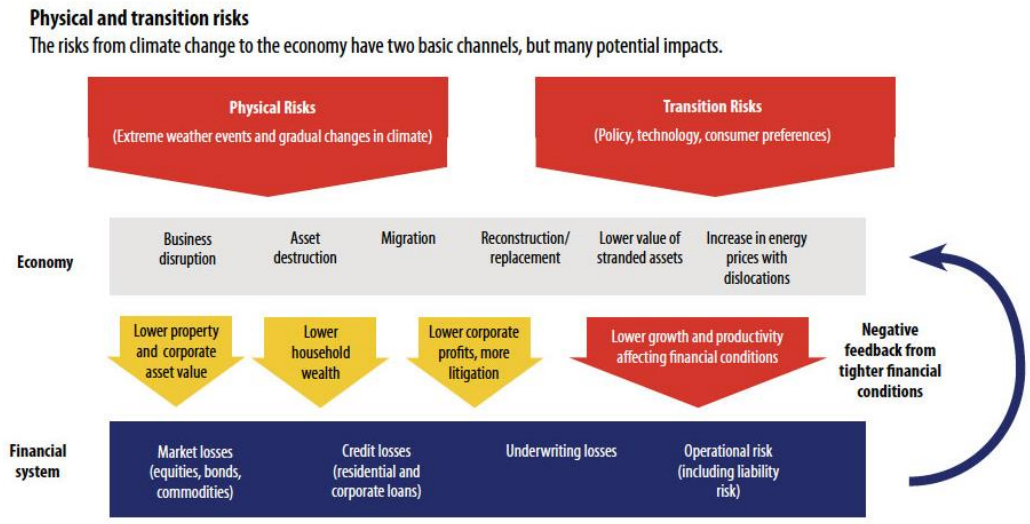

Figure 1 - Climate-related financial risks. Source: (Grippa, Schmittmann and Suntheim, 2019)

Deloitte pointed out that banks and other financial institutions such as Insurers must collaborate with regulators and policy makers to assess and address financial risks related to climate change, assessing that there is an immediate need for these companies to re-design governance, policies and procedures (Deloitte, 2020). Over the last five years, developments have been done on climate change financial regulatory framework (Figure 2).

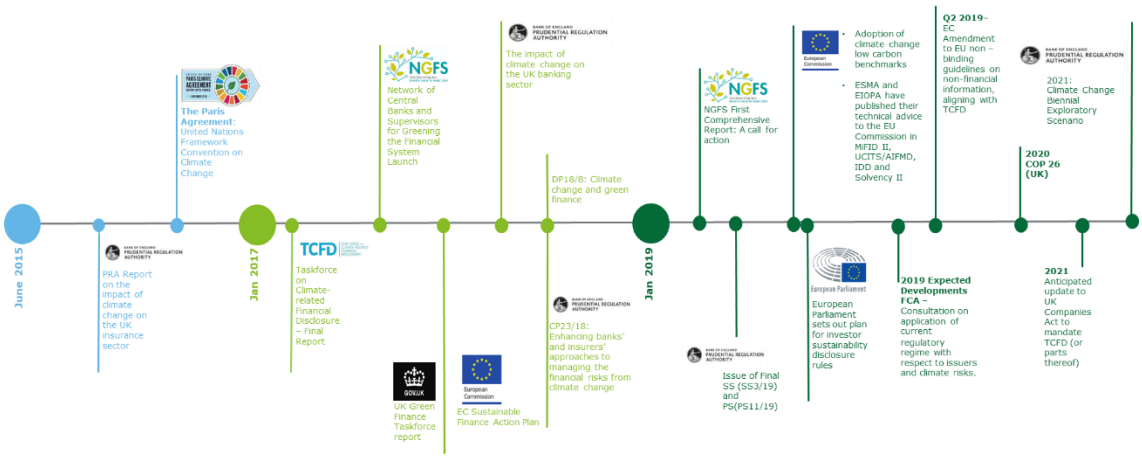

Figure 2 - The Governmental and Regulatory framework. Source: (Deloitte, 2020)

Most current frameworks are related to the Task Force on Climate-Related Financial Disclosures (TCFD), which has released a set of recommendations in 2017 with an

objective to develop voluntary and trustworthy climate-change financial risk disclosures.

Banks are driven not only by risks and opportunities to address climate change, but also by pressures coming from stakeholders. However Colas, Khaykin and Pyanet have assessed in the article Climate Change: Managing a New Financial Risk (Colas, Khaykin and Pyanet, 2019) that banks and institutions should also look at climate change risk as a financial risk, and not only as a reputational risk as it has been approached so far. The strategy suggests including climate risk assessment into financial risk management frameworks thus treating the issue not only within Corporate Social Responsibility but also within crisis management areas.

Previously, the same was suggested by the Bank of England's Prudential Regulation Authority (PRA) in 2018 (Bank of England, 2018), where it was assessed that institutions should take into consideration current and future risks related to climate change identifying actions that can be currently applied to mitigate both risks. It evaluated that climate risks should be assessed within governance arrangements and incorporated to existing crisis management plans, using long-term risk assessments to develop strategy setting and a system to disclosure climate change risks as demonstrated (Figure 3).

Figure 3 - Key themes related to climate change. Source: (Deloitte, 2020)

Governance considers mainly the adequacy of resources and expertise to manage those risks. Risk Management measures short and long-term risks assessing material exposures to climate-related risks and it develops sustainable policies to cover those risks. Scenario Analysis is part of a strategic planning and it is used to assess the impact of climate change-related financial risks, addressing the various outcomes and impacts

on the solvency and liquidity rates. Disclosure considers an appropriated approach to transparently disclosure climate change financial risks.

2.5 Crisis Management

Crises can be very diverse in nature and scope, but they arise from events leading to unstable conditions involving individuals, businesses and economies thus generating uncertainty. An organizational crisis is, therefore, a high impact event that can threaten firm survival as it usually results from abrupt changes in performance or high public expectation (Schmidt, Boersma and Groenewegen, 2018).

These events do not unexpectedly surface but they typically go through a process which is sometimes ignored by business representatives (Veil, 2011). Examples include i) confrontation crises which occur when there is a disagreement between public expectation and business practices; ii) crises of management misconduct which arise when businesses act immorally; iii) crises of organizational misdeeds which happen when a business knows its actions are directly harmful to individuals and they do not create an adequate safeguard; iv) crises of skewed management values which occur when administration standards are focused only on short-term results for its stockholders and do not consider other social values; and iv) natural disaster related crises which are created by environmental phenomena resulting in threats to life, assets, and the environment itself.

For this study, crisis is defined as a significant threat to business and operations that may come with negative consequences if not addressed properly (PR, 2007). Companies and governments need to keep their crisis management systems operating smoothly to be prepared for an unforeseen crisis. The COVID-19 crisis has demonstrated the economic impact of a global health pandemic which had not been planned for (Smith and Fraser, 2020). It is still too early to accurately predict the outcomes of this crisis, however even if the virus is controlled relatively quickly it is inevitable that it will leave many businesses to deal with tough economic issues.

Crisis Management is the process that exists to evaluate and address threats and events which may result in massive losses to companies. It is normally divided into three primary stages: (i) what to do before the crisis; (ii) what to do during the crisis; and (iii) what to do after the crisis. This division allows a business to understand and identify warning signals before the crisis, the necessary actions during the crisis to

minimize the impact on the company, and finally the measures which should be implemented after the crisis to mitigate another one from occurring.

Similarly, Gonzalez-Herrero and Pratt (1995) state that crisis management includes three stages: i) diagnoses of a crisis; ii) planning; and iii) adjusting to changes. The first stage involves detecting early warning signals and prepare the company to face the same. Once a crisis is detected, the second stage involves immediately planning and action to avoid an emergency. Lastly, the company must adjust well to the new reality and be prepared for changes for effective functioning (Gonzalez-Herrero and Pratt, 1995).

This process should start from assessing strengths and weaknesses of a business project, as well as the environmental opportunities and threats, considering past crisis experiences as potential instruments for developing new strategies and adhering to the theory concerning management of crises. The Institute of Public Relations (PR) assesses that a crisis can create three related threats: i) public safety; ii) financial loss; and iii) reputation loss (PR, 2007). It is recommended that companies are prepared with strategic financial planning to manage crisis ahead of time. (Sherman and Harris, 2018).

For Sherman and Harris, the level of devastation of a crisis should be measured, and as higher it is the more it increases the need for a quick response. The necessity for timely action is also increased by the lack of information on what started the crisis, what are the future implications of this crisis and how a company should address it further. Another issue when addressing an organizational crisis is the tendency for businesses to deny that is crisis is about to happen, which delays any decisive action.

A crisis management plan refers to extensively and detailed plan which compiles the various actions a business' need to take during critical events or crisis. It is designed to assist managers to take quick and relevant actions, and to protect a company from inevitable threats. The management of crises is influenced by the impact of globalization and the need for innovation. The problem is even bigger as in the real-world, crises are often interconnected with multiple causes, making it harder for companies to create a successful crisis management plan.

Crisis management can be seen as a significant, usually vital, part of strategic management as it includes the creation and implementation of preventive actions to

prevent a potential crisis, dealing specially with loss and damage and restoring business performance. These plans should be incorporated into the overall business strategy and should be constantly assessed to identify any improvements to be applied (Vašíčková, 2020).

2.6 Sustainable Financing and Business

Sustainable Finance, also known as Green Finance, is a term used to describe the relationship between environment, finance and investment, while considering a strategic approach to resource-efficiency (OECD, 2017b). It is relevant to approaches taken by public and private agents such as banks, businesses, and governments in developing and supporting sustainable projects through financial instruments. It is often associated with Sustainable Finance; however, it is important to understand the difference between the terms.

Sustainable finance is used to address environmental, social, economic and governance problems. Environmental problems include the quality and functioning of water, air, soil and usually relate to human actions which are harmful to the environment. Social problems are often related to issues that influence people's rights, such as lack of universal health systems, social inequality, poor education, unemployment and so on. Economic problems are defined by investments that affect society, assessing that economic resources are finite and not enough to cover people's needs. Lastly, governance problems relate to how businesses address issues which can arise from corporate strategy to management of crisis (Fairhurst and Nam, 2020).

The focus of green economy is on utilizing the power of investments to either help the environment or to reduce the harm caused by society, managing risks facing the financial sector which can be classified as physical, transition and liability risks (CBI, 2017). Yet, it is not possible to analyse how effective green financing is in addressing climate change without looking at the four issues.

There are several ways to introduce green financing to a business, starting by reviewing the governing body directing financial policy. For example, a company effort to reduce its environmental impact should be financially quantified such that it is considered akin to an investment, it would however require a system to assess and measure the environment impact indicator.

Some companies have already implemented green initiatives to their daily operations. To illustrate, Henkel is the first company in Germany to pursue and to introduce innovative ways of financing (Henkel, 2018), known as green loans. Green loan is a type of loan available exclusively to finance or refinance new or existing green projects, where interest rates are linked to a company sustainability performance. Henkel's performance, for instance, is based on three independent ratings provided by leading agencies in the field i) Sustainalytics; ii) EcoVadis and iii) ISS-oekom.

As mentioned in Chapter One, investments integrating environmental policies had reached $30 trillion at the start of 2018. The popularity of green investments is becoming so large that governments and policy makers are working on strategies to support this growing trend. For this reason, this research proposes to assess in how green financing could help society to tackle climate change.

2.7 Change in Political Climate

Climate change seems to have become one of the most addressed topics since global temperatures have increase by 1.1 degrees Celsius when comparing to preindustrial levels. The change has mostly happened due to human activities (NASA, 2018), which can be reversed depending on how eager society is to develop and implement plans to help with the issue (IMF, 2020). Even though ESG investing has been addressed and utilized for more than ten years, news policies promise to accelerate the course of climate change mitigation (Deloitte, 2019b).

The EEA European Environment Agency tracks Policies and Measures (PaMs) that have been implemented, adopted, or planned by countries in Europe to reduce greenhouse gas emissions. It has identified that 227 PaMs had an implementation start date in 2019, the highest number since the 1990s (EEA, 2020c) (Figure 4). These data reveal that governments are now more than ever engaged and committed to address and treat the problem.

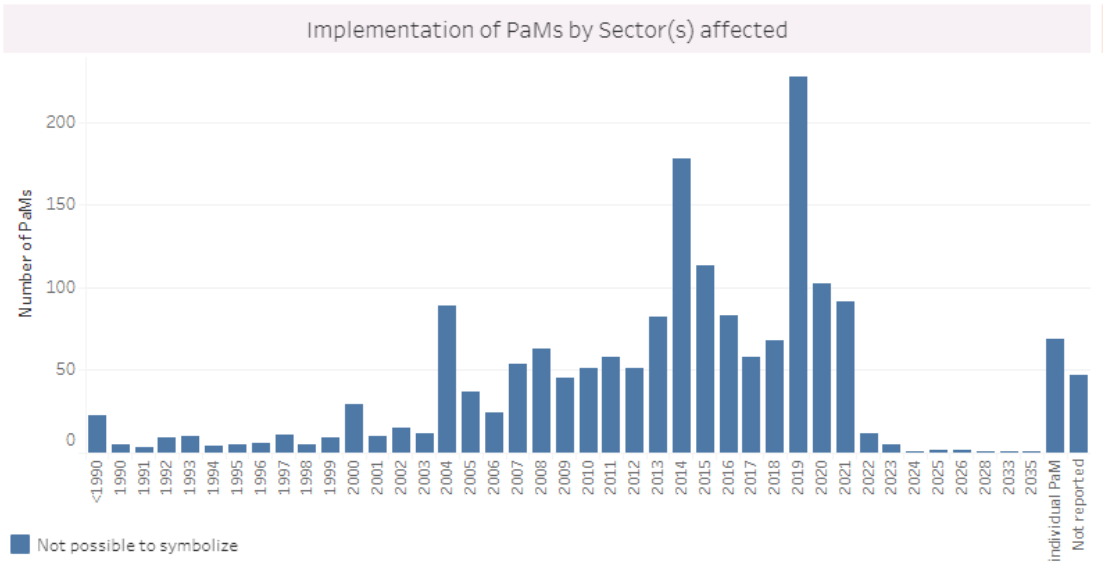

Figure 4 - National policies and measures on climate change mitigation in Europe. Source: (EEA, 2020c)

Belgium leads with 215 implemented PaMs by 2019, followed by France where 168 PaMs were reported for the same period (Figure 5).

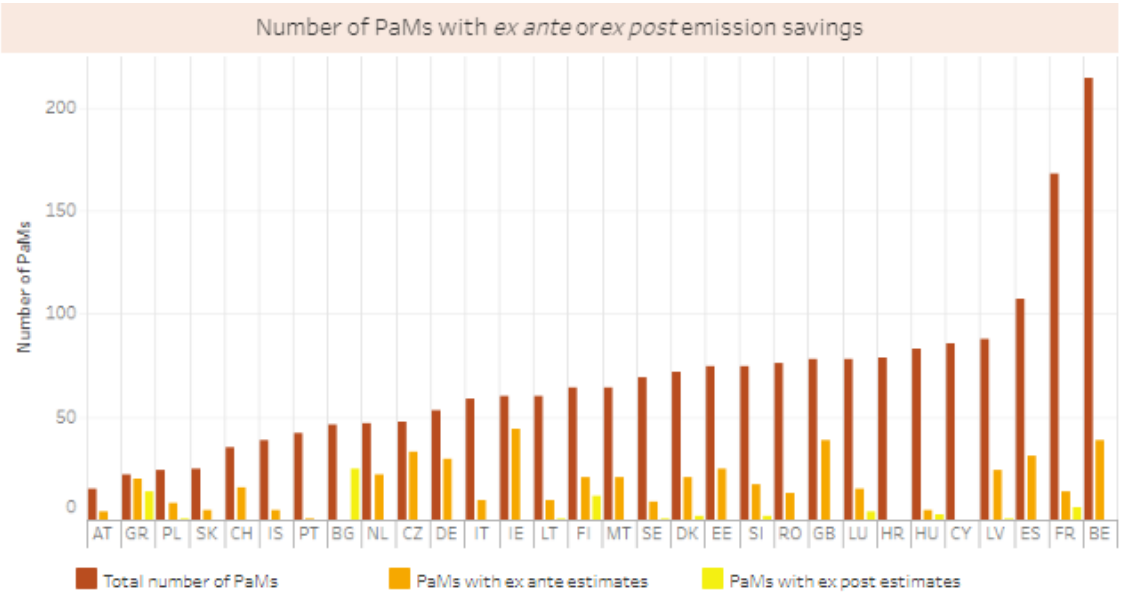

Figure 5 - National policies and measures on climate change mitigation in Europe. Number of PaMs with ex ante or ex post emission savings. Source: (EEA, 2020c)

However, according to the CCPI Climate Change Performance Index – Climate Policy, France scores 80.37 and is ranked on the 11th[a] position of the index (*France CCPI*, 2020), while Belgium scored 41.56 and is ranked on the 39th[a] position (*Belgium CCPI*, 2020).

