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**Corporate greenwashing: does it really add value?  
From the need of a system of measurement to the  
role of managers and policymakers**

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A mia Madre, a mio Padre,  
a me stesso ed alla mia mentalità incredibile.

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# Abstract

The main focus of the thesis is to introduce the threatening phenomenon of greenwashing, with particular attention to that generated by corporations, and analyze the pivotal root causes that might be accountable for its generation so as to allow managers, policymakers, and other organizations to take the right actions against it.

Therefore, before digging into the determinants engendering the aforementioned plague, we will primarily discuss the boundaries within which we need to collocate the concept of corporate greenwashing. In particular, we will refer the increasing interest toward the achievement of sustainable goals that has been fascinating both investors, policymakers, companies, and NGOs from the Paris Agreement all the way to COP26, where not only stakeholders stressed the focus on climate but also on CSR goals. Therefore, whenever we talk about corporate greenwashing, we will often refer to the more general context of CSR issues.

Secondarily, we will explore the two paths leading up to this problem and being generally embodied by both external and internal drivers.

Among the former, we can claim the responsibility assumed by governments that - by choosing a policy rather than another - have the power to drive companies toward the adoption of different kinds of green investments which can be more or less oriented to innovation. Hence, we finally propose some pieces of advice that policymakers should follow in order to achieve a more dynamic and innovation-driven set of policies, among which one of them is essentially represented by the need of measuring the greenwashing level of a company, hence three different systems of measurement are presented.

Among the latter bunch of causes, the responsibility assumed by companies is instead of pivotal importance not only due to the fact that managers need to understand that there is a strong linkage between business and societal results, but also because they need to accept the fact that each company has to focus the CSR issues it is able to address, and does not have to pretend to solve all the issues at once. Moreover, as well as in the previous case, pieces of advice are given to companies in order to improve the quality of their choices in the boundaries of the obtainment of CSR and business goals. Lastly, some information concerning the behavior that should be adopted by NGOs are shared.

# Chapter 1: Introduction: from the Paris Agreement to the concept of Sustainable Finance

## 1.1 The Paris Agreement

On 22 April 2016, the Paris Agreement was ready to be signed at UN Headquarters in New York by countries from all over the world and would have become effective 30 days after the signature of at least 55 countries accountable for 55% of global CO<sub>2</sub> emissions (UNFCCC 2022).

The reaction triggered worldwide was quite immediate, so that the Agreement became effective on 4 November of the same year. However, after five years the number of participants rose by less than 12% leading the overall number to 195 parties, European Union included (Statista 2021).

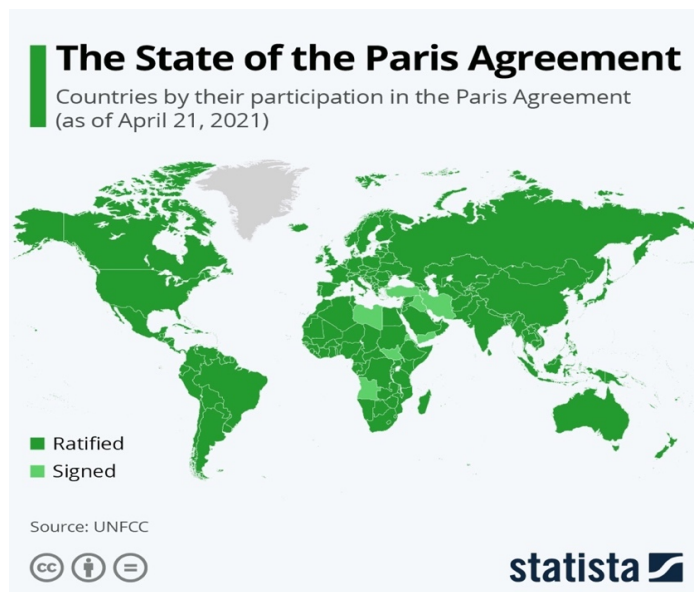


Figure 1.1: The State of the Paris Agreement (Statista 2021)

Mainly, the idea of this agreement was brought to the table of major global political players for the first time at the 2015 United Nations Climate Change Conference in Paris with the objective of creating a network of countries eager to coping with the huge problems intertwined with climate change.

Moreover, from the moment of the signature onwards these Parties were legally bounded in order to pursue the objectives of (Climate Focus 2015): mitigation, adaptation, and action.

Chasing after mitigation – according to Art.2 and 4 of the Agreement- means that countries are committed to slow down their greenhouse gas emissions (GHGs) with particular attention to CO<sub>2</sub> so as to limit global warming up to 2°C - most suitably 1.5°C - with respect to pre-industrial levels by the end of the century.

Conversely, with the term “adaptation” – as mentioned by Article 7- is meant that the cooperation among Parties needs to go in the direction of sustaining those areas on the frontline and resulting to be highly impacted and proved by the climate change scenarios.

Finally, as made clear by Art.9 and 10, both the concepts of mitigation and adaptation need to be balanced and supported by developed countries through financial and technological actions such as Climate Finance and technological transfer. However, among the other actions to be undertaken, it is also cited the concept of capacity building, meaning that not only developing countries should passively receive financial and technological aids, but they should also strive for progressing and exploring new paths.

## **1.2 From the Paris Agreement to COP26**

If on one hand it is remarkable that the Paris Agreement called up countries for common actions, on the other hand we need to observe that it just embodies the starting point of a process that unavoidably needs to be continuously updated.

For this purpose, the UN assigned to the Intergovernmental Panel on Climate Change - also known as IPCC - the pleasure of carrying out an assessment on what it would look like to have a temperature increase of 1.5°C and above with respect to pre-industrial levels.

This work (Allen et al. 2018) shows that the Agreement is weak in defining its own climate and environmental objectives due to two major points. Firstly, it does not specify the temperature increase from a practical standpoint, reason for which the IPCC considers in its report the amount of warming as the increase in the 30-year global average of air temperature over land and water temperature at the ocean surface. Then, it does not give a specific reference point in time starting from which to calculate the temperature increase, though the report uses the 1850-1900 pre-industrial temperatures.

By adjusting these two important misinterpretations, the IPCC mainly found that while up to 2015 the Earth increased its temperature by 0.87°C, in the aftermath of COP 21 human-induced warming would need to be accounted for 0.2°C per year. Therefore, according to

these findings the globe reached an increase close to the Celsius degree by 2017. In other words, keeping this pace would lead up to reaching a jump of about 1.5°C by 2040, much before the very end of the century.

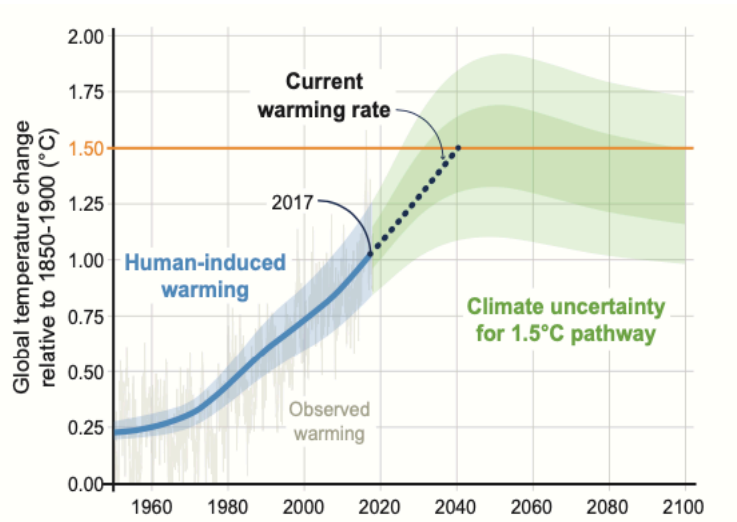


Figure 1.2: How close we are to 1.5°C? (Allen et al. 2018)

Therefore, in order to decrease the inclination of the curve shown in figure 1.2, an urgent need to action has brought about governments to finally redefine and update each of the three pillars of the Paris Agreement at the Glasgow COP 26 – the most recent conference on climate change concluded on Saturday 30<sup>th</sup> November 2021 (UNFCCC 2021).

According to what suggested by IPCC, in Glasgow countries and key players agreed on the importance of keeping the 1.5°C target alive for the whole environment, and though urged a series of measures to be taken at the level of mitigation, adaptation while clearly stressing out that in the package of actions, Climate Finance needs to play an even stronger role. For this reason, in order to better explain the most updated solutions proposed by policymakers, we will dive in each of the three pillars.

### ***1.2.1 Mitigation and action on coal, electric vehicles, deforestation, and methane***

In continuity with what defined at COP 21, mitigation needs to be intended as the action through which Parties commit themselves to try lowering the risk embodied by climate change through the adoption of policies thought for decreasing GHGs emissions.



In Glasgow, the objectives of mitigating actions have been firstly linked to a global net-zero commitment, and then also referred to a temperature increase not above 1.5°C with respect to pre-industrial level (Climate Focus 2015).

In order to understand how the proposed actions are in line with current issues, we can visualize the overall distribution of GHGs. To this purpose, research published in 2020 (Ritchie & Roser 2020) shows that in 2016 the overall emission amounted for 49.4 billion tons CO<sub>2</sub> equivalent and were split as follow:

- 74.4% CO<sub>2</sub> corresponding to 36.8 billion tons roughly
- 17.3% linked to Methane (CH<sub>4</sub>)
- 6.2% of Nitrous oxide (N<sub>2</sub>O)
- 2.1% flowing from other gases also known as F-gases.