CCPI highlights that France is in a better position considering all the contributors to climate change policy, and cites for example that the country has implemented a policy to reduce final energy consumption by 50% until 2050, which is one of the most ambitious targets worldwide.

On the other hand, out of the 61 countries evaluated, the United States (*United States CCPI*, 2020) and Australia (*Australia CCPI*, 2020) are placed in the bottom of the ranking on the 60th[a] and 61th[a] positions, respectively.

Australia faces a potentially serious problem as its government fails to clarify how the country will meet the 2030 emission reduction target, as well as failing to create long-term mitigation plans. The same source evaluates that the country has also withdrawn from the Green Climate Fund (GCF) which has contributed to a very low performance in the Climate Policy category by CCPI.

The USA does not have any targets or policies for reducing its GHG emissions even though it is one of the biggest polluters in the world. The problem is worsened by the current presidency administration having started the process to withdraw from the Paris Agreement (Eckhart, 2017).

The Paris Agreement is a Convention formed within the United Nations Framework Convention on Climate Change (UNFCCC) to assemble every nation into the common objective of addressing climate change. About 195 nations representatives signed the protocol at first in 2016, with some withdrawals in the following year when the Protocol was adapted (Eckhart, 2017).

In November 2019, the United States - one of the largest polluters in the world (Climate Action Tracker, 2019b) - communicated its decision to withdraw from the agreement. It will be effective in November 2020.

The protocol is the first ever international legally binding agreement and sets out a global framework to mitigate threatening climate change by keeping global warming temperature under 2°C, while aiming to fortify each country's ability to deal with the problem (European Commission, 2016).

Approximately 190 countries agreed to try to limited the increase in global average temperature to 1,5°C; to come together every 5 years to assess the results of the collective effort; to report what and how climate change initiatives are being implemented and to track progress through a transparency and accountability system; and to provide support to developing countries (Paris Agreement, 2016).

Many factors could lead to risk increasing in terms of investments, reducing investors' confidence. One of these factors is the lack of country initiatives related to green financing. The Paris Agreement is powerful in offering policies that provide a long-term direction for investors; yet, specific plans and strategies have to be put in place to help countries representatives, companies, investors and stakeholders to mobilize green investment (GFSG, 2016).

2.8 Conceptual Framework

Climate change, although it is a natural incident, is mostly related to human actions. As assessed within the literature review section, climate change will require substantial structural changes to the world economy, which will consequently impact operations financial disclosures across every business. The issue can only be tackled by businesses and policy makers if properly and effectively addressed, and the success of these responses is contingent on various factors such as the willingness to accept that climate poses a potential risk to the economy, and the promptness to accept and to develop strategies to reduce the vulnerability.

Historically, financial institutions have addressed climate change within Corporate Social Responsibility (CSR), however the approach is no longer sufficient. Assessed in the Risk to Financial Stability section, climate change has now become a financial risk and need to be considered within a risk management structure (Colas, Khaykin and Pyanet, 2019).

The following conceptual framework (Figure 6) represents crisis management as the centre of an effective climate change mitigation and adaption plan. Still considering climate change as a CSR as it offers a direct impact on stakeholders, for the purpose of this research climate change is mostly assessed as a financial risk.

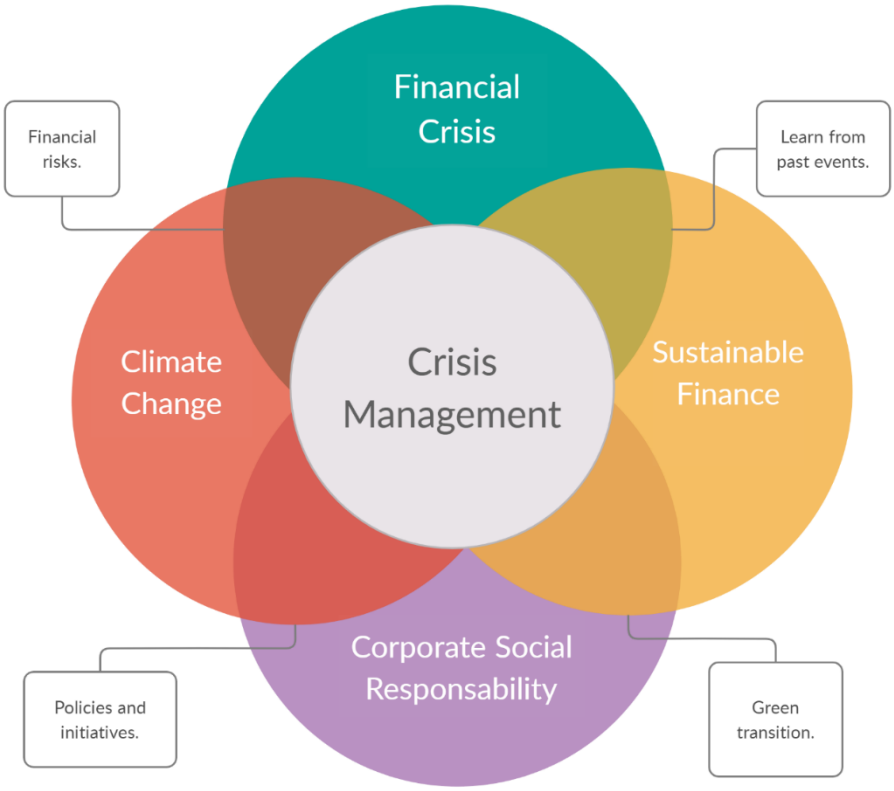

Figure 6 - Conceptual Framework

By analysing the financial crisis of 2008, the market failure is associated with excessive risk taking, followed by a major financial shock and loss of confidence (Helleiner, 2011). Climate has the potential of causing a major failure due to collapse in asset values caused by physical risks. Insurance companies are mostly likely to suffer the impacts of physical risks due to compensation for losses, resulting in increasing liability risks (Saha and Viney, 2020).

If climate change does not initially cause a major failure within the insurance industry, it has the potential of trigging a failure within industries such as Agriculture, Transport and Energy, which would then cause a considerable impact in financial institutions (Deloitte, 2019a).

Sustainable finance is a way of financing the transition to a low emission economy thus assisting transition risks which companies may face. Businesses and investors are required to demonstrate environmental, social, and governance (ESG) concerns by developing climate change-related disclosures ad by transitioning to greener

investment portfolios, as well as governments and policy makers are required to assist with information, incentives, policies, and frameworks to the transition.

The top of the framework consists in assessing the financial crisis of 2008, to understand what caused the systemic failure and to learn from the lack of a proper risk assessment at the time. This assessment assist businesses and governments on understanding that climate change can pose a serious financial risk to the economy if not properly addressed as it is created direct physical, transition, and liability risks.

The bottom part of the framework focus on relating CSR policies and procedures with climate, where the concern should be addressed throughout mission, vision, values, investments, and annual reports by developing a climate change-related risks disclosure. Not only being a responsibility to every business, large or small, but also every government, making of sustainable finance a way of reducing emissions and driving the world to a greener economy.

2.9 Conclusion

This chapter has aimed to develop a broader understanding of crisis management related to climate change through a review of literature.

It is clear that climate change has become one of the most addressed topics within businesses, governments, and investors in recent years, which has resulted in climate-related policies and regulations being further developed in 2019. Although CSR has been the centre of climate issues, it is slowly being replaced by a broader yet deeper crisis management assessment of climate change as a financial risk.

When reviewing literature about climate change as a risk to the economy, many researches have been found. Yet, due to its long-term characteristic, it is still not clear what is the financial impact economies are going to face. Sustainable finance, on the other hand, have been assessed to be an effective method of assisting businesses in transitioning to a greener economy. Furthermore, stakeholder opinion has been reviewed to be essential if companies seek to increase profitability.

Climate change poses physical, transition and liability risks to economies and offers potential negative impact to certain industries, especially financial institutions. It no longer represents a threat to future generations as some risks require immediate

action, therefore risk management must be considered as basis for climate-related policies and regulations.

3 Methodology and Research Design

3.1 Overview

This research primarily aims to understand how sustainable finance may help to fight climate change, as well as to evaluate why climate change could spark the next financial crisis if not properly addressed through crisis management and corporate governance. As some believe that climate change does not play a critical role in society, the input might be subjective to an individual's perception and therefore, an interpretivism philosophy is suitable for this project, enabling the author to deal with different perspectives and understanding of a subject.

3.2 Research Philosophy and Approach

Saunders, Lewis, and Thornhill (2009) explain the different layers of a research where research philosophies and approaches should be considered at first, followed by the definition of strategies and choices to then begin data collection and analysis. There are four main strands of research philosophy which are positivism, realism, interpretivism and pragmatism (Figure 7).

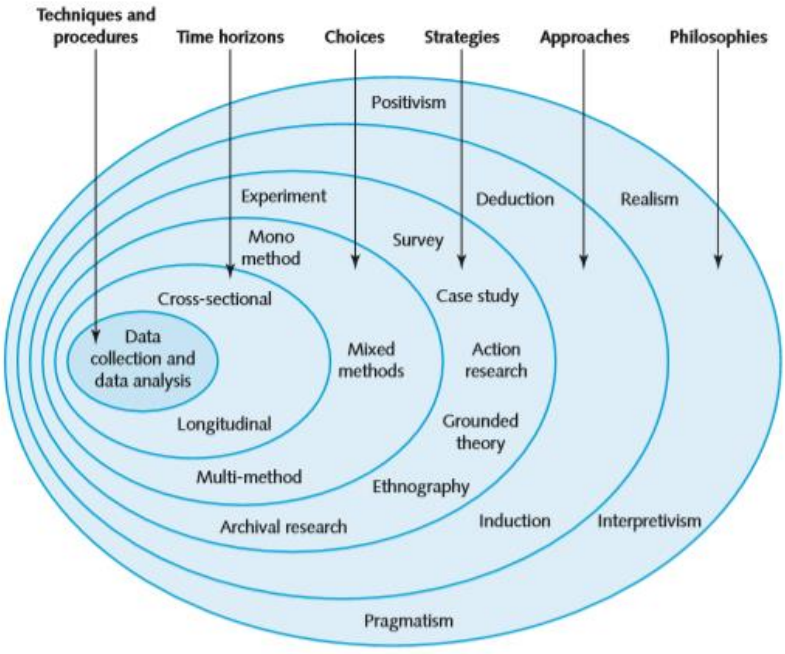

Figure 7 - The research onion. Source: (Saunders, Lewis and Thornhill, 2009)

Research philosophy is described by a sum of believes and assumptions on the way data should be analysed and deals with the source, nature, and development of knowledge. It is of extensive importance to be mindful and understand our philosophical position as it can influence the conductivity of a research.

This research is supported by examination and interpretation; therefore, a qualitative research is appropriate for this study as the author aimed to understand the possibility of an outcome and how to mitigate it from happening. However, some quantitative analysis is also applied. Saunders et al. also observe that some believe that the interpretivism perspective is appropriated for researches in field of business management especially when organizatoional behaviour is analysed as those situations can be very unique.

According to Walsham (2006), an interpretive philosophy does not result in a correct or incorrect understanding. Instead, a subject should be assessed considering how motivating and interesting it is for the researcher and those involved. It does not seek to generate new theory, but to evaluate and fractionate interpretative theories.

There are two main ways to gather information for a research, primary and secondary collection of data. The Oxford dictionary describes secondary research as data that have been collected and formatted, which is usually used in analysis (Oxford Dictionary, 2020). Primary research, in contrast, is collected originally by the person conducting the research.

The study aims to explore public climate change perception and how it affects corporate social responsibility trends and well as policies and initiatives created by governments. Using a survey as channel to collect primary data in climate change awareness, an inductive approach aimed to evaluate patterns and relationships to reach a conclusion. It is an exploratory research study as it intends to explore a problem, thus the author does not have as an objective to provide conclusive results, but to have a better understanding of how climate change affects the economy and what can be done to reduce that impact.

To analyse trends within the economy related to natural disasters and change in climate the author has chosen to use secondary data. Through a case of study, the author analyses official publications from banks and insurance companies such as

annual reports and climate change plans, as well governments' publications on climate change policies and initiatives and other financial indicators.

3.3 Research Strategy

The research design is created to help the author plan how the collection of data will be done and therefore achieve the best result. Considering that the area of research has not been thoroughly explored, and this project aims to evaluate different insights in relation to climate change, the author will utilize both an exploratory and a descriptive approach.

As previously mentioned in Chapter 1, this project aims to understand both, if, and why some businesses have not implemented sustainable initiatives to their daily operations and to assess the opportunity that sustainable financing has for companies which in turn, incorporate practices that can bring benefits to the environment. When a conclusion is reached, the researcher has as an objective to propose recommendations to businesses for mitigating climate change using sustainable finance.

This research strategy will be guided by a case study and a survey. The responses from the survey aim to help the author to understand what perception people have of climate change. The case study is focused on analysing France and Australia as representatives of countries that are succeeding to address climate change and countries that have struggled, respectively.

Even though companies have started introducing the concept of green finance to their strategies recently, the measurement of risks related to change in climate is still an issue due its long-term nature. As a result, those risks are not considered as important as other short-term risks that businesses can easily assess. There is an in-depth study in the field of climate change and how businesses' practices affect the environment; however, it is urgent to analyse what impact this long-term issue is already causing to the economy and what outcomes can be expected in the future.

3.4 Collection of Data

As mentioned in Section 3.2, this project utilizes qualitative research methods to assess external information. Quantitative method is utilized to assess primary data.

Firstly, an online survey was disseminated to reach the general public to understand their climate change awareness and perception. The survey focuses on understanding if there is a tendency to support a company which has a strong corporate social responsibility in relation to climate change, and to evaluate how aware about climate change initiatives the public is, and what is the perception about climate change impacting the economy. The survey was created to assist the author in the exploratory aspect of the project by giving the public the opportunity to express their view on the matter, to then understand if this perception have any effect on how companies and governments have been acting.

Through a case study, the author assesses companies' annual reports and climate change plans to evaluate financial losses linked to natural disasters in France and Australia. Also, by analysing mission and vision statements the author seeks to understand if climate change is somehow being addressed by those companies. Government reports on climate change and economic impacts of natural disasters are also assessed to understand which role governments have been playing in addressing the issue, as well as indicators of the financial position of the countries.

3.4.1 *Sources*

As evaluated earlier in the conceptual framework section, to analyse how climate change poses a serious risk to the economy, crisis management plays an important role in the process. The main sources utilized for this study were public information such as annual reports and climate change mitigation plans.

Focusing mainly on corporate social responsibility, the survey was created with the objective of later associating stakeholders' perception of current CSR practices with inferences derived from the case study. In designing the survey, mission, vision, and values statements, as well as CSR reports were also assessed as a way to understand where the companies stand when addressing Corporate Social Responsibilities and if climate change was part of their strategies.

Firstly, this research has digitally delivered a questionnaire of 15 questions in order to assess climate change awareness. It was released for a period of ten days and it reached

a total survey population of 100. To guarantee that the results represent the reality, the survey was released to different groups from different ages and backgrounds.

With regard to the case study, information on how the largest banks and insurance companies in Australia and France were addressing risks related to climate change was accessed online. The author searched for public reports on climate change-related financial disclosures. Regards to government policies and initiatives, online independent reports were assessed aiming to evaluate if there were sustainable finance incentives in place, as well as to understand what role the governments were playing in addressing climate change.

3.4.2 *Access and Ethical Issues*

As explained earlier, the author uses a survey and a case study as methods for data collection.

The survey was carried out online and no personal information was collected from participants.

All the information collected will only have relevance of findings for the research and should not cause any discomfort or harm to any participant.

3.5 Approach to Data Analysis

Different approaches to data analysis can be found, and its selection can be influenced by numerous factors such as the purpose of the research and what are the resources available to better answer the research question. Primary and secondary data has been used for the purpose of this research.

A survey is the collection of primary data from a sample of individuals considering their answers to pre-set questions, this method allows both quantitative and/or qualitative analysis (Ponto, 2015).

The survey did not aim to direct answer the research question, but to be used as a complement to the broader research of understanding how stakeholders play a vital role in charging companies and governments for climate policies.

Secondly, to explore the main research question the author has chosen to work with a case study. Case studies are vastly used to assess how individuals influences people by constructing processes and practices, and have become one of the most common

methods to perform qualitative inquiries (Kohlbacher, 2006). Qualitative analysis is the chosen approach to the case study data analysis, where an exploratory and inductive approach to collect secondary data is used in order to answer the research question.

Kohlbacher has also assessed that exploratory case studies are usually preferred when answering "why" and "how" research questions, when the researchers have not enough control over the events examined and when the analysis focus on a recent event. Furthermore, it also has found that a case study research is a detailed investigation often of data collected over a period of time, aiming to assist the studied theoretical issue. While quantitative data can be used with case studies, qualitative data is usually more noticeable.

Case studies are associated with the interpretivism paradigm, which considers subjective experiences to reach a conclusion meaning that the researcher views have a vital role on the study results (Starman, 2013). Starman has evaluated that sometimes this research approach is criticized due to the subjection of case selection, where the researcher can be bias.

To avoid that, this research has selected two different countries to be assessed in the case study, France and Australia, based simply in review of literature. Earlier in that chapter, the researcher has found that France was the European country with the higher number of climate policies implemented in 2019, while Australia had been assessed in the same year as the worst country for climate change policies out of a 54 countries assessment list.

The researcher has also assessed in the literature review chapter that financial institutions such as banks and insurance companies will be the most affected businesses in the future by physical, transition and liability risks. For that reason, banks and insurance companies were chosen to be assessed in the case study. To not have any bias on the chosen companies, the research has considered for the purpose of the study the two largest listed companies in both industries and countries.

The frequencies of the responses of each one of the items in the survey were measured. Assessed individually, the findings were measured and graphically represented in Chapter 4. Various themes which emerged from the cases studies were assessed,

represented, and discussed in Chapter 5. The survey responses were then further discussed in the context of the insight derived from the case study.

3.6 Conclusion

In this chapter, the author has assessed different research philosophies and approaches. Not seeking to generate new theory, the study does not result on a correct or incorrect result. An interpretive philosophy has been chosen, and therefore a qualitative research is appropriated.

Even though there are extensive studies relating climate change and business, this research aims to reach an understanding of the financial outcome related to the issue by utilizing primary and secondary, thus a survey and a case study were utilized to create an exploratory research. An inductive approach was taken to evaluate patterns and relationships.

Public sources were used for the purpose of the case study, such as annual reports, climate change plans, corporate social responsibility reports, independent parties report on governments' strategies and other indicators as such GDP, Gross National Income, Unemployment Rate, Customer and Business Confidence Index, and Government Trust Index. All the information assessed was based on review of literature to avoid any bias.

The survey questionnaire was conducted online, and no personal information was collected. To preserve the relevance of the findings, the survey was delivered to people from different ages and backgrounds.

All the information collected will only have relevance of findings for the present research.

4 Survey - Presentation and Discussion of the Findings

4.1 Overview

Climate change poses serious risk to society and have been agenda all over the world. Chapter 2 argues that stakeholders can massively impact on future environmental policies. Considering this fact, understanding public's perception about this growing concern is vital before analysing companies and governments behaviour. This chapter presents the findings derived from the surveys of stakeholders' perceptions on climate change. The findings are then interpreted and discussed before analysing the findings of the case studies in Chapter 5.

4.2 Findings

This chapter sets out the results of the survey in public climate change awareness and perception. Initially assessing demographic information such as country of location, age, level of education and employment background, this study then analysis specific data to draw a conclusion.

An electronic method of data collection was utilized for this study, and the research populations comprised 100 research. The survey questionnaire can be found within Appendix A of this study[2].

4.2.1 *Demographic statistics*

This section of the chapter sets out demographic statistics resulted from the survey.

LOCATION

The research aimed to attract research participants around the globe to have an understanding if climate change perception changes depending on the country of location. As observed (Figure 8), 51% of the participants were in Europe, followed by 14% in Africa, 13% in South America, 10% in Australia & Oceania and the remain of 5% in North America.

[2] Survey response data is available from the author upon request.

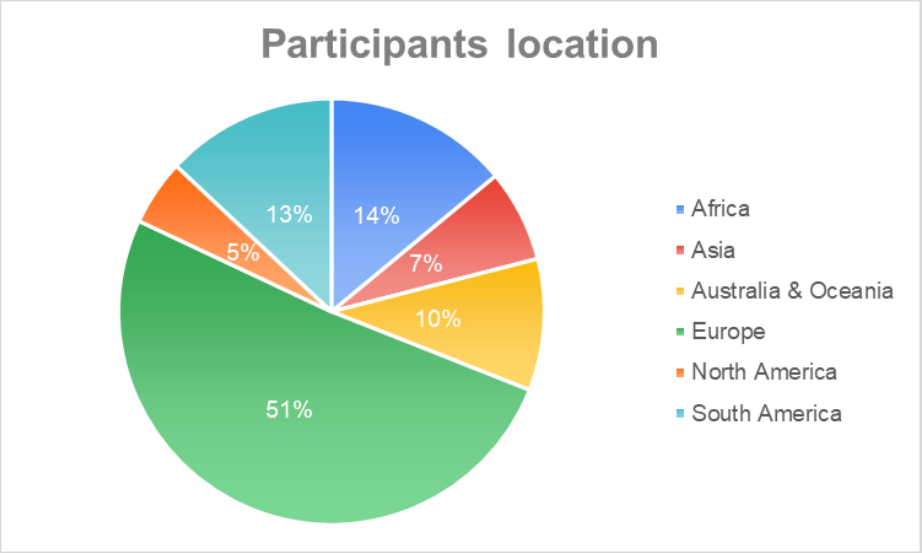

Figure 8 – Participants location chart

It is possible to see that most participants are somewhat aware or aware of climate change policies and initiatives. However, 40% of the participants located in North America are not so aware of policies implemented within their own countries (Figure 9).

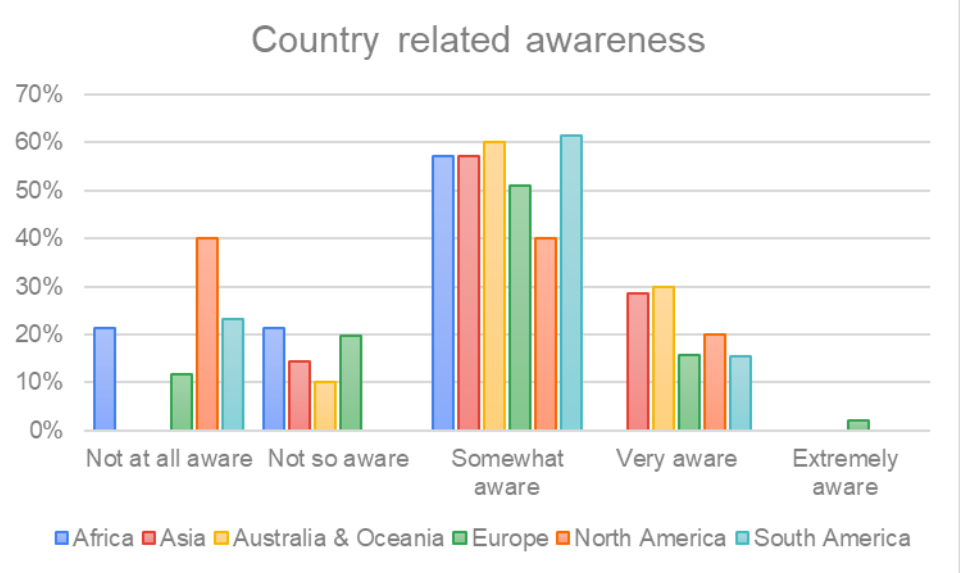

Figure 9 – Country related awareness graph

AGE

The research aimed to attract research participants from different age classes to assess if it has any influence in their perception regarding the topic. As represented (Figure 10), 53% of the participants were between 20 and 29 years old, 34% were between 30 and 39. 6% were above 60 years old, and the remaining were between 40 and 59.

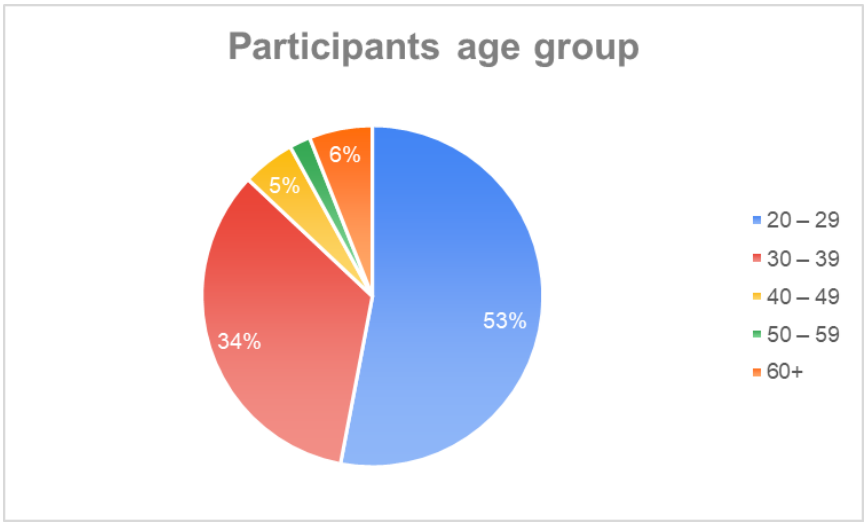

Figure 10 –Participants age group chart

When the participants were asked how informed they believed to be on climate change, the majority indicated that they are somewhat informed (Figure 11). Age does not appear to be a factor that influences on people's perception of the topic.

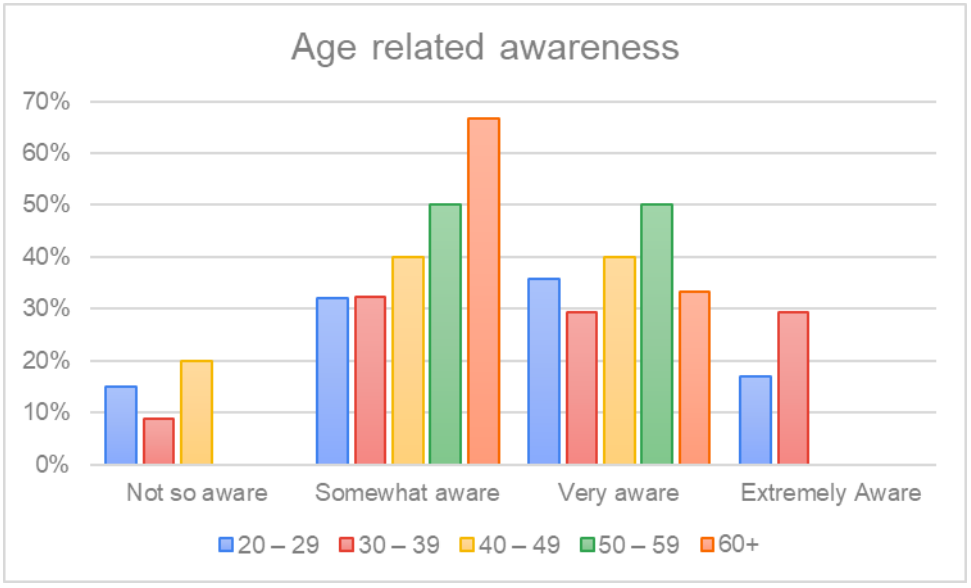

Figure 11- Age related awareness graph

However, only participants between 20 and 39 believe to be extremely aware about climate change issues.

EDUCATION

The study also assessed if the level of education compromised to any extent the participants view of the topic. 50% of the participants have completed a bachelor's degree, 32% have completed a master's degree, 16% have completed high school and the remaining have completed a Ph.D. or higher level of education (Figure 12).

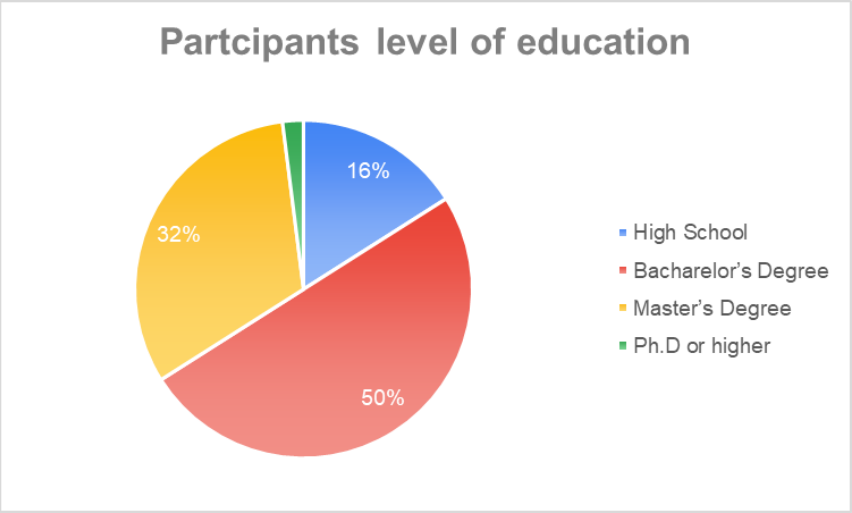

Figure 12 – Participants level of education chart

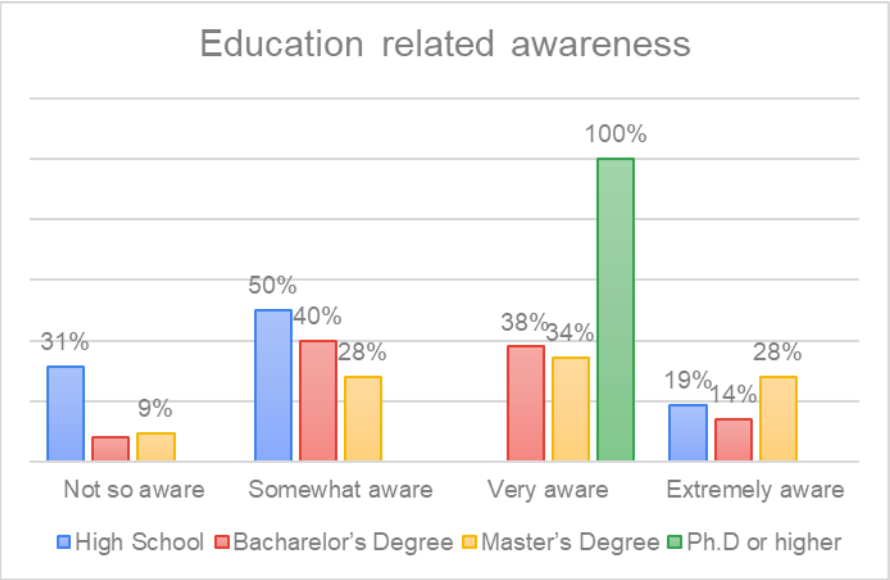

Figure 13 - Education related awareness graph

It is possible to conclude from the survey results that education does play an important role in climate change perception. As demonstrated (Figure 13), 31% of the participants who have completed up to high school are not so aware of climate change issues, while participants who have completed higher level of education are mostly somewhat aware or aware.

WORK SECTOR

To complete the demographic section, this study aimed to evaluate if work background has any influence on public climate change perception. 52% of the participants work within the private sector, 12% within public institutions. 17% are not currently employed, and the remaining 19% work within NGO, academia, or any other sector (Figure 14).

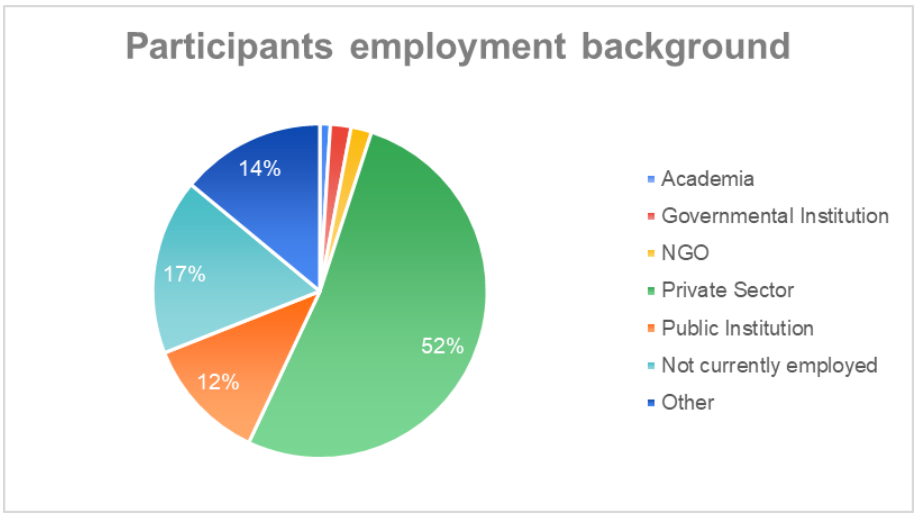

Figure 14- Participants employment sector background chart

The results (Figure 15) show that the sectors of employment in which the participants are does not impact on the level of awareness of climate change issues.