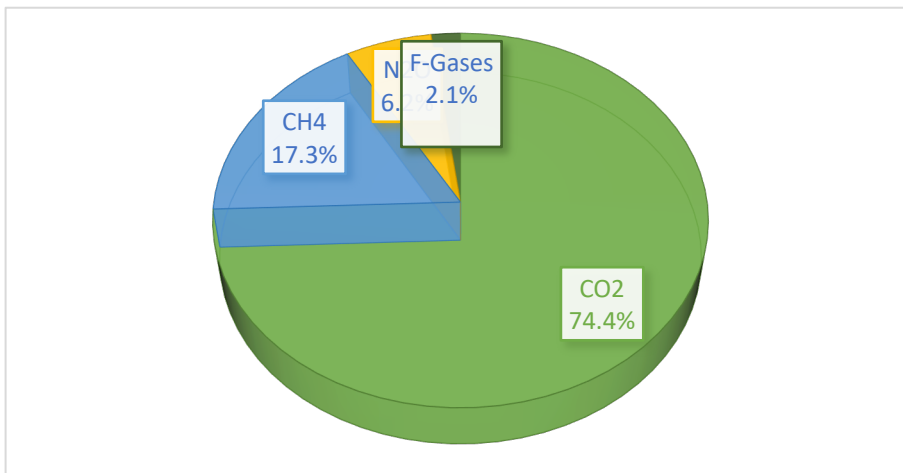


Figure 1.3: GHGs emissions by typology in 2016 (Ritchie & Roser 2020)

By observing Figure 1.3, we can now understand why also at COP 26 the main focus was on strategies finalized at diminishing CO<sub>2</sub> emissions while underlining the importance of themes such as: energy production, transportation and deforestation (UNFCCC 2021). However, for the first time an important consideration has also been given to Methane-related emissions.

If we carefully look at the emissions' distribution across sectors depicted in Figure 1.4, we can notice how almost three-fourth of the global contribution is produced by energy-related activities, while instead almost 20% is caused by agriculture and land usage (Ritchie & Roser 2020).

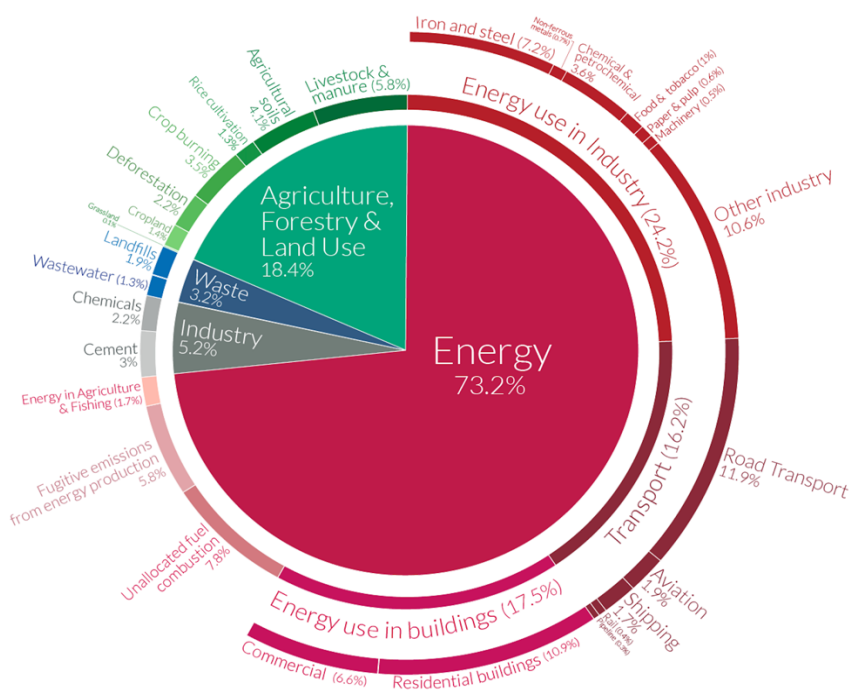


Figure 1.4: CO<sub>2</sub>eq. GHGs emissions by sector in 2016 (Ritchie & Roser 2020)

Therefore, at COP 26 Parties tried finding new specific actions so as to mitigate the impact of energy-related activities.

From a practical standpoint, we know that sources of energy on earth can be split in the following categories: fossil fuels, green sources, and nuclear sources. Of these, the most consistent emissions of carbon dioxide are brought to life by fossil fuels among which we can individuate coal, oil, and natural gas being respectively accountable for 112, 66, and 49 kg of CO<sub>2</sub> for each GJ of heat produced (Jeswiet and Kara 2008).

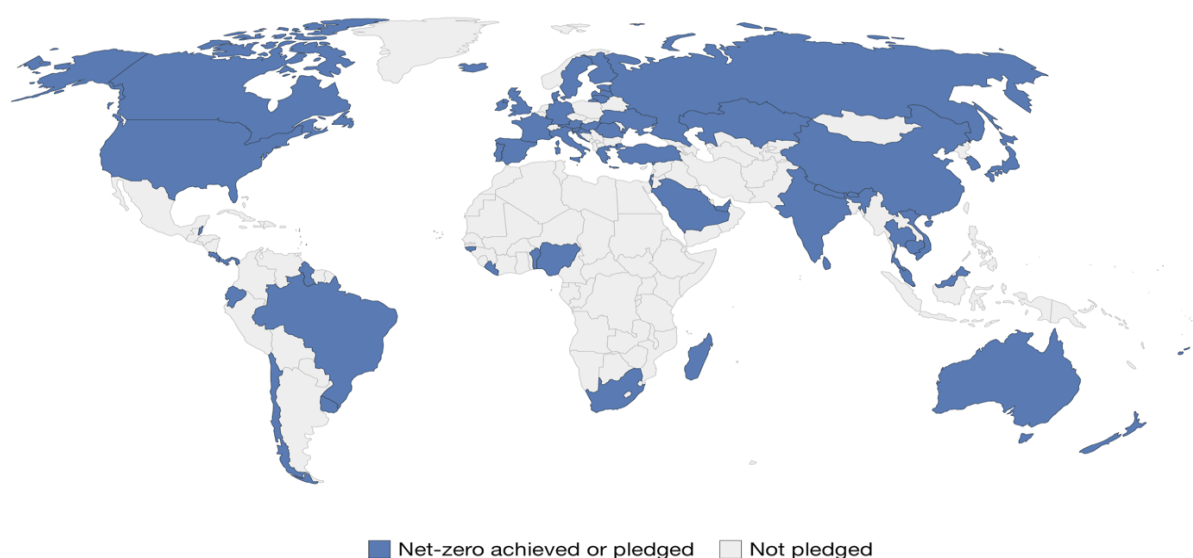
Therefore, given that coal-related emissions are the most polluting, the Glasgow conference reached important goals in the direction of coal reduction. Among them, the most relevant can be enlisted as follow (UNFCCC 2021):

- collection of over \$20 billion by both public and private institutions so as accelerating the process of transition from coal to renewable energies by developing countries. Almost a half of the total fund has been sent to Global Energy Alliance for People and Planet which will bring renewable electric energy to almost 1 billion people by 2030 and though contribute to an overall reduction of 4 billion tons
- new pledges by major coal financing countries to stop supporting the coal industry by the end of 2021.

As we can notice by looking at Figure 1.4, within the energy block an important role is played by transportation, accounting for 16.2% of the global CO<sub>2</sub> emissions, meaning that a decarbonization of the sector would take down the CO<sub>2</sub> balance account by almost 2.6

gigatons per year (UNFCCC 2021). That is why COP 26 not only achieved the commitment by part of 30% of global car market share to phase out fossil fuel cars, but also received the positive spur by General Motors, Audi, Jaguar, Fiat, Volvo at achieving 100% zero-emission vehicle by 2035 (UNFCCC 2021).

Among the major arguments, at COP 26 a relevant one consisted in making parties realize the importance of the net-zero approach, intended as the point in time where the amount of GHGs emitted equals their absorption. Hence, we can stress the importance that forests have in order to give countries a viable instrument to off-set their emissions. It is exactly in this light that the Conference achieved (UNFCCC 2021) the coverage of 90% of the global GDP by the net-zero pledge, corresponding to those countries depicted in figure 1.5 (also through set-off plans).



*Figure 1.5: Pledged vs non-pledged countries in terms of Net-Zero (Ritchie and Roser 2020)*

Finally, for the first time in decades actions toward Methane - which is accountable for 17.3% of global GHGs emissions- have been guaranteed. Particularly, a major achievement in this field has been the signature by 100 countries - corresponding to 70% of global GDP - to the Global Methane Pledge which should reduce global methane emissions by 30% by 2030 (UNFCCC 2021).

### ***1.2.2 Actions on Adaptation***

Following COP 21, we can notice the remarkable commitment by the world to understand that actions toward mitigation are not enough unless accompanied by spurs at incentivizing adaptation through new resilient ecosystems.

As remarked by the IPCC special report (Allen et al. 2018) while the average temperature has risen by about 1°C with respect to pre-industrial levels, in some specific areas of the world we have already reached much higher temperature leading up to catastrophic events for the whole ecosystem such as floods, droughts, sea rise, and biodiversity loss. Moreover, about 20-40% of the global population has already experienced in at least one season temperatures higher than 1.5°C.

However, a great deal of these areas not only is threatened by these climate problems, but it is also menaced by those social and economic problems typical of developing countries (Lovbrand et al. 2017).

Hence, in order to support those countries toward adaptation, the following milestones have been guaranteed by the Parties in November (UNFCCC 2021):

- signature of the Glasgow- Sharm-el Sheikh on the Global Goal on Adaptation so as incentivizing the sharing of pieces of information and ideas by all those countries involved
- launch of the Adaptation Research Alliance (ARA) being the first framework of this kind within which countries, organizations and businesses can commit themselves to the development of a more resilient world
- balance in terms of Climate Finance between mitigation and adaptation funds in favor of the latter, for which the European Commission- with the help of other countries - has committed to contribute for about \$12.7 billion.

### ***1.2.3 The role of Climate Finance***

As we have already anticipated within each of the previously analyzed phases, namely: mitigation and adaptation, the means through which Parties are able to take actions need to stem from the so-called Climate Finance. Taking the definition given by the UNFCCC, we can interpret Climate Finance as the act by developed countries of conducting financial efforts both in public and private field not only for mitigation, but also for adaptability purposes (Investopedia 2020).

In order to better understand the dynamics of Climate Finance, we need to characterize the financing sources, the main instruments which are utilized, and finally the areas within which investments are performed.

Research from the Climate Policy Initiative (Climate Policy Initiative 2021) shows that global climate finance investments have been increased in the last couple of years according to the surge in sustainability-related interests, and in terms of biennial average value they reached \$632 billions worldwide, as shown in Figure 1.6.

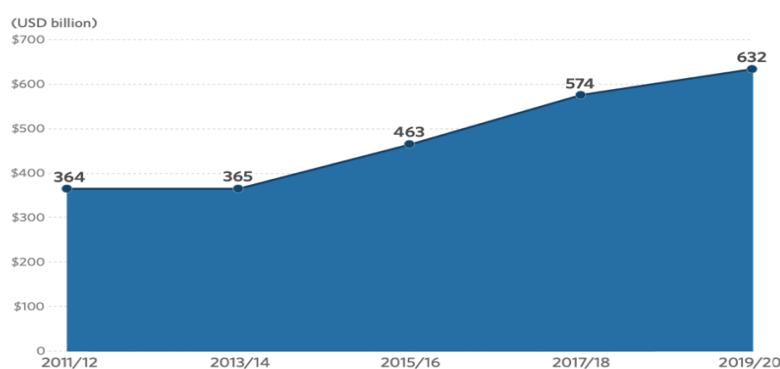


Figure 1.6: 10-year evolution in climate-related investments (Climate Policy Initiative 2021)

As we can grasp, the highest percentage increase happened in the aftermath of the Paris Agreement, though between 2015 and 2016, when the average investments in climate finance rose by about 27% with respect to the previous years. However, most recent trends show how between 2019 and 2020 the average investments reached \$632 billions worldwide.

This number of investments is basically provided by two important sources being both public and private finance. According to the most recent findings (Climate Policy Initiative 2021), while the former contributed for a total amount of \$321 billion– corresponding to more than half of the overall percentage - the latter amounted for \$ 310 billion, though we can conclude that both the sources result to be equally important as shown by the following Figure 1.7.

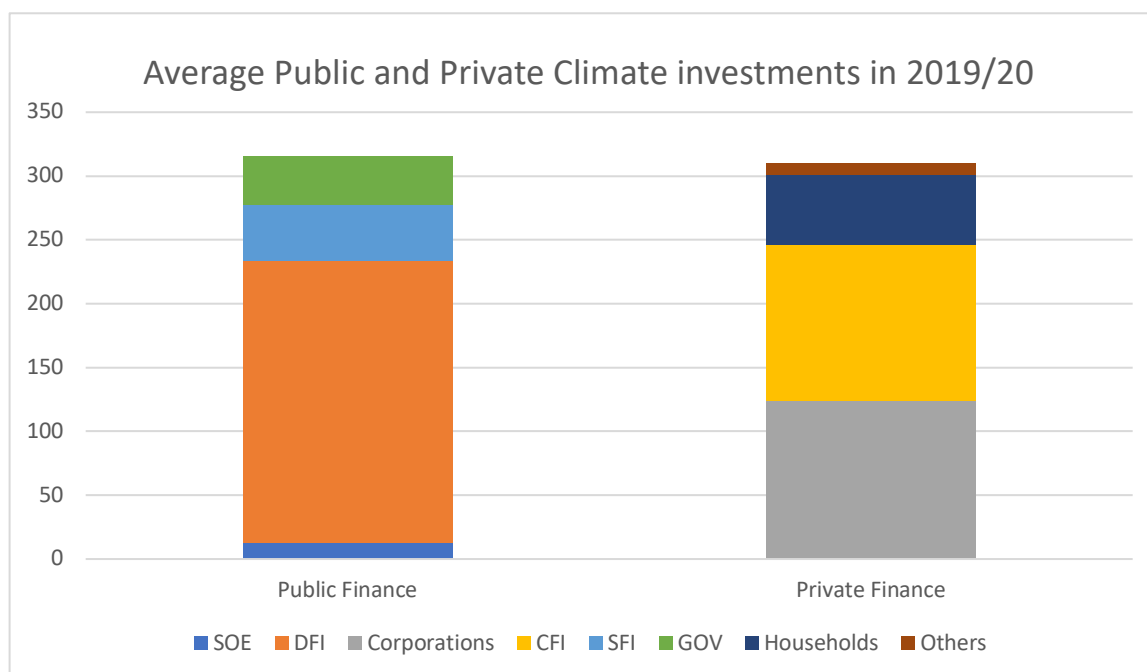


Figure 1.7: Average public and private climate investments in 2019-2020 (own elaboration, data source: Climate Policy Initiative 2021)

Among Public Finance, it is worth mentioning the following institutions providing funds to related projects:

- State-owned Enterprise (SOE) defined as a legal entity created by a government with the objective of operating commercial activities on its behalf (Investopedia 2020). On average between 2019 and 2020 they provided an amount of \$13 billion in terms of climate investments

- Development Finance Institutions (DFI) being specialized state-owned banks providing specific aid to the private sector of developing countries either through bilateral or multilateral operations (OECD 2022). According to the data we provided, they accounted for \$220 billion in terms of climate investments

- State-owned Finance Institution (SFI) is instead defined as a normal state-owned company dealing with financial and monetary transactions (Investopedia 2022). Their climate investments in 2019-2020 amounted on average for \$45 billions

- Governments (GOV) distributing instead around \$38 billions in climate-related projects.

On the other side, the three main investors coming from Private Finance are: households and individuals for \$55 billion, commercial financial institutions (CFI) counting for about 40% of the private investments, and corporations distributing instead \$124 billion.

Needless to say, the totality of these investments is created through the two paramount financial instruments of debt and equity such that together they account for almost 94% of the total climate investments in 2019-20 (Climate Policy Initiative 2021).

In absolute terms, debt-related instruments are the most widely used by both public and private finance, such that their overall contribution accounted for about \$384 billion (Climate Policy Initiative 2021). Moreover, among these instruments we might enlist both green bonds, and green loans (UNEP Inquiry 2016) as the most widespread in the field of Climate Finance whose main aim is at guaranteeing resources into climate-related projects either in the short run as for loans or in the long term as for bonds (ICMA 2018).

Lastly, if we consider the sectors within which these investments are made, the report shows how in 2019-2020 there were still too few investments in the field of adaptation such that \$567 out of \$619 billions were directed into mitigation practices (Climate Policy Initiative 2021).

The bottom line is that although the huge commitment by both Public and Private Finance throughout the years, the perception is that more should be done in order to align financial inputs to climate goals hence, the Glasgow Conference goes exactly in that direction. This commitment brought about the following major achievements (UNFCCC 2021):

- first-time agreement among developed countries to document in a report the progress toward the 100-billion-dollars objective by 2025, according to which those investments should be provided by developed countries to developing areas every year
- spur at sustaining financial and technological investments in the adaptation sector so as building resilient countries
- all the G7 countries - exception made for Japan - committed themselves to abandoning investments in fossil fuel by the end of 2022
- private sector commitment by over 450 institutions to comply with net-zero targets within 2030 following the Glasgow Financial Alliance for Net Zero (GFANZ). More importantly, these commitments by companies do not have to end up being greenwashing, hence GFANZ will work with governments so as to strengthen regulations in that area
- given that at the pledges of the companies need then to correspond real actions, countries will operate with the International Sustainability Standards Board so that companies provide their investors with correct information in terms of investments linked to climate finance.

As a bottom line, although the paramount progress toward the sensibilization of businesses and the achievement of numerous pledges by several institutions, what emerges from the Glasgow Pact is that policy makers and governments should work to a clearer framework regulating green investments mainly from the private sector.

### 1.3 The evolution of Climate Finance into ESG

As we could observe, the concept of Climate Finance was heavily suggested by policymakers for the first time at COP 21. However, the increased importance of the argument drove the Parties to mobilize fresh resources and solicit new pledges in Glasgow. However, throughout the years Climate Finance evolved in Green Finance at first, and Sustainable Finance secondly accordingly also to the fact that investing in social fields can positively affect climate change due to spillover effects (EPRS 2021). An example may be suggested by a social fund investing in responsible food production which in turn affects climate-related problems.