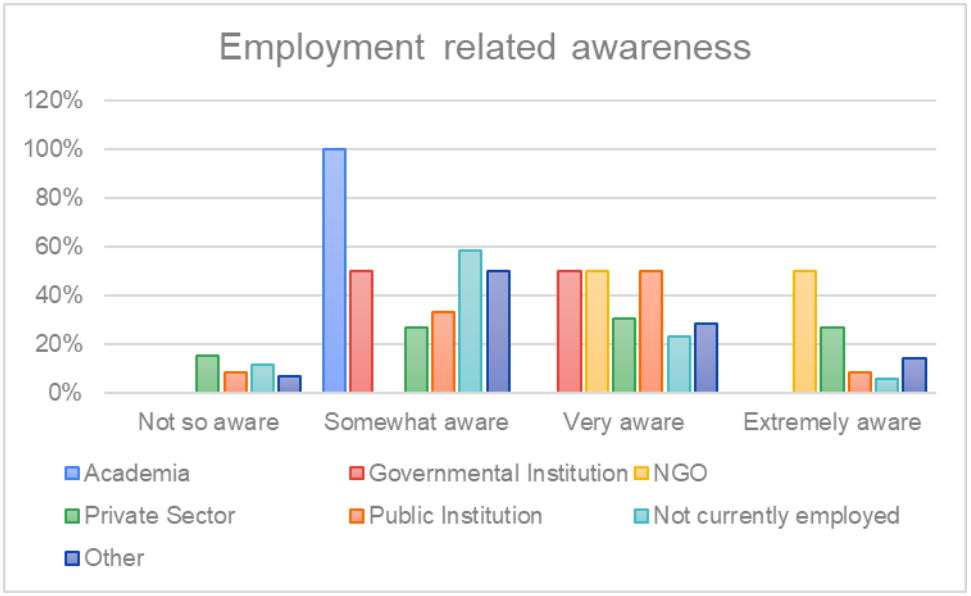

Figure 15- Employment related awareness graph

4.2.2 *Climate change awareness analysis and stakeholder perception*

This section of the chapter assesses climate change awareness considering total participants, not taking into consideration any background.

In question 5 of the survey (see Appendix A for reference), participants were asked to in a scale from 1 to 10, how informed they believed to be on climate change, considering that 1 meant not at all aware, 5 meant somewhat aware, and 10 meant extremely aware. Analysing the numbers (Figure 16), 12% of the participants believe to be not so aware of climate change, while 35% believe to be somewhat aware. Followed by 34% considering to be very aware, and 19% very aware.

This means that in a survey population of 100, 88% believe to be somehow informed about the topic.

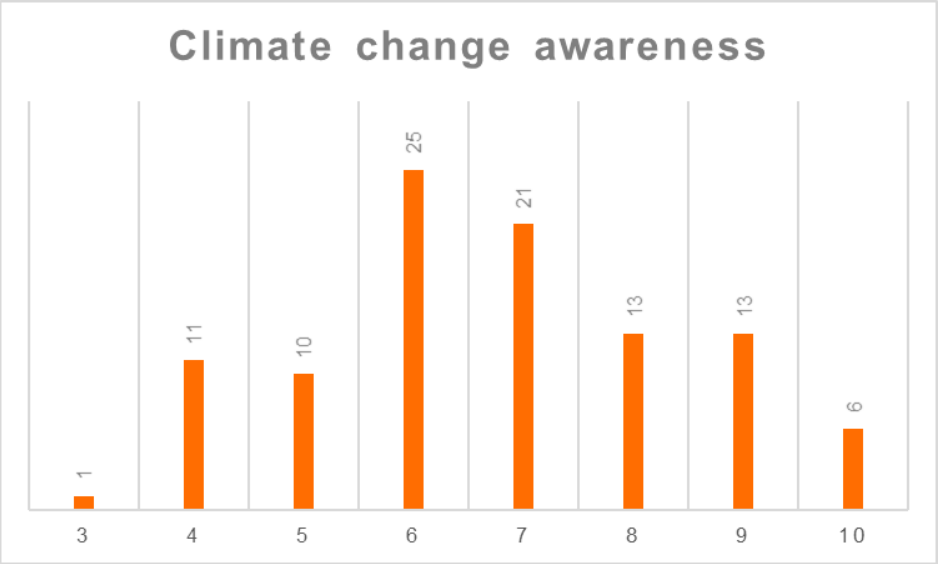

Figure 16- Climate change awareness graph

Even though some participants seem not to be so aware about climate change, when asked if environment was considered in their daily life, only 1% have answered no. 99% of the participants consider the environment to some extension when making decisions. Waste recycling is largest category with 79%, followed by reducing consumption of water 64% and energy 63%.

When participants were asked if they would stop consuming a product or a service because it causes any sort of damage to the environment (Figure 17). 67% answered that probably would, 23% that definitely would. Furthermore, when asked how likely

they were to support companies that demonstrate concerns about climate change, only 9% have answered highly unlikely or unlikely (Figure 18).

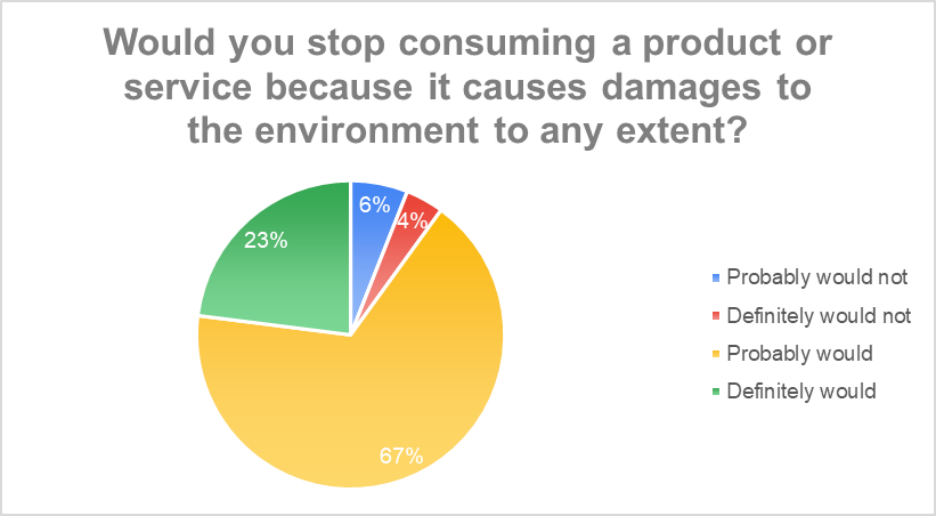

Figure 17 - Products and services consumption graph

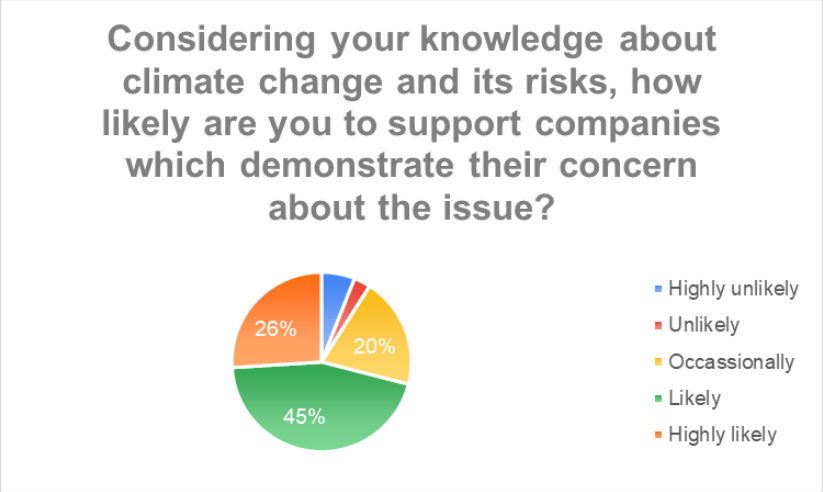

Figure 18- Stakeholder perception and preference graph: how likely are you to support companies?

Even though some participants seem to not have much information about the topic, most are keen to consider the environment in their decisions in what consume and where purchase, and in collaborating reducing their impact in climate change.

4.2.3 *Economic outcome and Accountability*

The purpose of this section of the chapter is to analyse any possible financial loss participants might have suffered from natural disasters, how climate change is perceived to affect the economy and who is accountable for addressing the issue.

The participants were asked in question 9 (located in Appendix A) of the survey if they have ever suffered any physical losses due to natural disasters, 72% answered that they have never. Of the remain 28%, 38% have had physical losses due to floods, followed by 16% to droughts and 16% to cyclones (Figure 19).

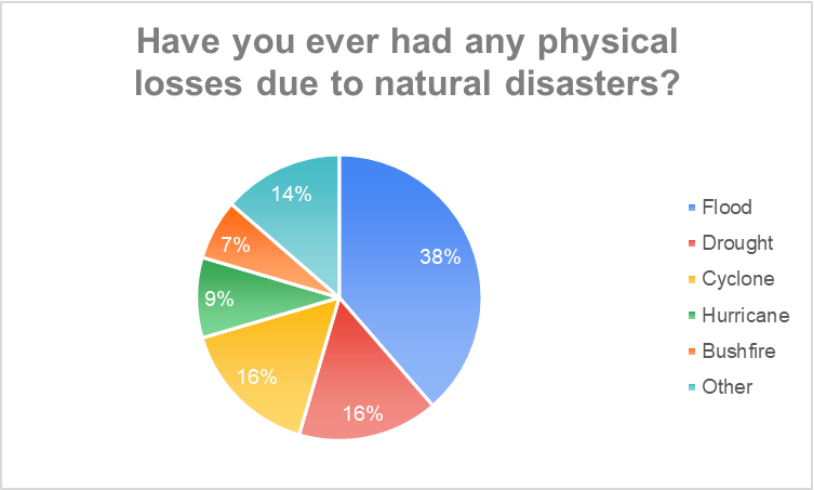

Figure 19- Physical losses assessment graph

As pictured (Figure 20), when asked how much climate change can threaten the economy, 62% believe climate change poses some extent of a threat or a considerable threat to the economy, 33% think it represents a major threat.

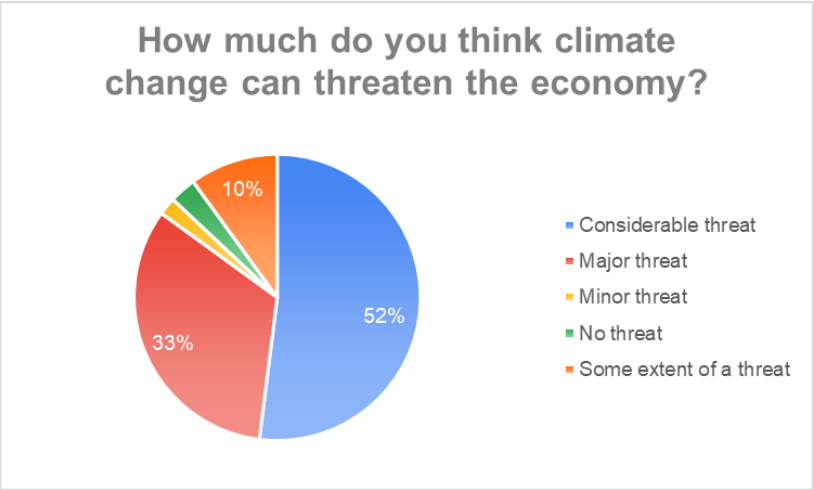

Figure 20 – Climate change poses a threat to the economy graph

Even though most participants believe climate change is a risk for the economy, and 28% has suffered physical losses to natural disasters, of the total survey population, 43% are not aware of policies or initiatives created by companies and governments to mitigate climate change (Figure 21).

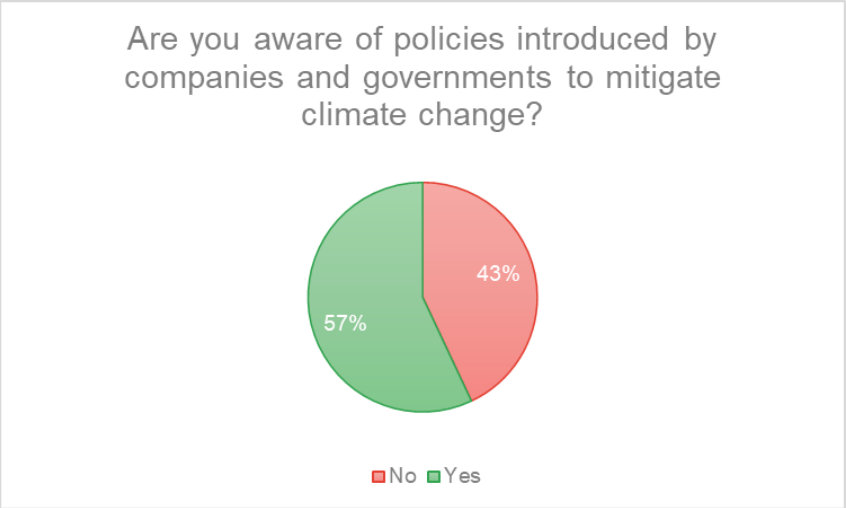

Figure 21 - Initiatives and policies awareness graph

In contrast, participants were asked to answer to the best of their knowledge if they believed that individuals, governments, businesses and industries, and environmental organization are creating initiatives to address climate change. The result was that many participants think that initiatives have been created to some extent (Table 1).

Answer	Individuals	Governments	Business and Industries	Environmental Organizations
Yes	18%	24%	21%	59%
No	29%	22%	23%	7%
To some extent	53%	54%	56%	34%

Table 1 - Initiatives and policies perception

The participants were then asked in a rank 1 to 4, what they believed to be the level of responsibility of individuals, businesses, governments, and environmental institutes to address climate change; 1 accounted for the least responsibility and 4 for the greatest. Interestingly, most participants believe that all the four stakeholders have greatest level of responsibility for the issue (Figure 22).

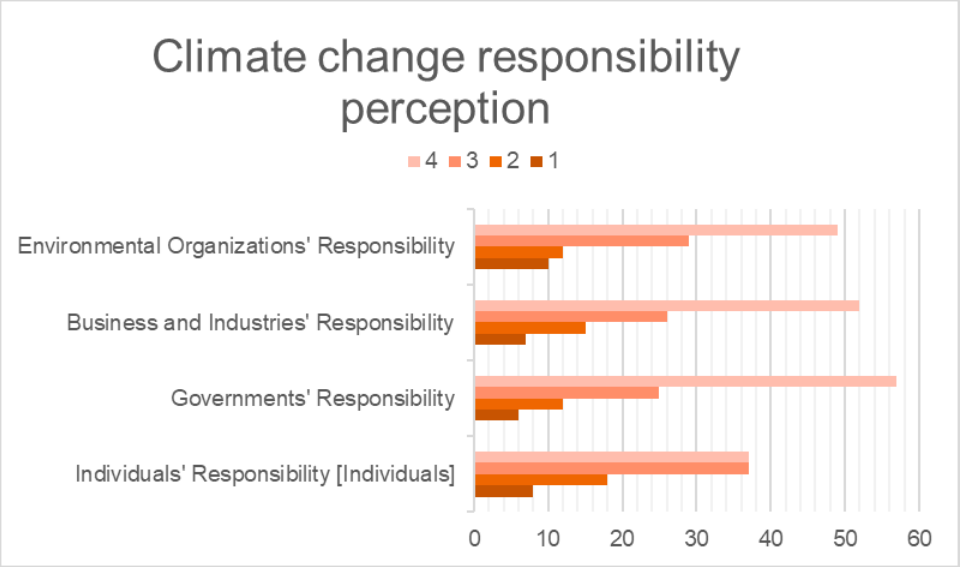

Figure 22 - Level of responsibility perception graph

57% believe that governments are the greatest responsible for climate change, followed by 52% business and industries and 49% environmental organizations. Individuals is the only category that have divided the public, 37% believe that individuals have the greatest level of responsibility, but another 37% believed that individuals had some responsibility grading it as 3.

4.3 Discussion

The way climate change is dealt with is usually related to public perception of its causes and consequences, having a direct impact on governments and businesses actions. As such, public perception and awareness are critically important when analysing how climate can possibly affect the economy.

The survey has shown that population world-wide considers climate change a serious problem, some were already harmed by this due to floods, droughts, cyclones, and wildfires. Even those who have never experienced any type of physical losses due to natural disasters agree that it represents a threat to society and to the world economy.

4.3.1 *Country of location and related awareness*

Even though researches have assessed that developing countries suffer more with change in climate (Mertz *et al.*, 2009), the country of location seemed to not impact climate change awareness. In overall, people all over the globe described themselves as somewhat aware of policies created in their countries as a result of climate change. However, it does stands out that 40% of the participants located in North America are not at all aware of climate change policies and initiatives, as the USA alone is one of the largest polluters in the world (Statista, 2020a).

A federal report found the United Stated of America to be under-pricing the "social cost of carbon – which describes economic damages from increases in carbon dioxide emission – showing the weakness of climate change regulations (Friedman, 2020). The administration have used two ways to decrease the number, by factoring damage in the country alone thuds not considering the rest of the world, and by using discount rate assuming that society would not spent money now to prevent the hazard to future generations.

Critics have underlined how the USA presidency have not been addressing climate change and have instead decided to withdraw from the Paris Agreement. Mexico is another country which has been identified to be vulnerable to the impacts of climate change, but its new administration has not yet provided or announced a short-term climate change action plan (Climate Action Tracker, 2019a). As previously mentioned, human perception can be influenced by social structures and politics, which explains the high percentage of participants considered not aware of climate change in North America.