As shown in Figure 1.8, while Climate Finance is basically concerned about climate change mitigation and adaptation actions (Investopedia 2020), the broader focus of Green Finance also embraces other environmental issues such as biodiversity protection (UNEP Inquiry, 2016).

Conversely, Sustainable Finance – which paves the way to ESG (Environmental, Social, Governance) - can be seen as a further progression of Green Finance given that its interest not only is linked to environmental practices as the ones we mentioned beforehand, but also to both Social, Economic, and Governmental aspects (UNEP Inquiry 2016). In specific terms, while the social nature concerns more issues related to working conditions, health, and safety, both economic and governmental aspects are concerned with arguments such as: monitoring unemployment, evaluating supply chains, paying attention to executives' pay, and guaranteeing a fair board structure within a company (UNEP Inquiry 2016).

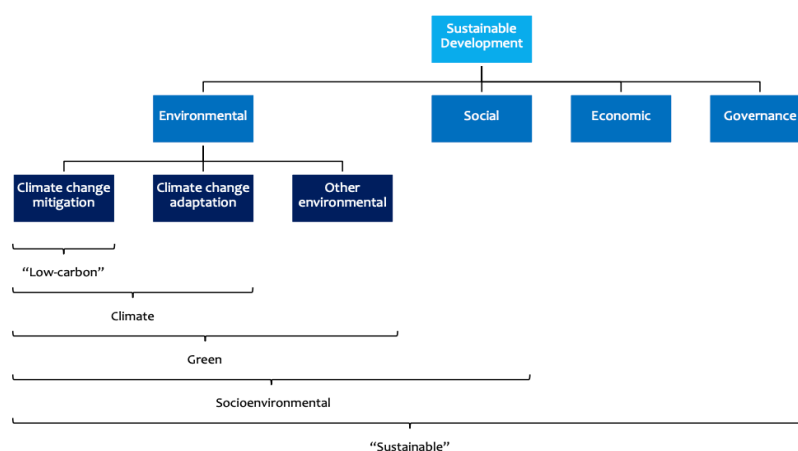


Figure 1.8: Breakdown structure of Sustainable Finance (UNEP Inquiry 2016)



As remarked while diving into the concepts of Climate Finance, we observed how the most used tool allowing the global finance to group resources is debt (Climate Policy Initiative 2021).

In particular, on top of the aforementioned tools – being both green bonds and loans – due to the recent expansion of Climate into both Green Finance and ESG, it is worth mentioning other debt-related instruments on which debtholders are keen on investing.

As suggested by Bloomberg (Bloomberg 2020), the increased interest in the sustainability field by part of investors is crystal clear if we look at data. In particular, what they underline is that while in the aftermath of Paris Agreement sustainable debt instruments almost doubled with respect to 2015 reaching more than \$100 billion, and about \$465 billion in 2019 (Bloomberg 2020).

As shown by Figure 1.9, not only across time we had an increase in the number of sustainable funds, but what is also clear is the enlarged variability of debt instruments. As a matter of fact, while in 2015 we had a quite complete dominance of green bonds, as of now many other instruments have become available. Hence, we can enlist the most relevant ones, as follow:

- Sustainability bonds, being thought for both green and social projects and having the objective of co-benefits, in the sense that if a bond is designed for social purposes, then through some spillover effects it may also affect the environmental path (ICMA 2018). This instrument received loads of consideration in 2019 so that accounted for \$46 billion of the overall sustainable market debt (Bloomberg 2020)
- Social bonds, gathering resources used for social projects such as a project related to the alleviation of outcomes flowing from unemployment within a community, or also the improvement of a health care system in the aftermath of a pandemic (ICMA 2020)
- Sustainability-linked bonds and loans being instead instruments whose interest rate can vary according to the performance indicators of ESG. In particular, the closer to the ESG objectives, the lower the interest rate (Loan Market Association 2019). With particular reference to loans, we can observe how in 2019 they were worth more than \$100 billion, roughly 25% of the overall sustainable market debt (Bloomberg 2020).

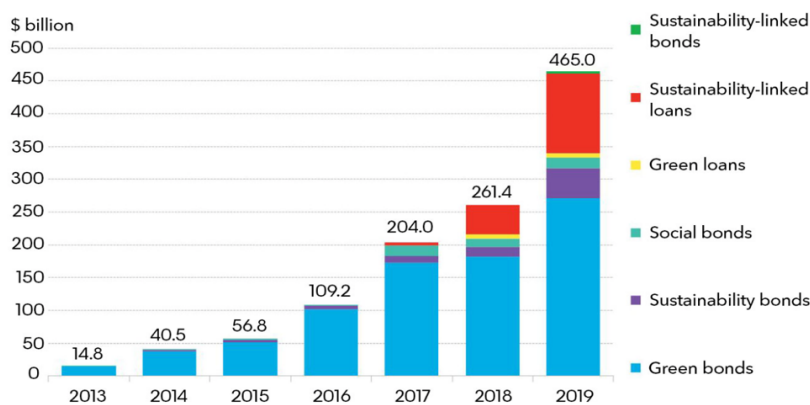


Figure 1.9: Sustainable market debt by year and instrument across 2013-19 timespan (Bloomberg 2020)

Despite this increased consciousness by part of investors not only in subjects related to environmental sustainability, but also in issues concerning society and governance, we need to highlight that little has been done by governments and financial institutions in order to implement both a correct taxonomy of sustainable finance, and a precise standardization of what sustainable products and instruments are. Therefore, there is an urgent need to find best practices so as to split what is a pure green label from what is truly green and sustainable: putting it different, methods to detect greenwashing are needed. This is an overarching issue which needs a quick response by authorities and decisionmakers since a failure to do so would lead up to a loss of confidence by part of investors, debtholders, and customers and consequently a lower commitment in green and sustainable-related investments and actions. Therefore, in the next chapters we will dive not only into the phenomenon of greenwashing, but also into some standardized methods which could help in separating greenwashing from sustainability practices. Finally, we will give a glimpse to the options both policymakers and companies have to better deal with corporate and social responsibilities.



## **Chapter 2: Greenwashing and main drivers**

### **2.1 What is Greenwashing?**

As we remarked in Chapter 1, the relevance of sustainability has been progressively increasing across the years.

On one hand, companies seem to be continuously more engaged with the issues linked to climate change as shown by their continuous support in terms of pledges concerning Mitigation and Adaptation, and more in general to their Corporate Social Responsibility or CSR.

On the other hand, both investors and customers seem to be steadfastly fascinated by the subject: while the former show to be plugging their financial resources into Sustainable Finance, the latter are now literally keen on green markets for both products and services. Finally, also Governments have progressively risen their support to climate actions both through Public Climate Finance and specific regulations, even though with respect to the latter argument much needs still to be done in order to objectively define what can be labeled as sustainable and what cannot be.

It is mainly in this scenario - which is essentially dominated by both high-level keenness from investors and costumers toward the subject, and uncertain regulation - that greenwashing practices have been arising and bringing about major negative consequences such as: diminishing costumers' confidence toward green markets (Furrow 2009) and decreasing investors' involvement into sustainable investments such as ESG funds (Delmas & Burbano 2011). In particular, if we consider the latter, a recent survey from Statista (2021) shows that for institutional investors the largest barrier to sustainable investments during 2020 and 2021 has been greenwashing.

More in detail, whenever we refer to the concept of greenwashing, we need to admit two levels at which it happens, namely: the product-service level being more intertwined with the marketing dimension and the firm-level concerning instead company's corporate strategy (Delmas & Burbano 2011).

While the so-called product and service-level greenwashing has the objective to deceive customers into the environmental benefits of a specific product or service, the firm-level greenwashing is linked to the tendency to mislead stakeholders about the environmental

practices carried out by the company, though it puts more attention to its corporate practices (Delmas & Burbano 2011).

According to the most recent Agenda 2030 approved in 2015 by Governments of the United Nation Member States, its 17 Sustainable Development Goals not only are devoted toward environmental but also social sustainability (United Nation General Assembly 2015), hence it makes sense to refer to the term greenwashing not only in relation to climate issues, but also enlarge the context to the more general issues linked to sustainability as also suggested by Lyon & Maxwell (2011).

We shall now start defining and analyzing both the levels at which greenwashing takes place.

## 2.2 Product or Service-level Greenwashing

Product or service-related greenwashing can be seen as a phenomenon majorly intertwined with customers, and obviously to the way in which companies react to the surging market demand in sustainable products or services.

In order to better understand this scenario, our analysis needs to start from the drivers leading up to a surge in the customers' demand of green products, and how firms react to it.

If we look at the demand side, we can observe how the increased interest in green-related subjects is consistent with a higher willingness-to pay for green products rather than non-green ones - also known as brown - by part of customers (OECD 2002). To this purpose, very recent research published by The Economist (EIU 2021) illustrates how between 2016 and 2020 googling greener products became more popular so as to switch from about 20% to the most recent 70% globally. Moreover, as depicted by Figure 2.1, we can observe that this global awareness is equally important in every corner of the globe, such as Germany, Australia, and the UK.

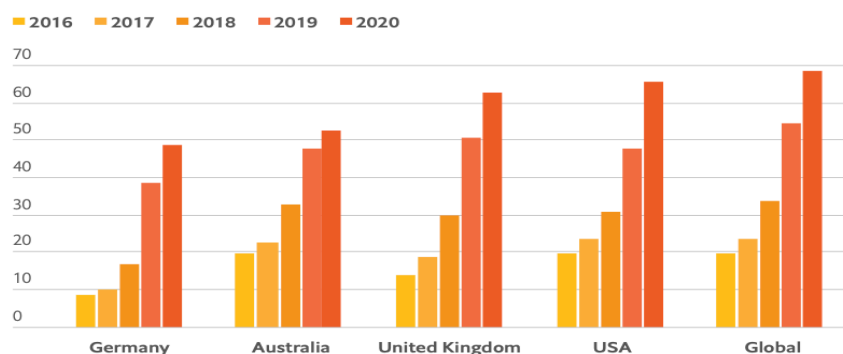


Figure 2.1 – Customers interest for green products between 2016 and 2020 worldwide (EIU 2021)

According to microeconomics, increased willingness-to pay – which can be translated in a higher marginal utility generated by green rather than a brown product – can be seen as the main leading cause to an increased demand toward this array of products (Brècard et al. 2009). However, the aforementioned cause is not the only one within this scenario since we also need to consider both intrinsic motivations (Frey & Stutzer 2006) and constraints (Mahenc 2008).

Among the different intrinsic motivations leading up to a greener customer choice, Frey and Stutzer (2006) mention several psychological factors among which it is worth highlighting the importance of internalized norms, being those rules subjectively made and arbitrarily imposed by customers to themselves.

On the other hand, Mahenc (2008) specifies that the two major constraints customers need to respect are both income and information about the product's sustainability-related aspects. With respect to the former, we can observe how people highly attracted by green products but at the same time limited by their income tend to opt for the cheapest of the two, no matter whether they are brown or green. The other constraint we mentioned is linked to information quality and quantity linked to products' sustainability. It comes out that purchasers are usually poorly informed about the environmental cradle-to-grave analysis of the products, hence it could end up being more frequent for a product to be misleading.

Therefore, we can point out that it is exactly in this context where the market could play up customers in such a way that while on one hand it may endorse eco-friendly products, on the other hand firms could introduce informational anomalies so as to mislead costumers. Among these anomalies, seven pivotal details leading up to product greenwashing can be enlisted as follow (UL 2010):

- Hidden trade-off, known as the practice through which sellers show those attributes linked to sustainability with which they comply, while instead the remaining ones are barely mentioned. As example, if we consider paper, we cannot say that its usage is an environmentally sustainable choice just because its raw materials come from sustainable-harvested forests. In fact, many more factors need to be considered within the production of such an element, namely: electric energy usage, manufacturing methods, packaging, etc.

- No proof, for which by considering the poor level of information provided, products elaborate claims without they comply with them in an effective manner. An example could be linked to a product whose label claims high percentage of recyclability after usage without providing any evidence of it

- Vagueness, meaning that the label does not provide enough clarity. As example, it is worth mentioning when we think of statements such as “all-natural”, for which we need to know that also elements such as arsenic or uranium are natural products, but they are not necessarily eco-friendly
- Irrelevance, when unimportant statements are made, such as “substance-free”, and that specific element is forbidden by law
- Claims which are truthful for the product category but mislead the costumer since that product category is a brown one. An example might be linked to fuel-efficient sport-vehicles or also to organic cigarettes
- Fibbing, meaning that advertisement fibs and are expression of a lie as in the case of a product which is announced to be certified but instead it is not effectively
- False labeling, when a product is basically endorsed as if it was proposed by third parties’ organizations, without being the case.

The analysis conducted by UL (2010) reported that roughly 95% of over 5,000 products sold as green in Canada and US, used to commit at least one of the previously enlisted anomalies. Among them, the research shows that the most widespread are both No-proof and Vagueness.

## **2.3 Firm-level Greenwashing**

So far, we have been dealing with product or service level greenwashing that - as we have already specified is meaningfully intertwined with concepts such as advertisements and marketing.

Now we shall dive into the firm-level greenwashing which finds its natural conjugation within the field of corporate strategy. From a practical standpoint, if we want to better define green washers, we can think of an enterprise both in terms of Environmental Performance on one hand, and Communication about Environmental Performance on the other (Delmas & Burbano), as shown in Figure 2.2. Therefore, a company can either have a good Environmental Performance within its operations and being denominated as ‘green’, or it can carry out activities which are not in line with high-level environmental standards, and for that being labeled as ‘brown’. With respect to the communication level instead, we might either have firms communicating in a positive way taking the name of ‘vocal’, or firms deciding not to communicate known as ‘silent’.

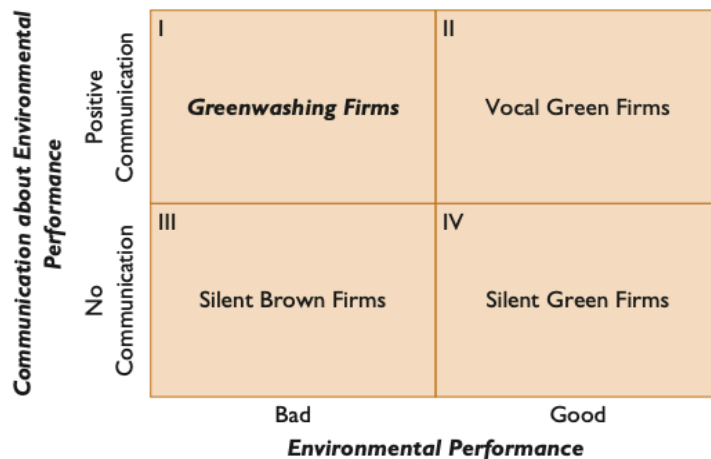


Figure 2.2: Firms' classification by environmental level of communication and performance (Delmas and Burbano 2011)

As it is displayed - through the criteria we mentioned - four distinguished companies' behaviors can be assessed. Among companies with a tremendous environmental performance, we can separate Vocal Green Firms - which are positively endorsing their sustainable operations - and Silent Green Firms which are instead less keen on disclosing their eco-friendly approach.

Conversely, if we move to brown or poor performing companies in the field of sustainability, we can differentiate those which keep being silent – known as Silent Brown Firms - and those which, although their brown policies, present themselves as green – named Greenwashing Firms. Thus, what emerges from the observation of the matrix, is that a company becomes a green washer when pursuing either a horizontal or a vertical path. While the former can be interpreted as the switch of a vocal company from green to brown operations, the latter needs instead to be seen as the practice of a brown-operating company to put in place positive communication of its operations.

In what follows, we will dive into the main causes or drivers leading up to corporate greenwashing.

### 2.3.1 The drivers of Corporate Greenwashing

As we observed, corporate greenwashing is essentially characterized by brown operations accompanied by positive communication strategies.

According to Figure 2.3, the main drivers of this behavior can be basically identified in two different components being both external and internal factors. While among the former we can mention influences flowing from either nonmarket-related or market-related drivers, if



we mention the latter main factors could be linked to the organization (Delmas & Burbano 2011).

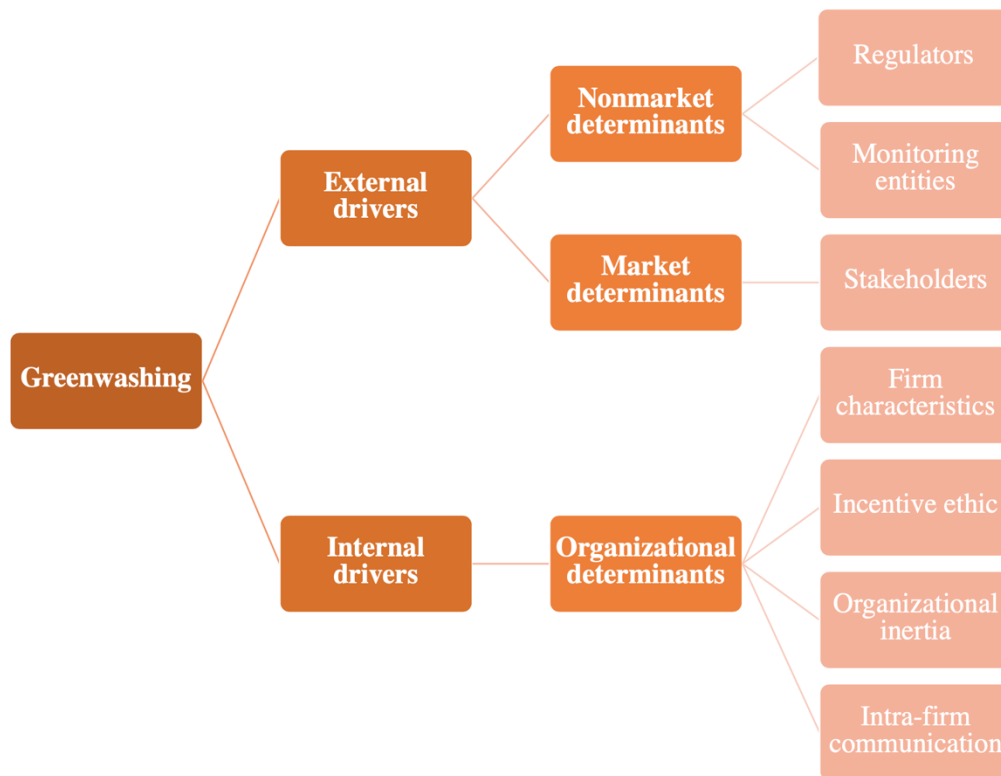


Figure 2.3- The drivers of greenwashing (Delmas & Burbano 2011, own elaboration)

### 2.3.1.1 External drivers

Among the external drivers, we can mention both nonmarket and market forces.