Moving forward, a participant located in Japan has pointed out that in the country many people are aware of climate change, and most try as much as possible to reduce energy consumption. However, due to rise in temperature from July to September, heatstroke has become a massive issue. In recent years, the country has also faced natural disasters, resulting in significant economic damage.

Having an equivalent to just under 60% of the total world population (Statista, 2019), Asia is described as one of the most vulnerable regions to be hit by climate change. According to the Global Climate Risk Index, Thailand, Philippines, Vietnam and Myanmar are among the 10 countries around the world affected the most by change in climate in the past 20 years (IMF, 2018). Studies explain that the economic impact in some Asian countries could be devastating, losses could result in gross domestic product (GPD) decrease by 11% by 2100 (Raitzer *et al.*, 2015).

4.3.2 *Age, employment, and education*

Age and employment background did not impact on how the participants perceived the issue, however only the younger survey population – in their 20s and 30s - consider to be extremely aware of climate change. Education, on the contrary, appears to have an effect on climate change awareness and perception. 31% of participants who have completed high school as level maximum of education are not so aware of climate change policies and initiatives, contrasted to 8% of those who have completed a bacharelor's degree and 9% of those who have a master's degree.

Anderson (2012) suggests that since climate change is mostly worsened by human actions, society must identify those actions and change. Starting by learning how to change the way consumption is treated by utilizing renewable sources. Education can change behaviour as such lifestyles, social structures, and economies by showing people how to act in a responsible way and to make society accountable for addressing sustainability issues.

When participants were asked if any suggestion could be given to improve mitigation, education was cited nine times by different respondents. Some believe that climate change education should be provided in school, others that society should be re-educated to change the way environment is treated and, consequently, to set a better example for future generations. Furthermore, some participants believe that society in general is not aware of how their daily actions impact the environment, so to mitigate the problem awareness campaigns should be created.

A participant has brought an interesting discussion by commenting that governments, companies and people vary in the way they can fight climate change according to their degree of development, wealth, and education. Some participants who have completed maximum of high school and are located in Australia & Oceania have stated that climate change is a "hoax" and a "myth", explaining that governments have been destroying economies with climate change mitigation. It can be related to the level of education, but it is more likely that other background situations have influenced the way climate change is perceived by those participants, as they are isolated opinions when comparing to the whole.

4.3.3 *Climate-related policies and initiatives*

Pointed as the greatest responsible to address climate change, participants believe that governments are accountable for providing education. Even though 78% of the survey population believe governments have been creating initiatives to fight change in climate, literature and current surveys have shown that measurement, planning and access to information should be improved as well as regulations should be tightener for those who not comply.

That figure is contrasted by the 43% of the total survey population who have answered to not be aware of policies and initiatives introduced by companies and governments. So even though about 80% believe that they were created, nearly half of the participants are not aware of their existence. These contrasting figures show that population is keen to believe that the issue is being addressed, but not keen to seek information and accountability.

Furthermore, respondents were asked if environment is considered in their daily actions, only 1% have said that it is not. 79% of the participants do waste recycling, just under 65% have reduced water and energy consumption, 56% purchases environmentally friendly products, and 34% use alternative way of transport. Also, 91% of the participants would support companies which have demonstrated concern about climate change, and 90% would stop consuming a product or a service that cause damages to the environment.

Some have given suggestions to improve climate change mitigation by changing our daily habits; examples are avoiding car and using bicycle, having a water tax introduced so people would use it more consciously, giving incentives for those with hybrid cars as those with electric cars, making more renewable energy and disposable degradable

products, and ending plastic bags in supermarkets. A respondent has brough up that high prices charged for products and services provided by companies with environmental responsibility makes the acquisition by most of the population that belong to less favourable classes unfeasible.

The concern is not only if society will ever be able to afford eco-friendly products, but also what will be the economic outcome of natural disasters and change in temperature all over the world. 52% of the participants believe that climate change represents a considerable threat to the economy, while 33% consider it a major threat.

Even though individuals are keen to be re-educated about the way environment should be treated and to support environmentally responsible companies, they should also seek responsibility and accountability from every business and government, as much as from other individuals. Green products and services have to become accessible in order to be vastly consumed, but for that, companies need to be able to invest in green initiatives and governments to create policies to measures to assist those businesses. Climate change does represent a serious risk to the economy, and if the issue is not properly addressed countries could see a financial crisis in the near future.

4.4 Conclusion

Initially published by Freeman in 1984, the stakeholder theory has been basis for management research for decades. Stakeholder by “any group individual “any group or individual who can affect or is affected by the achievement of the organization's objectives” (Freeman, 1984 p. 46).

Assessed in the literature review chapter, Corporate Social Responsibility (CSR) refers to business practices that benefits society, becoming an essential component to a business strategy due to the ever-changing environment in which companies operate. The business sector is identified at the core of CSR; however, other stakeholders such as governments and society also have an important role to play on the debate. For that reason, this chapter has assessed public climate change awareness and perception.

At the individual level, perception can be influenced by personal attitude towards climate change, however it can also be subject to wider socio-cultural and political factors. Although the way these factors interconnect is complex, public perception has shown to influence on public and private sphere actions by recognizing the criticality

of climate change, showing concern about its impact, taking responsibility to address the issue, and charging accountability.

The survey population has not only demonstrated to be keen in supporting companies that shows a concern for the environment, but also to be willing in not consuming products and services that present harm to the environment. Further, most of the participants believe that governments and companies are the most accountable to address climate change. How this has influenced businesses and policy makers is assessed in the next chapter of this study.

5 Case Study - Presentation and Discussion of the Findings

5.1 Overview

As analysed in the previous chapter, society believes that climate change poses a serious risk to the economy. However, instead of only assessing public opinion, this research also assesses business and policy makers to understand how the issue is being conducted and what are the economic outcomes of this actions. France and Australia are evaluated in this case study.

France - also known as French Republic (République Française) - is the second largest economy in Europe, just behind Germany, and the 7th largest in the world. The country has a population of approximately 67.4 million people, a GPD per capita of $38,500 and a unemployment rate of 9.4% (Forbes, 2020b). According to Statista, over the next four years its economy is expected to grow gradually, however it might change due to the covid-19 outbreak (Statista, 2020c). The country has the second largest power generation capacity in Europe, and it is the second country to utilize less carbon on its electricity generation mix followed by Sweden (Deloitte, 2015).

Australia - formal name Commonwealth of Australia – is the sixth largest country by land mass (*BBC News*, 2018), and the has the third highest GDP per capital in Asia-Pacific region (Statista, 2020b). It counts with a population of about 23.3 million people, a GDP per capita of $53,800, and has an unemployment rate of 5.6% (Forbes, 2020a). Australia assumed the 11thª position of the 20 countries with the largest GDP per capita in 2019, just behind countries as United States of America, Singapore, and Denmark (Statista, 2020d).

Earlier in the literature chapter, it was concluded that climate change comes with long-term risks which are usually not evaluated for not presenting urgent concerns to businesses and policy makers. However, 2019 marked the start of a different approach having more initiatives registered than in any other year in our history.

5.2 Findings

In this chapter only secondary data is collected in order to later analyse if climate change poses a potential risk to the economy. Secondary data, as explained in the Methodology chapter, refers to existent data available for researchers.

Financial Services and Insurance business are considered to offer the highest material risks to the economy when assessing financial crisis. The case study focuses on mainly assessing annual reports, climate change mitigation plans, and corporate governance responsibility documents for the industries mentioned, as well as other vital indicators when assessing the economy.

5.2.1 *Indicators*

In this section the study assesses financial and other indicators to further analyse the economic situation in Australia and France. All the secondary data here contained was collected from the World Bank Database and the OECD database.

As demonstrated (Figure 23), The World Bank have assessed that Australia had a Gross Domestic Product (GDP) of US$ 54,907 per capita in 2019. France had a GDP of US$ 49,435.2 per capita in the same period.

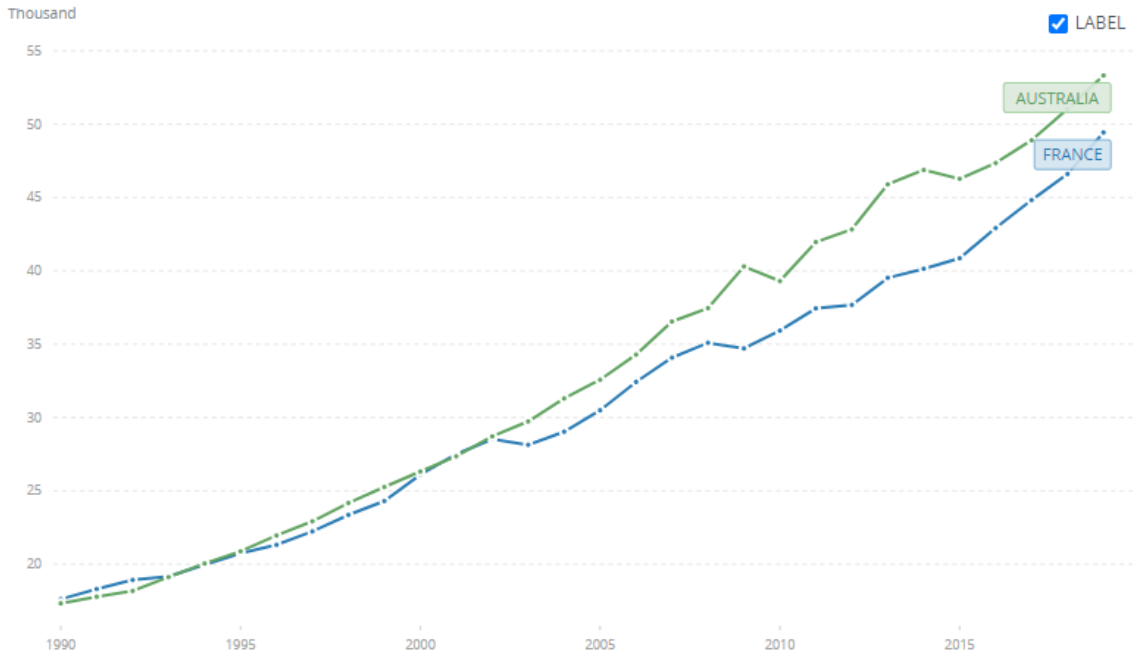

Figure 23 - Australia GDP 2019. Source: (World Bank, 2020)

The Organisation for Economic Co-operation and Development (OECD) has identified a Gross National Income in Australia of US$ 51,925 per capita in 2018, and a Gross National Income in France of US$ 47,290 in the same year (Figure 24). 2018 was the last year available.

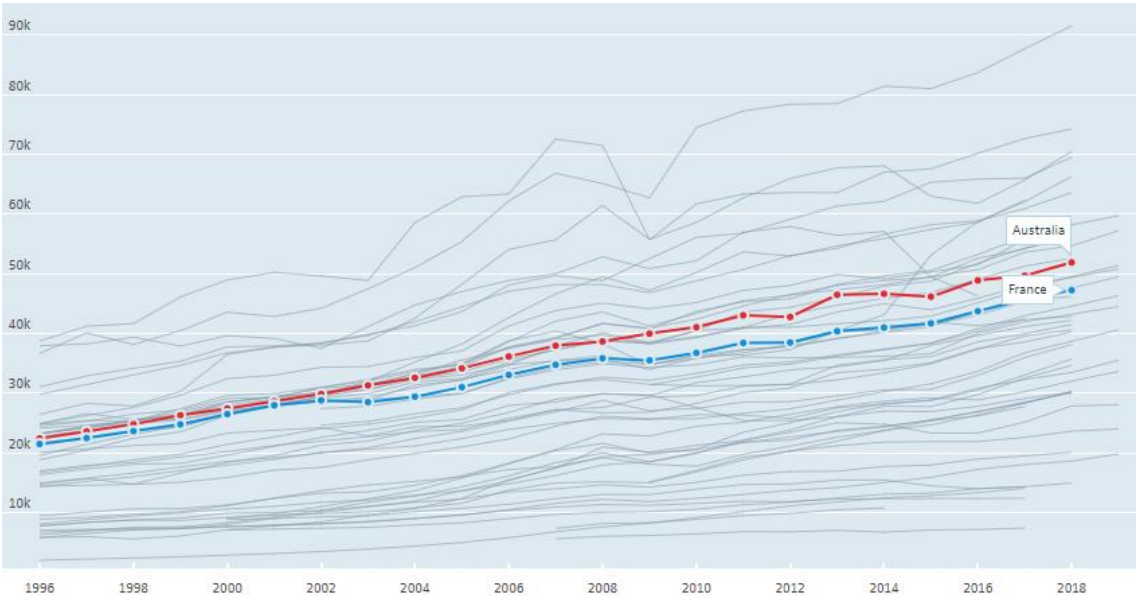

Figure 24 - Gross National Income 2018. Source: (OECD, 2020d)

Furthermore, the General Government Deficit in Australia was -0.49% of GDP in 2018, there is no figure available for 2019. The indicator in France was -3% of GDP in 2019, -2.27% in 2018 (Figure 25).

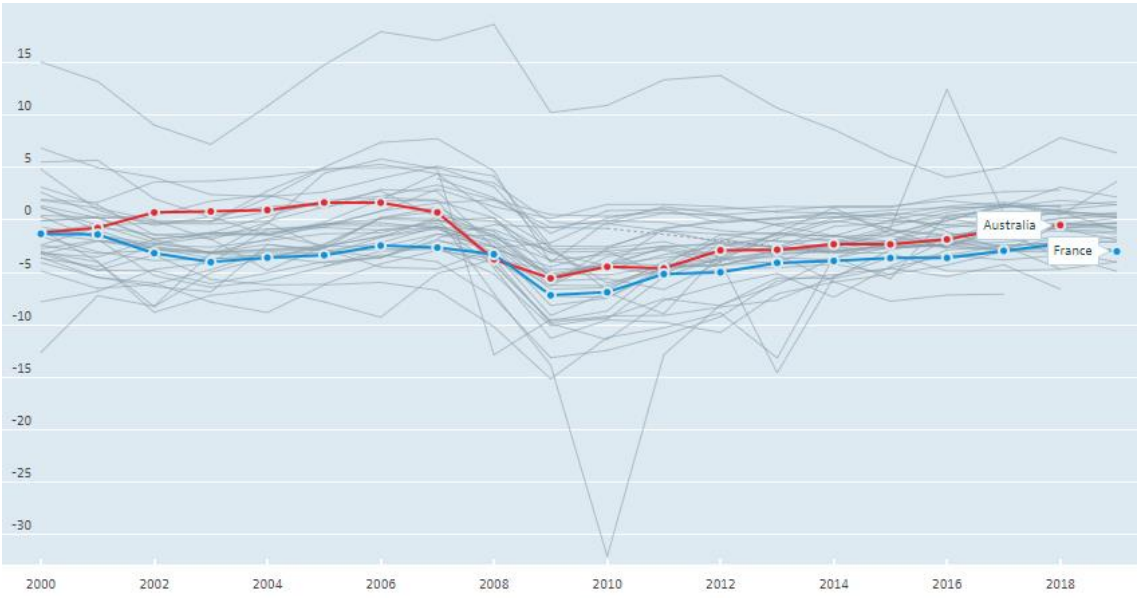

Figure 25- General Government Deficit graph. Source: (OECD, 2020a)

The unemployment rate in Australia (Figure 26) was at 5.16% in 2019, a decrease from the rate 5.30% in 2018. While in France, the rate was at 8.45% in 2019, also experienced a fall from the 9.03% rate in 2018.

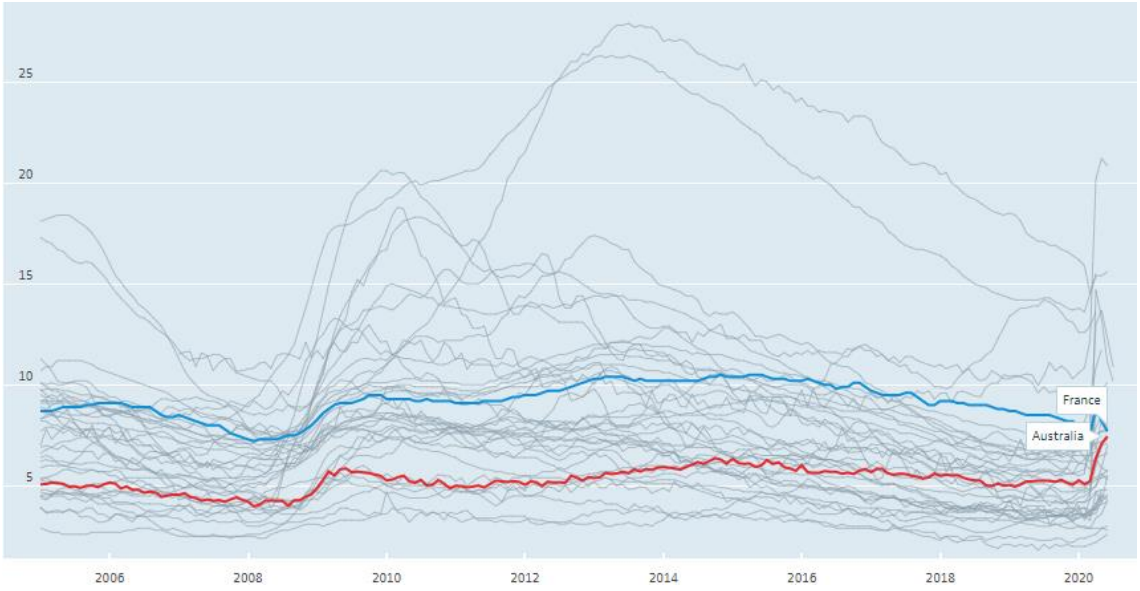

Figure 26 - Unemployment Rate graph. Source: (OECD, 2020e)

The Business Confidence Index (BCI) (Figure 27) fluctuated in recently years but remained above 100 in Australia up to 2019, followed by a sharp decrease below 100 in 2020. France, on the other hand, had a fall below 100 only in 2020. Both countries face the lowest figure in the BCI since 2009.