On one side, if we take into account nonmarket forces, then it is basically worth mentioning the crucial role played by both regulators - such as governments - and monitoring entities interested in monitoring sustainability-related performance - such as NGOs and activists in general.

One of the more powerful drivers of greenwashing entails poor and weak regulation of green and sustainable practices at a global scale (Delmas & Burbano 2011).

In particular, what emerges is essentially that rules defining what can be considered as green and what cannot be, are essentially entrenched in single areas or regions and are not uniformed at a global scale (Delmas & Burbano 2011). An example of this regional and

partial behavior by regulators flows from the European Union, that in June 2020 (EPRS 2021) introduced the EU Taxonomy Regulation with the goal of unifying concepts linked to Sustainable Finance within the Euro-area. In other cases, we may bump into situations where the jurisdictions emphasizing and promoting self-declaration and voluntary (Delmas & Burbano 2011) as it happened with the introduction of ISO 14021 regulating these self-made environmental claims. However - despite these efforts - much has still need to be done in order to ensure a fair behavior by brown companies (Delmas & Burbano 2011), and it has also been demonstrated by EU's intention of achieving standardization and transparency in this sector through the issuance of a new EU-US agenda for global change (EPRS 2021).

The very last nonmarket force driving corporate greenwashing can be interpreted as a consequence of weak regulation and is indeed identified in the figure of monitoring entities such as NGOs and activists who – relying on powerful tools such as social media – are able to provide customers and investors with the pieces of information they need in order to have a correct interpretation of a given company in the sustainable field (Delmas & Burbano 2011). In spite of this fact, we need to admit that these entities cannot be interpreted as absolute solvers of this mismanaged situation given that their contribution may be limited to creating a sort of reputational damage to greenwashing companies (Delmas & Burbano 2011) that in the meantime feel confident enough about the fact that they will not be held accountable for any of their pledges (Nemes et al. 2022).

On the other side - among external drivers of greenwashing – we need to collocate market determinants, whose main actors are stakeholders such as: customers, investors, and competitors (Delmas & Burbano 2011). Therefore, if we consider both customers and investors, we can emphasize the tendency by brown companies to increase positive environmental performance and though greenwashing operations whenever customers and investors increase their demand for sustainable contents (Vos 2009) due to the fact that while for the former verifying the quality of a product would be challenging, for the latter the same can be remarked (Delmas & Blass 2010). With regard to competitors instead, we need to underline that if within a market some firms model themselves in such a way that is successfully and valuably perceived by stakeholders, then also the remaining firms will follow the exact same trend (Delmas & Toffel 2008).

### ***2.3.1.2 Internal drivers***

The next aspect we shall consider is intertwined with internal drivers, whose main objective is to shape how greenwashing companies react to the external solicitations we mentioned earlier (Delmas & Burbano 2011). As depicted by Figure 2.3, internal drivers can be substantially triggered by organizational determinants.

Therefore, at the organizational level we need to take into account features such as: firm characteristics, incentive structure, organizational inertia, and intra-firm communication.

The pivotal firm characteristics having an impact as drivers of greenwashing are both size of the company and business typology (Delmas & Burbano 2011). If we consider the size, Delmas and Burbano (2011) established that the larger the company the more the benefits attributable to the choice of greenwashing due to the attention triggered to investors. However, at the same time major companies are the most targeted one in terms of regulations and activists' reactions. The same authors explain that - with respect to the business typology - firms manufacturing products rather than proposing services are the ones perceiving huger benefits by being vocal and brown. However - as in the case of large companies - we need to remark that those are the ones more subjected to public scrutiny by both governments and NGOs.

Concerning the incentive structure instead, managers' incentives within a company generally influence managers' behavior. In other words, an unethical behavior such as greenwashing could take place if companies foresaw a huge compensation package for its managers when they achieve a given level of green communication (Delmas & Burbano 2011).

Another crucial aspect which likely leads up to this companies' unethical behavior (Maxwell et al. 1997) flows from the concept of organizational inertia, which can be described as the phenomenon for which an organization finds it difficult to modify and adapt its own resources and routines to new needs and stimulus from the external environment (Cantamessa & Montagna 2016). Therefore, in a continuously changing environment – such as the sustainable one - it will be even more likely that decision-making processes will be affected by this sort of inertia (Rumelt 1995). In particular, since switching from a brown production to a green one can be considered as an important and difficult to achieve change within the boundaries of an enterprise, it can happen that while at the corporate level top-management may agree upon switching to a more sustainable business model, on the other

side this change may be perceived as challenging to be put in place effectively, and as such create greenwashing (Maxwell et al. 1997).

Ultimately, as shown by Allen (1984), the more the interactions between departments, the more successful an innovation project will be, hence intra-firm communication is essential. Therefore, if we consider the transaction toward a greener production as an innovative project, the failure in doing so may be evidently connected with a lack of proper communication among the different departments (Delmas & Burbano 2011).



## **Chapter 3: Measuring Greenwashing**

### **3.1 The need of a measurement**

Up to now not only we stressed out the importance of Climate Change, the need for action, and the surging interest for Sustainable Finance (Chapter 1), but we also touched upon a very relevant problem known as Greenwashing (Chapter 2) both at the product or service level and at the firm level.

If one picks the former issue, they might adopt techniques such as Life-Cycle Assessment (LCA), Streamlined LCA, and Eco-Auditing so as to measure the sustainability of a given product or service over its lifetime. In particular, while the very first two methods result to be more qualitative (Guinée et al. 2002), the latter allows to measure in practice both the MJ of embodied energy needed, and the Kg of equivalent CO<sub>2</sub> emissions at each phase of the product or service lifecycle (Ashby 2012).

On the other side, if one dives into the issue of greenwashing at corporate level, they will surely discover that the analysis which needs to be carried out is indeed much more complex with respect to the former case, in fact here the boundaries of the analysis are extended to the company as a whole. Specifically, although the interest prompted by Sustainable Finance and ESG has been increasing over the last years, the problem of finding out a way for measuring greenwashing and detecting which company really follows ESG practices and which does not is still hard to determine (Financial Times 2022).

Therefore, we will now propose three different measurements which are utilized in the industry in order to find out whether a corporation complies with sustainable principles, or it is just a case of corporate greenwashing. In particular, in the following three subchapters we will focus on the introduction of ESG Risk Ratings, ESG commitment level, and Corporate Climate Responsibility Monitor.

### **3.2 The ESG Risk Ratings measure by Sustainalytics**

#### ***3.2.1. Introduction to the ESG Risk Ratings measure***

In 2018, Sustainalytics - which is an independent firm specialized on ESG ratings - introduced the ESG Risk Ratings measure being an indicator that accounts for the

unmanaged risks of a company with respect to a bundle of ESG issues considered as material to the company, meaning that - if mismanaged - they might affect the long-term financial performance of the firm itself (Sustainalytics 2018).

In particular - if one wants to be more rigorous in order to ultimately depict the reason why we introduce the concept of risk– they could point out that - given the current landscape characterized by a direct involvement of businesses within the field of sustainable investments – those companies experiencing high-level ESG-related problems in the present might go through a diminishing discounted cash flow over time, thus this condition might have a direct influence on the ultimate value of the company. More in practical terms, we can point out that ESG issues lead up to either a lower level of future cash flow generated by the company, or an increased weighted average cost of capital (WACC), hence in both cases we would notice a lower discounted cash flow (Sustainalytics 2018).

What one takes in is essentially that when considering this indicator, the higher the value a company scores, the greater its unmanaged risk, the major the probability of having long-term financial repercussions on its enterprise value.

Notice that through this work, Sustainalytics has been able to produce a unique index which is comparable across industries, hence we can compare the sustainable performance of several companies independently of whether they belong to the same industrial area (Sustainalytics 2018).

More in depth, we can point out that this comparison can be done by taking into account the five different risk categories we can identify on the basis of the final result, and ranging from negligible – meaning that the ESG material risk is such that it is likely not to affect the long-term performance of our company – all the way to severe – when instead the risk flowing from ESG issues is likely to have a considerable impact on the future enterprise value of the company (Sustainalytics 2018).

In order to fully understand the meaning of this indicator, we will follow a step-by-step approach as suggested by figure 3.1.

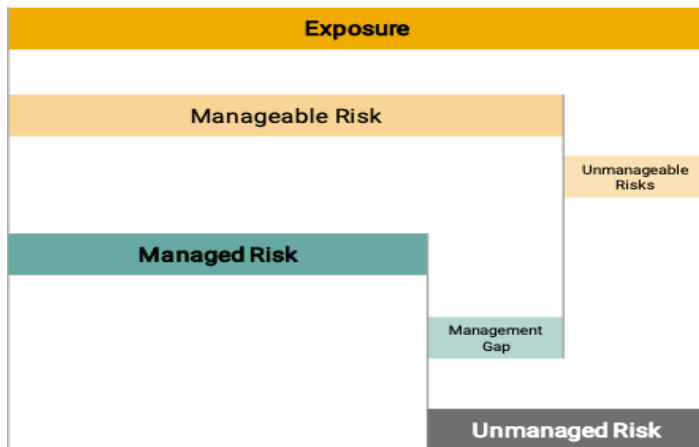


Figure 3.1- ESG risk ratings measure break down (Sustainalytics 2018)

As shown, total risk exposure of the company can be thought as compounded by both unmanageable and manageable risk, with the latter being furtherly decomposable into managed risk and management gap - being the part of manageable risk which is not controlled by the company.

According to the definition we gave, our indicator measures the unmanaged risk to the company, hence from the exposure we need to subtract the portion of risk being effectively managed by the company in order to come up with the final result.

We will now go in depth into each of the different concept we introduced in order to break down our components.

### 3.2.2 Company exposure

In order to calculate the company exposure - which has to be intended as the ESG risks that is considered to be material to the firm – we basically need to be aware of the fact that this indicator has to be firstly calculated for the company with respect to each single material ESG issue (MEI) (Sustainalytics 2018). However, before going into the procedural part, it is worth underlining that the ESG issues we will consider are related to twenty different subjects and – although they are not exactly the same – they are alike the goals of the agenda 2030 (i.e., access to basic services, human rights, etc.) (UN 2015). We can enlist each of our twenty different issues we analyze and split them according to whether they belong to the environmental, social, or governance-related branch as follow (Sustainalytics 2018):



-Environmental issues, which are namely: carbon-own operations, carbon-products and services, emissions and waste, land use and biodiversity, resilience, resource use, resource use- supply chain

-Social issues such as: access to basic services, human capital, human rights, human rights-supply chain, community relations, data privacy and security

-Governance-related issues such as: bribery and corruption, product governance, occupational health and safety

-Transversal issues, that instead cover two or more issues such as business ethics, environmental and social impact of products and services, and ESG integration – financials.

Now we will observe the following three steps in order to compute the company exposure (Sustainalytics 2018):

-Step 1: Subindustry exposure assessment, being the industry exposure to that specific ESG issue

-Step 2: Beta assessment, with respect to which we are able to determine the company exposure with respect to that given material ESG issue

-Step 3: Calculation of the final company exposure score with respect to the whole bunch of material ESG issues.

In the very first step, one needs to embark on when calculating company exposure concerns the computation of the issue exposure with respect to the selected subindustry (i.e., the issue Business Ethics related to the Oil & Gas subindustry). In particular, the range of values goes from 0 to 10, with 0 indicating that the selected issue with respect to the given subindustry is not material, and 10 indicating the opposite. Thus, in order to come up with a reliable value, Sustainalytics generally collects quantitative data of the specific subindustry with respect to the analyzed issue such as incidents track record, GHG emissions, and water consumption. Finally, after this quantitative analysis they gather both third-party researchers and industry professionals in order to elaborate a final evaluation.

In the second step, they basically calculate a company-specific multiplier known as beta, whose main goal is to take the issue exposure calculated at the subindustry level to the company level. In order to come up with this beta, the four important components we need to consider are:

-Product beta, which underlines the differences among companies belonging to the same subindustry

-Financial beta, that points out the financial differences among the different companies

-Events beta, whose main aim is at discriminating companies based on the events they need to undergo all throughout their operations

-Geographic beta, with respect to which the geographical influence on the companies emerges.

Once each of the four different betas has been determined, we need to finally calculate a unique beta of that given company with respect to that issue by aggregating the results. In particular, if the final beta is null, then it means that for that firm the issue is not material, while instead if we compute a beta of 1.2, we will have an ESG issue needs for that company being 20% more relevant with respect to the subindustry average.

Finally, the third and last step worth mentioning consists in calculating the company specific exposure to an ESG issue by multiplying its subindustry exposure by the related beta.

For example, suppose that out of the twenty ESG issues the method points out, we select Carbon – Products and services, which basically explains the GHG emissions of the products manufactured by the company all throughout the use-phase. Suppose then, we decide to consider the car manufacturing subindustry, whose exposure to that issue has been calculated as 8 out of 10 due to the fact that this industry is among the greatest emitters. Suppose now that out of the several companies belonging to that subindustry, we consider Company X whose beta is 1.5, meaning that its exposure to the issue we are analyzing is 50% greater than the subindustry average, hence we can calculate the company exposure to that ESG issue by multiplying the two results so as to obtain 12 (where calculations are  $1.5 * 8 = 12$ ).

### ***3.2.3. Manageable and Unmanageable risks***

Once we computed the company exposure with respect to a given ESG issue, we need to understand the portion of that risk being manageable by the company and the remaining portion which is considered to be unmanageable to the whole subindustry due to the particular nature of its product or service.

Generally, the underlining assumption we need to make so as to proceed is that these two portions of risk are exactly the same for the whole array of companies within their subindustry, hence we can introduce the so-called manageable risk factor (MRF) ranging from 30% to 100% and indicating the portion of risk that a company in that specific subindustry is able to manage (Sustainalytics 2018).

For example, if we consider the airline sector and the issues labeled as Carbon – Own operations (being the CO<sub>2</sub> emissions from the fact that planes fly), the MRF we can attribute to each of the companies in that sector is 40%, meaning that just that percentage amount of risk can be controlled by companies while instead the remaining cannot be dominated due to the natural shape of that industry.

In this way, after the calculation of the company exposure and the determination of the manageable risk factor (MRF) at the subindustry level, we can finally compute the portion of manageable risk by multiplying these two values, hence the remaining portion of risk will be classified as unmanageable.

For example, if we keep considering the example we made in the previous paragraph and suppose that the car manufacturing subindustry with respect to the issue Carbon - products and services has a MRF of 90%, then the portion of risk being manageable is 10.8 (where calculations are  $12 \times 90\% = 10.8$ ) and the portion of risk remaining unmanageable to the company is 1.2 (namely,  $12 - 10.8 = 1.2$ ).

### ***3.2.4 Managed risk and Management gap***

By considering the portion of risk being manageable to the company, we can then make another distinction into managed risk and unmanaged risk which is also labeled as management gap.

When accomplishing this step, we need to estimate the management score which is expressed in percentage and embodies the company's ability to manage its manageable risk, hence while 0% indicates that there is no evidence of management of the issue, when the value is 100% the company is able to manage it.

In order to come up with the management score of a company with respect to a given ESG issue, we need to consider two subsets of indicators.

In particular, while on one side the first subset is known as preparedness subset since it measures the capability of the company to be ready to face off that issue, on the other side the second subset takes into account the outcomes of a given commitment, hence in this case reference indicators might be for instance the amount of CO<sub>2</sub> reduction.

If we take again the previous example, and we suppose that for the issue in analysis our Company X is such that its management score is 75%, then we can calculate the managed risk as the product between the manageable risk (which is 10.8) and the management score

(which is 75% in this case), though we end up having a managed risk of 8.1 (  $10.8 * 75\% = 8.1$ ). On the other side, the management gap will be the difference between the manageable and the managed risks, though 2.7 (namely,  $10.8 - 8.1 = 2.7$ ).

### 3.2.5 Final calculation of ESG risk ratings

The next and final step to undertake concerns the calculation of the overall unmanaged risk of the company with respect to a given issue being the sum of unmanageable risk and management gap.

Hence, according to the example we have been following so far and schematized in figure 3.2, we can say that in this case the unmanaged risk equals 3.9 due to the fact that the unmanageable risk is 1.2 and the management gap is 2.7 (namely,  $1.2 + 2.7 = 3.9$ ). Alternatively, we can calculate the unmanaged risk by computing the difference between the company exposure (being 12 in this case) and the managed risk (amounting to 8.1).

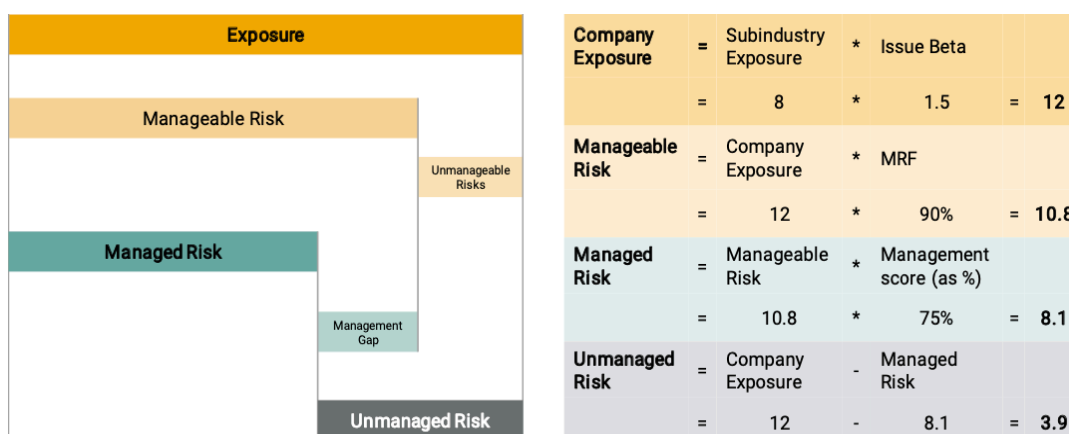


Figure 3.2 – Example of final calculation of ESG risk ratings for a company in the car manufacturing sector (Sustainalytics 2018)

Notice however that the procedure we followed is just related to a single ESG issue, while instead the final ESG risk ratings of a company concern all the possible issues, hence if we introduce the hypothesis of additivity among the issue-specific scores, then we can end up saying that our final ESG risk ratings is given by the sum of the unmanaged risks computed for the company for each of our issues, as shown in the equation 3.1, where  $i$  represents each of the twenty different scrutinized ESG issues.

$$ESG \text{ risk ratings} = \sum_{i=1}^{20} ESG \text{ risk ratings } (i)$$

Equation 3.1 – ESG risk ratings (Sustainalytics 2018)

Once we calculate the final ESG risk ratings for a company, the overall result can be interpreted in one of the five different risk categories one can individuate according to figure 3.3.