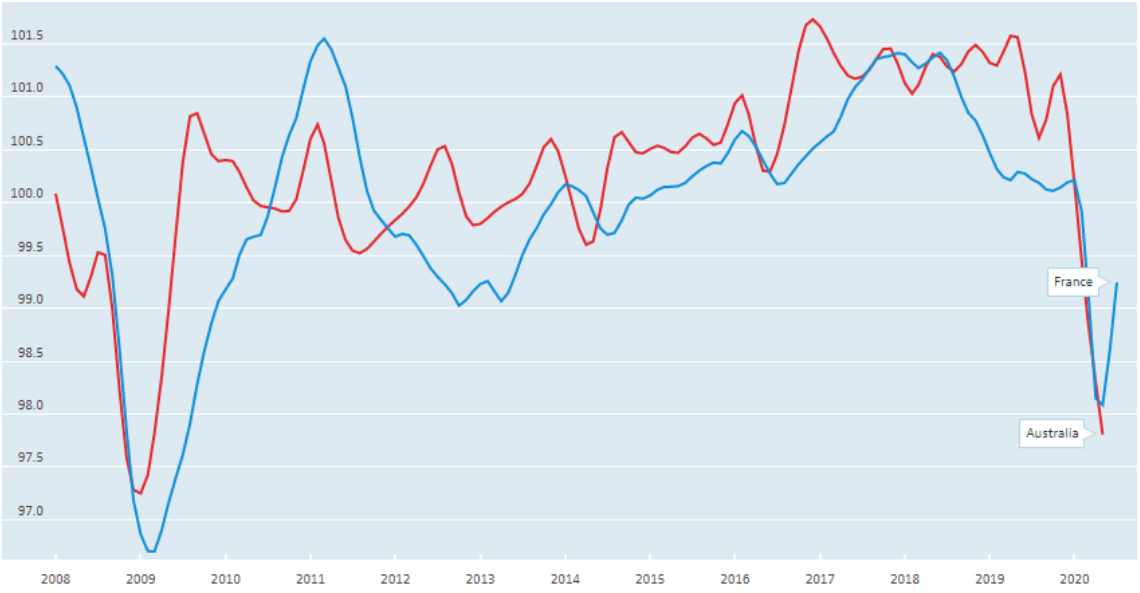

Figure 27- Business Confidence Index (BCI) graph. Source: (OECD, 2020b)

Regarding the Consumer Confidence Index (CCI), Australia managed to keep its indicator above 100 from late 2017, up to early 2019 when it steadily decreases. France saw a sharp decrease below 100 during 2018, followed by a sharp increase above 100 in 2019, falling again in 2020 (Figure 28).

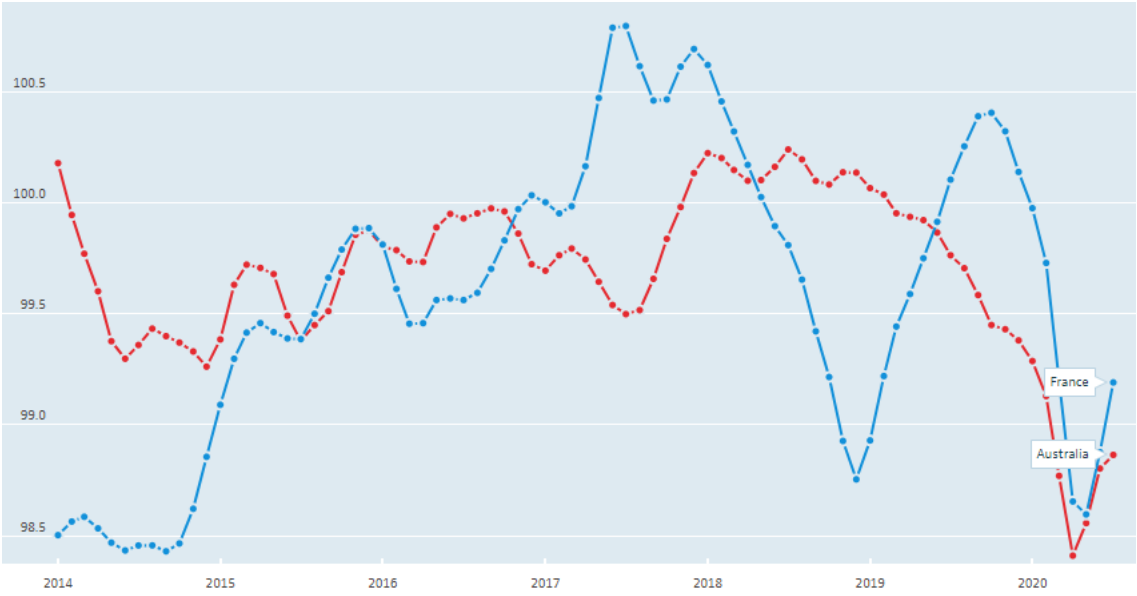

Figure 28 - Consumer Confidence Index (CCI). Source: (OECD, 2020c)

Trust in Government reflects the share of respondents that have answered yes when asked if they had confident in the national government. The metric is published every three years, and the percentage considers the full period to improve the accuracy of the results, so the percentages shown (Figure 29) comprises answers from 2015 to 2018.

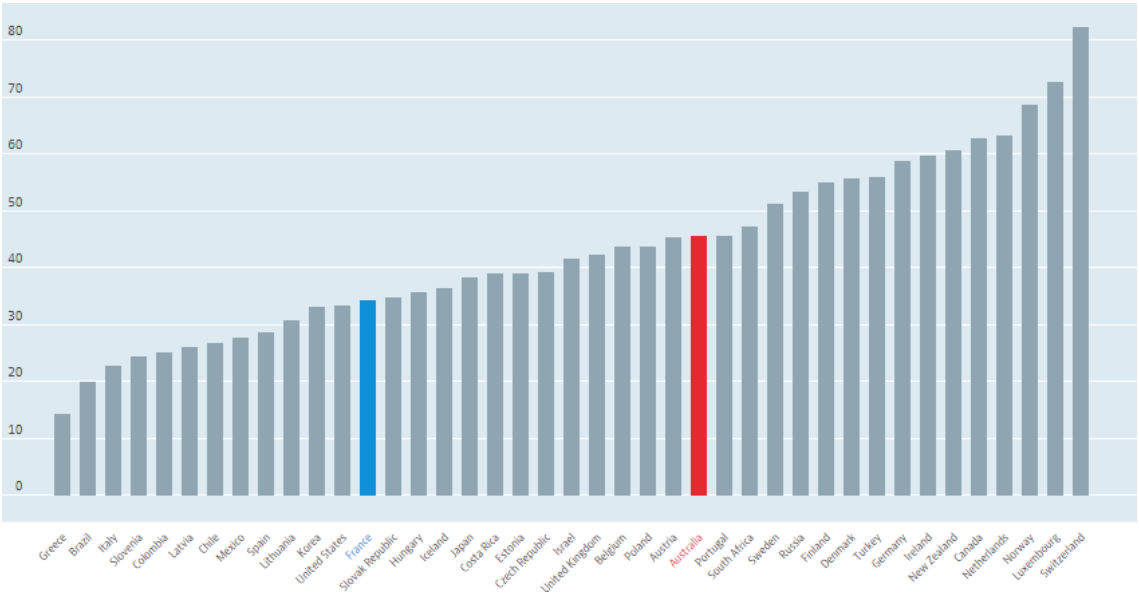

Figure 29 - Trust in Government graph. Source: (OECD, 2018)

5.2.2 *Financial Services*

In this section of the chapter, the study assesses two of the largest financial service companies in Australia and in France. All the financial information here contained were taken from the companies' annual reports and climate strategy support documents.

AUSTRALIA

Australia and New Zealand Banking Group (ANZ) is among the top 30 listed companies in the world and it is one of the six largest list companies in Australia. In its 2019 annual report the group has stated as purpose to shape a world where people and communities can succeed, and is currently focusing efforts on improving financial wellbeing of society, supporting business and financial practices that improve environmental sustainability, and improving the availability of sustainable and affordable housing (ANZ, 2019b). The liquidity coverage ratio of the company averaged 140% for 2019, greater than the 138% in the previous year, and above the minimum required of 100%.

Supported by the code of conduct, the company has as values integrity, collaboration, accountability, respect, and excellence. The United Nations Sustainable Development Goals (SDGs) aims to respond the biggest challenges faced by the world, ANZ is

committed to assist SDGs in achieving its goals by developing innovative and responsible products and services, meeting stakeholders' expectations.

ANZ has addressed environment and climate on its annual report, stating that it is a risk as the company will continue to face negative impacts to their reputation if fail to address the issue as well as to take consumer consideration when making business decision. However, it also considers climate an opportunity to differentiate themselves from competitor by continuing to listen to stakeholders and strengthening its standards. The company seeks to provide investors and other stakeholders with information to assess how adequate their approach to climate change is, and their ability to risk management.

Environmental Sustainability					
Fund and facilitate at least AU$15 billion by 2020 towards environmentally sustainable solutions for our customers (AU$ billion cumulative total)[13]	19.1	11.5	6.9	2.5	–
Environmental footprint					
Total scope 1 & 2 GHG emissions (tCO_2e)	156,568	171,012	180,993	193,569	209,531
Total scope 1,2 & 3 GHG emissions (tCO_2e)	250,857	266,906	273,216	299,224	335,085
Project finance portfolio[14]					
Renewables (%)	83	76	70	63	60
Coal (%)	9	10	16	19	18
Gas (%)	8	13	13	18	22
Project finance commitment to renewable energy ($m)	1,371	1,076	1,141	875	881

Table 2 - ANZ Performance Overview Environmental Sustainability. Source: (ANZ, 2019b)

For three consecutive years following the Task Force on Climate-related Financial Disclosures (TCFD) which has as an objective to increase transparency, ANZ was the first bank globally to align disclosures to TCFD recommendations (ANZ, 2020). In 2019 the group focused on researching and providing training on climate risks and opportunities; on engaging with largest-emitting customers to understand their transition plans; on feeding results into their portfolios in particular for the energy, transport, construction, and agricultural services; and on identifying climate change as principal risk and uncertainty

The company counts with an EESG Committee that provides an oversight of measures and to align with its purpose, focusing on ethical, environmental, social and governance issues. As demonstrated (Table 3), the most material climate change risk arises from lending to corporate and retail consumers, as well as credit-related losses

when a customer is unable to repay liability. These risks are assessed every six-months or more frequently, considering a maximum of 6 years for future assessment.

Group lending profile	2019	2018	2017	2016	2015
Total group EAD ($b)[1]	**977**	944	903	894	903

Exposure at default (EAD) as a % of group total[1]	2019	2018	2017	2016	2015
Consumer Lending	**37.6%**	39.7%	41.5%	40.6%	38.6%
Finance, Investment and Insurance	**20.3%**	19.6%	17.2%	17.4%	18.8%
Property Services	**7.0%**	6.8%	6.6%	6.8%	6.6%
Manufacturing	**5.1%**	4.6%	4.5%	5.2%	6.3%
Agriculture, Forestry, Fishing	**3.6%**	3.7%	3.8%	3.9%	3.7%
Government and Official Institutions	**7.3%**	6.9%	7.2%	6.2%	4.6%
Wholesale Trade	**3.0%**	3.0%	3.0%	3.1%	3.9%
Retail Trade	**2.2%**	2.2%	2.3%	2.4%	2.6%
Transport & Storage	**2.2%**	2.0%	2.0%	2.2%	2.3%
Business Services	**1.6%**	1.6%	1.7%	1.7%	1.9%
Resources (Mining)	**1.8%**	1.6%	1.5%	1.8%	2.2%
Electricity, Gas and Water Supply	**1.3%**	1.2%	1.3%	1.3%	1.4%
Construction	**1.3%**	1.4%	1.4%	1.4%	1.6%
Other	**5.8%**	5.7%	6.0%	6.0%	5.5%

Table 3 - ANZ Business Lending. Source: (ANZ, 2019b)

ANZ have financially assessed each one of these risks and some others (Table 4). Reputation risk related to climate change was assessed as very likely to occur in a current time horizon, resulting in a high impact magnitude. The potential financial impact figure arising from this risk was AUD 9,100,000,000 (ANZ, 2019a), which was explained that damage to reputation can decrease the brand value significantly. Acute physical risk also stands out for having a short-term characteristic and a medium-high impact, having a potential financial impact of AUD 5,100,000,000, as climate change can impact property assets and associated infrastructure.

	Risk	Time Horizon	Likelihood	Magnitude of impact	Potential Financial Impact
Regulation	Particular customers may be negatively impacted by the Paris Agreement.	Short-term	Likely	Medium-low	400,000.00
Market	One of the greatest risks arises from lending to companies with large exposures to high carbon assets. In response to these market risks, the company expects customers to revise their business strategies and deliver enhanced disclosures, preferably aligned with the recommendations of the FSB Taskforce on Climate-related Financial Disclosures (TCFD).	Short-term	Not assessed	Not assessed	-
Reputation	ANZ believes that it is important to understand the social and environmental risks associated with their lending decisions to avoid reputational and economic loss associated with customers that may not be managing these risks appropriately or are engaged in activities that are not sustainable in the long-term.	Current	Very likely	High	9,100,000,000.00
Acute physical	ANZ's largest exposures are associated with residential mortgages in Australia and New Zealand. To protect ANZ from these events, all property mortgaged by ANZ must be insured under a policy acceptable to ANZ. If insurance over the mortgaged property is cancelled or declined, this may present grounds for a loan default.	Short-term	Likely	Medium-high	5,100,000,000.00

Table 4 - Risk types considered in ANZ's climate-related risk assessments. Source: (ANZ, 2019b)

The assessment considers that customers could not be able to repay a debt due to impacts cause by natural disasters, or by change in regulation on climate change adaption and mitigation, as well as changes to cost and insurance cover. Recognizing the different levels of risk and exposure, ANZ expect that in the future other business public disclosures can assist on understanding and to be prepared to work with their climate-related risks and opportunities.

Ernst & Young (EY) has reported that full-cash operations for the financial services industry fell in 2019, representing the lowest figure since 2012 mostly due to natural disasters in Australia. Banks have highlighted that trends remain negative due to changing in society expectation, and it characterizes a new era for the industry. However, it also highlights that it comes with opportunities for those prepared for transformation.

FRANCE

Crédit Agricole Group, also known as the green bank due to its relationship with agriculture, is the largest retail group in France, the largest bank insurer in Europe, and the number one bookrunner worldwide for green bonds. Having as values transparency, closeness to customers, accountability, and openness, Corporate Social Responsibility plays vital role in the business. The liquidity coverage ratio of the company was 129.8% for 2019, better than the 110% goal, and above the minimum required of 100%.

For ten years the company has aimed to conduct its activities in a responsible way as regards to its stakeholders, making green finance one of the group's growth driver. Understanding the complexity of this undertaking, the company has mobilised all its business lines and strategies in a collective effort, becoming fully committed and aligned with the Paris Agreement. This strategy will enable the bank to gradually relocate its products and services under management portfolios aligned with energy transition.

Implementing an innovative governance, the commitments are driven and structured around five pillars, allowing the group to constantly assess development in different regions. The pillars are: i) a societal engagement committee which is in charge of aligning the group's climate strategy with the Paris Agreement ensuring that every business line is included; ii) a scientific committee in charge of conducting high level scientific analysis; iii) a system designed to direct decision making; iv) regularly revise policies aligning with recommendations from the scientific committee; and lastly v) climate will be reported according to the Task Force on Climate Change-Related Disclosures (TCFD) recommendations.

The group believe it is of vital importance that companies are prepared to mitigate the effects of climate change, and have set as their role as a key economic contributor to support those business on the transition by measuring the client's contribution and capability of adapting their practices to combat climate change. This transition scoring was at first implemented to large business in 2020 and will supplement existing financial score, serving as basis for discussion and decision making.

The overall risks exposure of Crédit Agricole is summarized as: corporate loans present the largest risks to the company, followed loans to central governments and banks,

and retail customers loans (Table 5). The group has assessed that its highest exposure if located in France (Figure 30).

Overall risk exposure (credit, counterparty, dilution, settlement and delivery) at 31 December 2019

31/12/2019 (in billions of euros)	Standardised				IRB						Total		
	Gross exposure[1]	Gross exposure after CRM[2]	EAD	RWA	Gross exposure[1]	Gross exposure after CRM[2]	EAD	RWA	Gross exposure[1]	Gross exposure after CRM[2]	EAD	RWA	Capital require-ment
Central governments or central banks	61.8	61.8	61.7	7.1	218.2	229.7	227.3	2.3	280.0	291.5	289.0	9.4	0.8
Institutions	43.9	59.3	57.4	8.1	103.8	107.9	104.1	16.1	147.6	167.1	161.5	24.2	1.9
Corporates	159.1	138.0	104.0	82.8	390.9	364.9	299.4	133.8	550.1	502.9	403.5	216.6	17.3
Retail customers	44.5	41.3	37.8	23.4	630.2	630.2	629.3	106.4	674.7	671.4	667.1	129.7	10.4
Loans to individuals	30.2	28.6	26.2	16.7	508.8	508.8	507.1	70.6	539.1	537.4	533.3	87.3	7.0
o/w secured by real estate assets	10.4	9.9	9.9	4.3	374.8	374.8	374.8	39.9	385.2	384.8	384.7	44.2	3.5
o/w revolving	4.1	3.9	1.9	1.4	19.8	19.8	17.3	4.4	23.9	23.7	19.2	5.8	0.5
o/w other	15.7	14.8	14.5	10.9	114.2	114.2	115.0	26.3	130.0	129.0	129.5	37.3	3.0
Loans to small and medium businesses	14.3	12.7	11.5	6.6	121.3	121.3	122.2	35.8	135.6	134.0	133.7	42.4	3.4
o/w secured by real estate assets	0.6	0.6	0.6	0.3	22.4	22.4	22.4	6.2	23.0	23.0	23.0	6.5	0.5
o/w other	13.6	12.0	10.9	6.4	98.9	98.9	99.8	29.6	112.6	111.0	110.7	35.9	2.9
Shares	1.2		1.2	1.4	20.7		20.6	71.8	21.9		21.8	73.2	5.9
Securitisations	1.1		0.8	0.5	39.8		39.8	5.0	40.9		40.6	5.6	0.4
Assets other than credit obligation	25.3		25.2	19.2	-		-	-	25.3		25.2	19.2	1.5
TOTAL	**336.9**		**288.0**	**142.6**	**1,403.6**		**1,320.5**	**335.4**	**1,740.6**		**1,608.5**	**478.0**	**38.2**

(1) Initial gross exposure.
(2) Gross exposure after credit risk mitigation (CRM).

Table 5 - Overall risk exposure of Crédit Agricole for year ended 31 December 2019. Source: (Crédit Agricole, 2020).

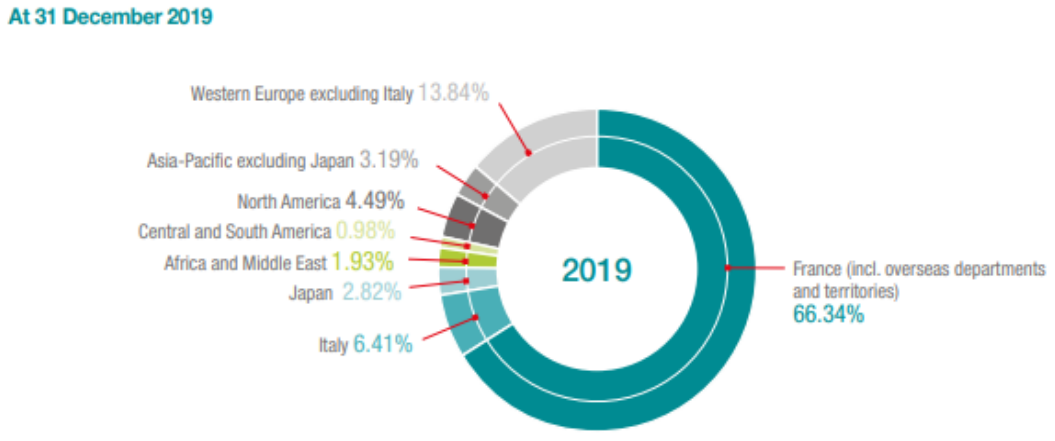

Figure 30 - The geographic breakdown by area of all Group exposures. Source: (Crédit Agricole, 2020)

Managing comprehensively the risks and opportunities associated to climate change, the company has taken a strategy of no longer engage with business generating more than 25% of their turnover in coal-based mining and production, authorizing only loans dedicated to renewable energy or GHG reduction projects. Furthermore, the group have also decided to no longer work with corporations currently developing or planning to develop new thermal coal capacities. Any company failing to comply with the new approach can have financial support frozen. However, Crédit Agricole have launched the LCL Climate Impact Investments, which is the first full line of investments in companies compromised to cut their carbon emission.

5.2.3 *Insurers*

AUSTRALIA

Insurance Australia Group (AIG) is a listed multinational insurance company and it is the largest general insurance company in Australia with 29% of the market (Parliament of Australia, 2020). The company has as purpose to make the 'customer world' a safer place, building a safer and more confident Australia.

Following the recommendations set in 2017 by the TCFD, IAG is one of the 18 insurance companies to have joined the United Nations Environmental Programme Finance Initiative Principles for Sustainable Insurance Initiative. The company have assessed that in a warmer world, cyclones are expected to travel further affecting an additional of 3.5 million people. As a result, significant loss of property assets and personal danger would increase.

IAG has a climate action plan which seeks to adapt thinking to create opportunities to develop new solutions (IAG, 2018), and to collaborate for change where it states that all kinds of organization, big and small, have a role to play in mitigating climate change. Having an objective of providing leadership role for the insurance industry in addressing climate change and setting a standard across Australia, the company aims to shift investments to companies with lower climate-related risks or a forward strategy by 2021. For the same year, AIG expect to integrate climate insights to its strategies. Furthermore, it seeks to lead climate research and analysis to support stakeholders on having a better understanding of the issue.

Recently, the insurance business played key role in the development of the Australian Sustainable Finance Initiative, that aims to pave a sustainable finance roadmap by 2021. The company has also stated to be keen to address climate change impact and believe that creating a disaster mitigation program to reduce the impact of natural disasters can reduce post-disaster recovery costs.

The managing director of IAG has said that led by all level of governments, business and NGOs, society has the responsibility of ensuring preparedness to deal with natural disasters. State and territory governments play a major role in addressing climate change and on how stakeholders respond to the issue, as they have a critical responsibility of influencing prevention and preparedness.

More than nine million people in Australia have been impacted with natural disaster events in the last 30 years. The total economic cost of natural disasters is forecasted to increase approximately 2.5 times from 2017 to 2050 (Figure 31), estimated to reach $39 billion per year by 2050 (Table 6).

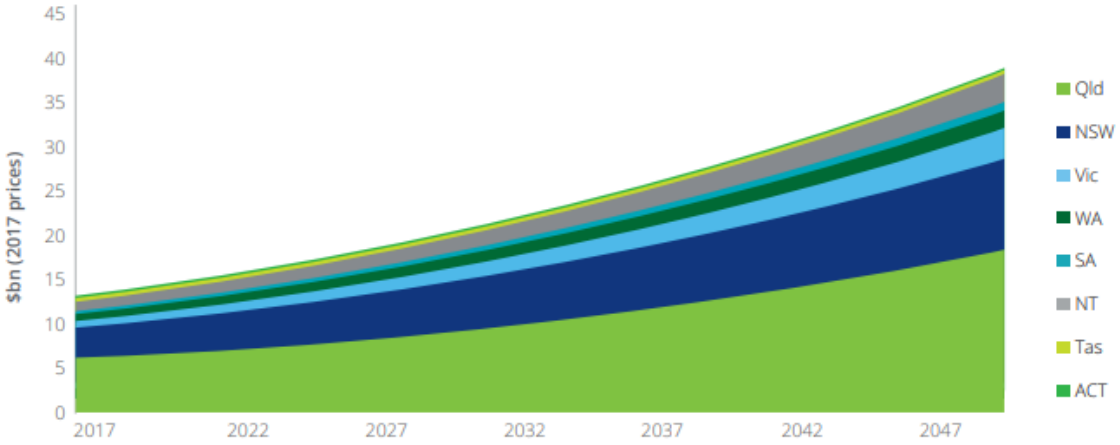

Figure 31- Forecast economic costs of natural disasters. Source: (Deloitte, 2017)

National costs of natural disasters
Total cost of natural disasters 2007-2016: $18.2bn
Percentage of GDP: 1.2%
Total cost of natural disasters today (based on 50 years of data): $13.2bn
Forecast annual total cost of natural disasters in 2050: $39.3bn
Average annual growth in natural disaster costs, 2017 to 2050: 3.4%

Table 6 - National costs of natural disasters in Australia. Source: (IAG, 2017)

KPMG has done a general industry review in 2019 (KPMG, 2019), in which it underlines that the insurance industry faced a US$76 billion loss in the previous year, the fourth highest on record. In 2017, the industry saw the highest loss ever recorded due to large natural events. The report highlights that insurance cover is critical to the financial-sector functioning, as the total economic loss recorded in 2018 is estimated at US$146 billion but 48% of this figure was covered by insurance.

The industry profit for the year ended 30 June 2019 reflects a significant decrease of 12%, mostly due to natural hazards. Insured plays vital role in assisting society to recover from natural disasters however, that social and economic pressure on the sector only tends to increase. For that reason, KPMG evaluates that the sector has changed their way to operate by considering climate-related risks in investment portfolios, and by doing active research to demand better risk modelling.

FRANCE

AXA S.A. is the second largest insurance company in France, just behind the Crédit Agricole Group (Statista, 2020e). Even though climate change presents a complex quantification of impacts on insurance activities, the company follows four core elements of climate-related financial disclosures as such governance, strategy, risk management, and metrics and targets. Not only preparing for adaption, AXA strategy also relies in taking advantage of their expertise to create opportunities for the future.

Having developed a robust Corporate Governance Responsibility (CSR) strategy, the insurance business also considers stakeholders' opinions to better assess future topics of interest. In 2019 the Group conduct an internal risk assessment to identify its main sustainability risks as required by the new EU Non-Financial Directive initiative, and

have identified risks spread within the following categories: human rights risks, social risks, environmental risks and other risks related to business conduct.

AXA also has a responsible investment strategy based in four main pillars: integrating ESG and carbon metrics into investment decisions, seeking to exclude from its portfolio underperforming issuers; excluding companies that face any type of social, ethical or environmental challenges that com damage AXA reputation representing a €7.15 billion in divestments; actively promote green investments delivering positive social, environmental, and financial returns; and acting with stewardship by engaging in ESG and sustainability issues.

The company has been transitioning by converting international climate requirements into quantitative investment targets but has already stated that it is a new and complex risk assessment exercise. After four years in the process, AXA believes that there is no tool yet available capable to deliver a robustly satisfactory risk assessment.

The Paris Agreement have invited all business to relate financial flows in line with the below 2°C global warming. Understanding that climate change presents material transition and physical risks', the company has developed a measurement called "warming potential", which focus on emissions reduction from carbon-heavy industries. Aiming to assist businesses with a forward-looking set of metrics, the methodology assisted the company to understand its investments were not aligned with the 2°C target (Figure 32).

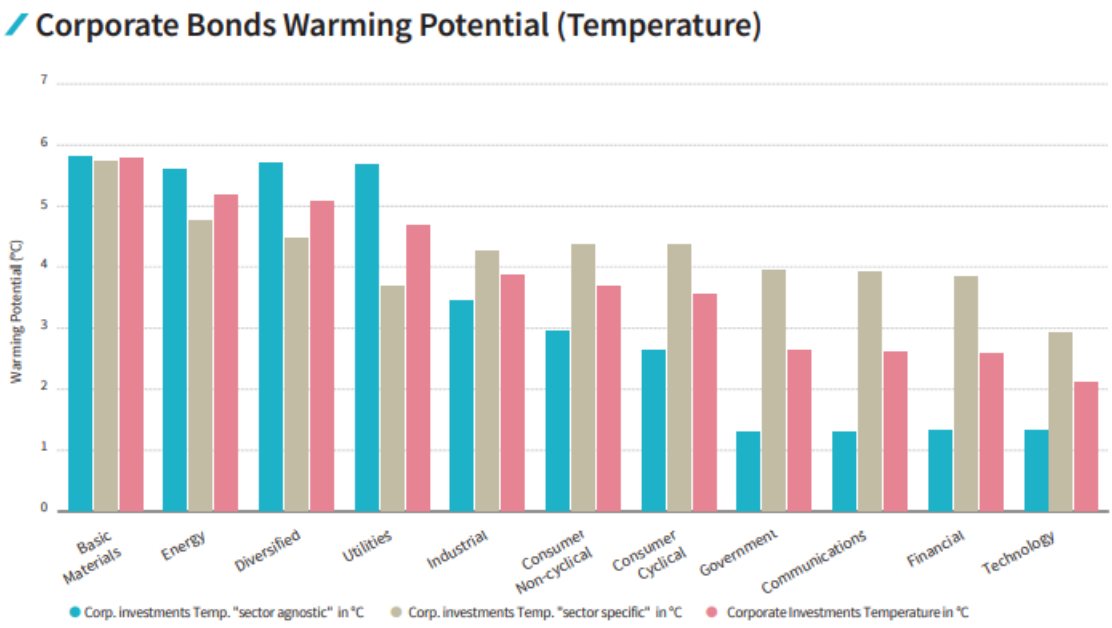

Figure 32 - AXA's portfolio and Warming Potential measurement. Source: (AXA, 2019) Climate Report, page 17.

AXA has also assessed potential annual losses incurring from floods and windstorm (Table 7). France alone has approximately 32% of exposure as it is where about a third of the company's asset is located.

Potential Average Annual Losses to AXA's Real Estate Portfolio Due to Floods and Windstorms

		Floods		Windstorm	
€Million	% of Exposure	2017	2018	2017	2018
Belgium	9.5%	-	-	0.2	0.2
France	31.9%	-	-	0.6	0.5
Germany	12.0%	0.4	0.4	0.2	0.2
Luxembourg	1.0%	-	-	0.0	0.0
Switzerland	35.9%	-	-	0.3	0.4
UK	4.6%	0.1	0.1	0.2	0.1
USA	3.7%	-	-	0.1	0.1
Japan	1.4%	-	-	-	0.1

Table 7 - Potential Average annual losses to AXA's portfolio due to floods and windstorms. Source: (AXA, 2019) Climate Report, page 24.

Ernst & Young (EY) have assessed the insurance industry in Europe and have highlighted that a major climate change event could be devastating to individual insurance companies, however it can also present opportunities to demonstrate leadership providing not only recovery services, but also services that seek to mitigate

risks . The company has also launched a report of the industry in France and have evaluated that net inflows have increased in 2019 (EY, 2020).

The Intergovernmental Panel on Climate Change (IPCC) predicts that industries which rely mostly in natural resources such as agriculture, energy, tourism, and forestry may face decreasing revenue in the coming years (IPCC, 2019), which will directly affect insurance companies.

5.2.4 *Government*

AUSTRALIA

The Climate Change Authority is an independent and expert body with the role of providing advice to the Australian Government on climate change policies. Evaluating the Government's current climate change policy settings, the Authority has launched a research report in 2020 presenting 35 recommendations to assist Australia transit to a greener future (Climate Change Authority, 2020), the main findings and recommendations relevant for this study will be summarized in this section of the chapter.

Starting with long-term strategies it was assessed that a trade and investment strategy and an international climate change strategy should be implemented to the government's plan, resulting in a more competitive Australia. The report also evaluates that policies to support the development of the sustainable finance market should be created, ensuring that businesses are benefited from increasing green investments.

Australia has set an initial emissions reduction target of 26 to 28 per cent by 2030 with Paris Agreement. However, the independent review suggests the government to implement flexible mitigation policies that will later enable the delivery of reductions beyond the target set for 2030, leading the country to a prosperous path to a low emissions economy.

The main sectors to be affected by climate change mitigation are the energy, transport, waste, agriculture and industries in general, creating a direct impact on insurers and financial services Evaluating that the transition will require a preference from both public and private investment for existing and emerging green industries, the report also recommends that a review of the necessary information should be undertaken in

order to assist businesses and investors in understanding and managing climate-related financial risks. Furthermore, the Council of Financial Regulator should create a set of standards to enhance quality of climate change disclosures. Currently, governments and business fail to properly address climate-related risks due to lack of information.

FRANCE

The High Council on Climate (HCC) is an independent body formed by 13 experts. It was created to issue advice on climate and to set recommendations to the French government aligned with the Paris Agreement. In 2019, the body has launched its first Carbon Neutrality report with a set recommendation.

The body has evaluated that there are various policies and measures in place to assess the impact of climate change in France, but when it comes to daily decision-making climate has little weight on arbitrations. The report points the government's responsibility on ensuring that the transition is fully addressed in both laws and regulation and in all public investment decisions.

It is also suggested that the climate policy framework must be reinforced to encourage investors and businesses to reduce their emissions and to invest in climate resilient portfolios, evaluating that the carbon tax is a strong tool for that but needs to be reassessed in depth ensuring its effectiveness.

In addition, it evaluates that the current measures will only result in a marginal emissions reduction and do not support a transition to carbon neutrality. In order to do so, the government must assess consumer behaviour and assist on the development of sustainable finance. Transport, Energy and Agriculture sectors need in particular to be assessed.

In relation to greenhouse gas emissions, the impact of policies and measures in place should be systematically assessed to ensure alignment with climate objectives. Problems identified in an earlier stage can be treated more successfully.

Furthermore, HCC recommends the French Government to ensure the fairness of the transition to a greener country, as it offers different levels of risks and opportunities to different businesses. The sustainable solutions put in place should assist all sorts of sectors.

5.3 Discussion

Evaluated in the Literature Review chapter, climate change is seen as a serious challenge facing society. While the impact on the energy, agriculture and transport industries is very clear, this case study aimed to assess how insurance and financial service companies are dealing with the growing concern. France is considered one of the most forward-thinking countries in relation to climate change policies. On the other hand, Australia has been on the spot due to recent wildfires.

Both financial services companies, Australia and New Zealand Banking Group (ANZ) and the Crédit Agricole Group, have been addressing climate change and implementing practices to mitigate climate-related risks. Following recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), the companies have been including climate change disclosure to annual reports. ANZ, the Australia Bank, details climate risks and opportunities in more depth however the French group Crédit Agricole is reference in implementing innovative and green initiatives to its lines of businesses.

While ANZ have an available robust climate change mitigation plan document and a clear annual report addressing in sections how climate change poses a risk to its services and products, Crédit Agricole have a more concise climate mitigation plan and address climate risks together with other risks and opportunities. It is clear though that both companies are on top of measuring and evaluating this increasing concern.

Crédit Agricole have a very interesting approach of becoming fully committed to the Paris Agreement, implementing a new governance to ensure all the lines of the business are aligned with the protocol. Furthermore, the financial services company has taken an important strategy of no longer associate with businesses heavy in coal-based mining, as well as corporations with thermal coal capacities. It is a clever move as these sectors will be massively impacted with new regulations, which could impact the French company financially and reputationally.

In addition, it has also decided assess portfolios regularly and to freeze financial support to any company which does not comply with the new approach. Crédit Agricole is leader in green finance, and believes that businesses play a vital role on climate mitigation

The Australian bank has also stated on its annual report that will assess customers' climate practices and that it may decide to terminate relationship with those not complying with transition measures. However, ANZ leaves it more open, explaining that the company will understand what the customers' situation is before taking a final decision.

Annual reports year ended 2019 were assessed for this study. ANZ and the Crédit Agricole have a liquidity coverage ratio higher than 100%, which is the minimum required, and higher than the previous year. Financial crises are usually related to concerns about liquidity and solvency of financial institutions.

Moving on to the insurance industry, Insurance Australia Group (IAG) and the French AXA are both quoted companies working all over the world and one of the largest in the Industry in Australia and France. The insurers voluntarily follow recommendations set by TCFD to disclose their climate-related information.

Believing that every business has the responsibility to address climate change, IAG have assessed its portfolio and have decided to change investments to companies with lower climate related risks. In compliance with the Paris Agreement, this will soon become a pattern within all sectors. The company has not yet implemented climate to its strategies but has a roadmap for fully implementation by 2021, when the Australian Sustainable Finance Initiative also aims to have a structured sustainable finance data base.

With costs arising from natural disasters expected to be around $39 billion per year by 2050, Australia has to take climate more seriously. As evaluated by KPMG, insurers have a massive liability to keep the financial service working, and therefore should create prevention services instead of only offering recovery packages.

AXA has already decided to exclude from its portfolio any investment in companies that faces any type of social, environmental, or ethical issues, estimating €7.15 billion in divestments. This strategy can sound a little hard for some, however the company understands that the reputational risks related to climate change can result in a massive loss.

In EY Insurance Industry report, the company has evaluated that companies have the opportunity to grow. Different from the Australian market, the sector in France saw an increase in net flows in 2019.

The governments in both countries have been addressing climate change. However, the French government shows more preparedness to deal with the issue setting higher targets with the Paris Agreement. The EU is particularly strong in creating policies to address and mitigate climate change, which gives the French government an advantage. However, as evaluated by the independent bodies the Climate Change Authority and High Council on Climate, both governments' policies and measures implemented so far offer room for improvement.

The main recommendations are basic the same for both countries, to review and strengthen the information available to investors and businesses on climate change-related risks, and to ameliorate or create policies to support sustainable finance.

The Climate Change Authority has assessed an important matter, pointing out that governments and business fail to address climate change as there are not enough information available. Even though a robust research in climate can be found, understanding how it can financially impact a business is still complex. Risks comes with a lot of uncertainties, but longer-term risks are even more complicated to be assessed.

That is one of the reasons for the Australian Consumer Confidence Index (CCI) have constantly dropped below 100 in 2019. On the other hand, the French Index was sharply increased above 100 in the same year. The Business Confidence Index (BCI) remained above 100 for the same period. Both countries indexes dropped in 2020 but that is due the covid-19 pandemic uncertainties. To explain, an index greater than 100 demonstrates confidence towards the economic situation in the future while an index below 100 indicates pessimism towards the direction the economy may take.

Both Gross Domestic Product (GDP) and the Gross National Income for Australia and France have constantly increased. From 2018, the unemployment rate in both countries have fallen 0.14% and 0.58% respectively. The General Government Deficit for both countries are negative, showing that government expenditure is greater than revenue.

Even though all the figures seem very positive, it is important to remember that the economy can flip depending on the uncertainty of the market. Now, in 2020 the world faces a healthy crisis due to the covid-19 pandemic, leaving specialists wondering what the financial impacts will be in the following years. Climate change has been put in second plan by many governments. Australia is facing a recession due to the natural

disasters that destroyed part of the country in 2019 and the current healthy crisis, France on the other hand have been on top of climate policies.

If climate and environment is not addressed with the same responsibility as it was seeing in the previous year, the economy that is already weakened by the current situation can be aggravated. Public and businesses confidence have already fallen in 2020, if the world is already not facing a financial crisis, it might be sparked by climate-related uncertainties as in an economy with systemic failures natural disasters can become a dimensional threat.

5.4 Conclusion

This chapter have assessed the main research question of this study: how climate change could result in the next financial crisis if not properly addressed.

Investors, companies, governments, and other stakeholders have taken a different approach to climate change since the Paris Agreement was settled. 2019 is characterized as the year of a long path to mitigate the effects of this growing concern, with the highest number of registered climate policies and initiative than ever.

The proposed case study has assessed two of the largest insurance and financial service listed companies in Australia and France, as well as the governments' climate actions and some financial indicators to evaluate the financial position of the countries.

Both countries have addressed climate change. The Australian government has been criticized for developing what is said to be easy and not sufficient targets in line with the Paris Agreement guidelines. France in the contrary, has mastered in setting outstanding targets of a low carbon emission economy, and it is known as a leader in climate change policies. Even though there is a difference in how the governments have been conducting the topic, both Australia and French banks and insurance companies here analysed seemed to have a very similar approach. Both have been following the TCFD recommendations in climate change-related financial disclosures.

As evaluated within the case study, governments play a vital role in setting an example, providing information, and most important in creating an environment for businesses to success in the transition to a greener economy.

The biggest concern is that the world has now faced a pandemic which has led to a healthy crisis. Will this result in companies and governments changing their approach

to climate change in the year to come? This study has assessed that companies understand the importance of assessing climate change as a current risk has evaluated that sustainable finance is a vital tool for the transition to a low emission economy. Having achieved insight into the mechanisms employed in both France and Australia to address climate change risk, Chapter 6 will conclude the study by integrating the results derived from the stakeholder study with these insights.

6 Concluding Thoughts on the Contribution of this Research, its Limitations and Suggestions for Further Research

6.1 Contributions and Limitations of the Research

Largely considered as only a Corporate Social Responsibility issue, this study contributes to a better understanding of climate change risks and identifies that risk management should be at the centre of a climate mitigation and adaption plan. The findings of this research are expected to assist business with climate change financial disclosures, as well as to understand the importance of sustainable finance as part of the climate change solution.

However, there are a number of limitations which might have affected the outcome of this research, including time constraint, sample size, respondents' personal influences, and the current healthy crisis.

The time constraint is one of the biggest limitations of this research as the research had to be conducted within a limited period, affecting then the sample size achieved with the survey and the case study. Other limitations and implications are further discussed in the next sections, as well as future research recommendations.

6.2 Recommendations for Practice

The investigation revealed that large companies in France and Australia have already implemented or are on the way to implement sustainable practices that benefit the environment. There is still a long path to be crossed to drive the economy to an acceptable low emission level; businesses, investors, governments, and individuals must work together to achieve the 2030 Paris Agreement targets.

Governments around the world may focus on delivering equal opportunities to small, medium, and large business to transit to a greener place, by creating initiatives and regulations that incentive directors and shareholders to be act with responsibility and accountability.

Sustainable finance has been evaluated to be successful in driving companies to reduce or remove investments in businesses whose output offers harm to the environment. 2020 onwards is believed to be the decade of investment and expansion of sustainable financial initiatives, offering a massive opportunity to businesses and governments of all sizes to set an example.

6.3 Implications of Findings for the Research Questions and Recommendations for Future Research

The concept is relevant, but methodology challenges remain significant. There are various aspects that can be further developed in order to make future research more meaningful.

Area and country of study:

The present research has focused on analysing large financial institutions as it was assessed to represent greatest threat to the economy. Future researchers can analyse other industries at risk due to climate change, and considerer assessing medium and small businesses as those may suffer the most if not prepared to deal with risks related to natural disasters.

Furthermore, this study has chosen to evaluate developed countries France and Australia as potential economies. As a result, even though both countries have been addressing and acting on climate change-related risks, France seems to be slightly more prepared. Australia has been assessing the issue and might be in a different position in the years to come depending on its actions during the pandemic. Future research may have a different conclusion as the economic outcome may change for both countries as the is currently facing a healthy crisis.

Researchers may choose to assess countries in development to have a different view of how climate change is affecting these economies specifically. Also, countries that have not been addressing climate change at all can also provide great insights of how economy can be impacted.

Health crisis:

As previously stated, the world has been fighting a health crisis which impacted the outcome of this research. Figures were analysed up to 2019 in order to not have the study compromised by the current crisis.

Future research has ground to explore if the pandemic has affected how climate change is perceived and addressed around the world.

Inclusion of other financial indicators:

This study has selected some financial indicators to be analysed that were appropriated for the research purpose.

Future studies may decide to include other indicators such as the consumer price index, industrial production, stock market, bankruptcies related to climate change and currency strength.

Furthermore, there are not sufficient financial indicators directly associated with climate change. Therefore, the outcome of a financial crisis is mostly an interpretation of a hypothesis. Futura research have the opportunity of assessing if indicators are created with that purpose.

These additional indicators will improve the analysis and identify if the performance of the study would be significantly affected.

Survey population:

This study has focused on delivering an international view for the survey results by having participants answering from all over the globe.

Future research may focus specifically on the population of the country or countries of study, as it will improve the findings of the research by giving a better view of how climate change perception and awareness has influenced companies and governments on that specific location.

6.4 Final Conclusion and Reflections

Being considered one of the biggest challenges of current times, climate change has changed the world's course in 2017 when the global temperature reached approximately 1°C above pre-industrial levels. For that reason, governments and policy makers around the world decided to come together and to form a legally binding agreement which has been changing the way businesses operate.

The Paris Agreement is an important mark on climate change mitigation, as it sets targets and recommendations to drive society to a low emission world. With that, in 2019 policy makers have created hundreds of policies and regulations aiming to reduce and even to remove high levels of pollutions, however many of those policies are still in implementation phase.

Large businesses have been preparing for a climate transition for many years and are well prepared to fight this growing concern. However, it takes companies, investors, governments, and other stakeholders to work together to achieve the targets set. Climate has to be seen as more than a reputational risk, but as a financial risk that if not effectively addressed will destroy economies. The financial crisis of 2008 happened mostly due to the amount of risks that were not being considered within the housing market, climate has a characteristic of slowly become the biggest threat the world economy will face in the years to come.

Having physical, transition and liability risks as the main threats, financial institutions are predicted to be the most affected. Due to their characteristics of directing the financial market, many companies around the world have already created safeguards such as taking recommendations from the Task Force on Climate-related Financial Disclosures (TCFD) which aims to bring transparency.

Governments can regulate the way businesses behave in different levels by creating minimal standards for business performance within a legal framework (Singhal, 2014). Examples of this include creating laws and regulations; implementing tax incentives and penalties; ensuring that business have access to any information needed by facilitating understanding of minimum legal requirements; supporting voluntary certification; engaging stakeholders in initiatives-creation process; and in offering education and awareness programmes. These conditions should enable and encourage business activities to minimise social and environmental impacts while maximizing profits.

The French government has been seen as reference when creating climate policies, while Australia it has been criticized a few times for climate denial. However, despite of the governments' actions, all the four companies analysed in the research seems to be well positioned in addressing climate issues. Even though all the results here assessed seem to be very positive, it is necessary to keep in mind that climate brings financial instability. Depending on future events, it can spark a financial crisis is not constantly assessed.

Engaging stakeholders in the creation of environmental policies and offering education are the main points to, together, create a successful mitigation plan for climate change.

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Appendices

Appendix A – Survey Questionnaire

Climate Change Awareness and Perception

Climate change is considered one of the biggest challenges of current times, and as a result it has been broadly discussed within the political, economic, and social environment. Even though it seems that some progress has been made, the transition to a "greener world" still faces many challenges.

This survey is being used as a complement to a broader study which aims to evaluate how climate change poses a serious risk to the economy. Hence, audience opinion is vital to formulate future environmental policies and initiatives. The survey is focused on understanding public perception and to identify how it can potentially influence businesses and governments' actions in relation to climate change mitigation.

All Information obtained from the survey will be used for dissertation purpose only, there is no collection of private information and data will be kept anonymous.

1) Where are you located?

Europe / Africa / Antarctica / Asia / Australia & Oceania / North America/ South America

2) What is your age group?

Under 20 / 21 – 29 / 30 – 39 / 40 – 49 / 50 – 59 / 60+ / Prefer not to answer

3) What is the highest level of education you have completed?

High School / Bacharelor's Degree / Master's Degree / Ph.D. or higher / Prefer not to answer

4) If you are currently employed, in which of the following sectors do you work?

Governmental Institution / Public Institution / Private Sector / NGO / Academia / Other / Not currently employed

5) How informed do you believe to be on climate change? Please rate 1 to 10, where 1 represents not informed at all and 10 very well informed.

1 to 10

6) Do you consider environment when making decisions by:

Please select one	**X**
Waste recycling	
Reducing water consumption	
Reducing energy consumption	
Purchasing environmentally friendly products	
Alternative way of transport	
Other: ____ (please specify)	

7) Considering your knowledge about climate change and its risks, how likely are you to support companies which demonstrate their concern about the issue?

Highly unlikely / Unlikely / Occasionally / Likely / Highly likely

8) Would you stop consuming a product or service because it causes damages to the environment to any extent?

Definitely would not / Probably would not / Probably would / Definitely would

9) Have you ever had any physical losses due to natural disasters?

Flood / Drought / Cyclone / Hurricane / Bushfire / Other / Never

10) Are you aware of policies introduced by companies and governments to mitigate climate change?

Yes / No

11) Are you aware of policies created in the country you are located?

Yes / No

12) How much do you think climate change can threaten the economy?

No threat / Minor threat / Some extent of a threat / Considerable threat / Major threat

13) Please rank the following stakeholder groups in terms of the extent of responsibility you consider they have to address climate change, where 1 represents the least responsibility and 4 represents the greatest.

Rank	**1**	**2**	**3**	**4**
Individuals				

Governments				
Business and Industries				
Environmental Organizations				

14) To the best of your knowledge, do you think the following are creating initiatives to address and mitigate climate change? Yes / No / To some extent

Rank	**Yes**	**No**	**To some extent**
Individuals			
Governments			
Business and Industries			
Environmental Organizations			

15) Do you have any further comments or suggestions that could be used to improve climate change mitigation?

Please type answer