Company Score	ESG Risk Level
0-9.99	Negligible
10-19.99	Low
20-29.99	Medium
30-39.99	High
40+	Severe

*Figure 3.3- Sustainalytics ESG risk ratings distributed across different scores (Morningstar 2019)*

As we can observe from the schema, we need to mention:

- Negligible risk corresponding to a final value between 0 and 9.99
- Low risk corresponding to values between 10 and 19.99
- Medium risk accounting for values between 20 and 29.99
- High risk when the ratings are between 30 and 39.99
- Severe risk from 40 onwards.

Notice that while negligible risk means that the future enterprise value is not likely to be lowered down by ESG issues, in the case of severe risk the company's value is likely to be reduced due to the rise of ESG issues.

### ***3.2.6. Final interpretation of the ESG risk ratings***

As we have already mentioned, the indicator we proposed is mainly concerned with embodying the level of risk to which a company is subjected now with respect to those ESG material issues which might lead up to a decrease in the future enterprise value of the company.

Therefore, although on one side this indicator is not directly intended and conceived for measuring the level of greenwashing a company is exposed to, on the other side it can be pointed out that the higher the ESG risk ratings of a company, the greater will be its portion of risk being unmanaged, hence the lower the effort to take actions in order to low down this risk, and as such the more will be its exposure with respect to greenwashing practices.

However, we need to remark once again that the portion of unmanaged risk measured up by this indicator not only includes the management gap, but also the unmanageable risk, though

in order to obtain a more precise indication with respect to greenwashing, one might opt for excluding from this calculation the part of risk being unmanageable since it flows from the natural conformation of the business and not from the approach put in place by the specific company.

To sum up we can remark that if we interpreted the ESG risk ratings as a direct indicator of greenwashing, we would end up overestimating this value due to the presence of a portion of risk for which the company is not able to take actions for.

### **3.3 The Morningstar ESG commitment level**

#### ***3.3.1 Introduction to the indicator***

The Morningstar ESG commitment level is an indicator measuring the performance of a company within the field of ESG, hence its main scope is to foresee the potential future return of the actual investments taken at the company level (Morningstar 2021).

On one side, with respect to Morningstar, we can say that this is an American company providing a large array of financial analysis on investments in an independent way.

On the other side, with respect to the index, its computation is merely limited to the financial service industry and – more narrowly – to the asset management subindustry, whose main aim is at increasing total wealth over time by acquiring, maintaining and trading investments having the potential to grow (Investopedia 2022).

Notice that the calculation can be carried out both for a single strategy and for a company as a whole and its specific managerial choices, however according to the purpose of our analysis, we will focus on the second kind of measurement.

Similarly with respect to the ESG risk ratings, also in this case the ultimate value can be individuated within the boundaries of a scale, but differently from that case we have a four-tier scale which is made up of (Morningstar 2019):

- Low commitment, showing that this asset management company does not integrate ESG principles within the boundaries of its goals and values
- Basic commitment, that from a practical viewpoint basically signals the fact that the asset manager shows signals of ESG incorporation either in two different classes of assets, or in at least 25% of its overall asset class. Generally, companies belonging to this category are

either those which have recently started being interested to the incorporation of ESG principles or those whose main goal is not intertwined with corporate social responsibility

- Advanced commitment, typical of asset managers scoring between 20 and 30 and being characterized by companies having more than two asset classes covered by ESG themes and at the same time more than 50% of its overall assets

- Leader commitment, which is generally assigned to companies scoring 30 and above and being normally the ones covering with ESG practices the totality of their asset typologies and more than 75% of their total assets. Generally, this group is made of companies being which have been chasing after corporate social responsibility programs since several years, hence they are expert in the field.

Finally, in order to come up with the very final score when evaluating an asset management company, we need to weight the scores assigned to each of the following areas (Morningstar 2019):

- Philosophy and process, being the most important component in the score and weighting about 40%

- Resources, accounting for 30% of the overall score

- Active ownership, weighing about 30% of the final ESG commitment level calculated for an asset manager.

In the following paragraphs we will go through each of the previous three components.

### ***3.3.2 Philosophy and process***

According to Pearce and David (1987) - who were among the first researchers studying the concept of corporate mission of a company - one of the eight most pivotal components of corporate values is the so-called company philosophy, which is described as the foundation on top of which the firm will operate, thus when a company does believe in its corporate social responsibility, then some elements of its philosophy will unavoidably have the same objective.

While on one hand the concept of philosophy might come along the vision of the founders and top-level management, processes can be thought as the integration of the company resources and organizational routines, hence with respect to the former they are more intertwined with the practical and operational part of the company (Cantamessa et Montagna, 2016), rather than the philosophical one.

The reason why the ESG commitment level for asset managers gives 40% of its weight to philosophy and process is essentially because Morningstar not only strongly believes in the importance for a company to express out its own objectives and vision through its philosophy, but also to have the practical instruments through which it can achieve its sustainable goals.

From a more practical slant, one can observe that the final score is assigned in such a way that the following variables are taken into account when assessing Philosophy and Process (Morningstar 2021):

- History of ESG investing over time such as the company commitment to the UN principles for responsible investments among which we find the tendency to introduce ESG issues within the decision-making process
- Alignment between real investment of the company and ESG principles according to which we notice that the highest score at this level is reached by those companies whose objective is to align sustainability-related and economic goals, meaning though that they look at sustainability as an opportunity to grow in the future
- Alignment between the company philosophy and ESG principles at all levels from the top-management to the single business units and internal practices, such as the practice of hiring people whose mindset and knowledge is already aligned with respect to ESG principles and sustainability
- Firm's own ESG credentials, meaning that a company whose philosophy goes in the direction of CSR will need at the same time to integrate those principles all throughout its processes by for example introducing pay parity, career development, and carbon footprint measurement and reduction.

Finally, the overall judgement over philosophy and process is expressed according to the global scale we introduced for the ESG commitment level in low, basic, advanced and leader.

### ***3.3.3. Resources***

Whenever we refer to the resources of a company, we intend to mention the amount of people, data, and systems that need to be combined together with organizational routines in order to give rise to processes. Therefore, without the right resources, a company would not be able to put in place the right process, meaning that its goals and objectives flowing from its philosophy would be practically unfeasible.



It is exactly for this reason that 30% of the overall ESG commitment level needs to be attributed to people, data, and systems (Morningstar 2021).

With concern to the former, people educated about ESG could either be integrated within the investment team, or gathered within a different business unit, and what emerges from the data collected by Morningstar is essentially that a firm might perform adequately in both cases. On the other side, what really matters are both data and systems not only due to the many challenges lying in the data collection phase, but also due to the difficulty of well-integrating them within the boundaries of the system that analysts and managers will consult in order to take a decision about whether or not giving the green light for an investment.

From a more practical standpoint, it emerges that in assessing this important area, Morningstar pays a big deal of attention in elements such as (Morningstar 2021):

- Experience and size of ESG specialists within the organization that have a positive impact on the score assigned

- Level of coordination among investment and ESG areas for which the higher the flow of information the higher the score that will be attributed

- Type of incentive given to portfolio managers in order to include ESG performance within the decision-making process, meaning that the more the incentives are effective and lead up to a sustainability-related choice, the greater the score

- Data availability and quality, which is characterized by the fact that within the last couple of years a huge increase in ESG-related data does not make it anymore a huge issue, however what might represent a problem is the fact that the different data we are able to source are not compatible, hence it might lead up to inconsistencies. Therefore, Morningstar decided to attribute a higher score to those companies that over the years have been able to develop a proprietary framework in order to come up with its own data.

Finally, also in this case the score is assigned according to the scale made of the four following levels: low, basic, advanced, leader.

### ***3.3.4 Active Ownership***

With respect to the concept of active ownership, we basically need to stress out the fact that with the rising of ESG themes such as the Paris Agreement we discussed in Chapter 1, asset managers have commenced to assume an active role in order to exercise active control rights on those enterprises they invest. In order to exemplify, if we pick the theme of GHG

emissions, a general asset manager exercising active ownership would ask the companies under control to (Morningstar 2021):

- Implement an effective internal framework on climate change
- Act so as to reduce GHG emissions all along the value chain
- Push toward an enhanced corporate disclosure.

As in the case of resources, also active ownership counts for about 30% of the overall weight assigned to the ESG commitment level, hence in order to come up with a specific score, analysts at Morningstar focus on top of the following principles (Morningstar 2019):

- Quality of proxy voting guidelines, depending on the organization allowing shareholders to express their opinion on arguments crucial to the company
- Quality of proxy voting guidelines with respect to ESG issues, intended as the organization with respect to which shareholders are able to express their opinion on the corporate social responsibility of the firm
- Quality of engagement policy, being that strategy used by the company in order to engage more shareholders, investors and customers
- Disclosure with respect to voting decisions, which we can interpret as the capability of the company to disclose to its shareholders the final decisions
- Easiness of collaboration among shareholders and investors
- Public policy shared by the company.

As previously pointed out, also in the case of active ownership the scale according to which analysts express their judgement is a four-tier scale compounded by: low, basic, advanced and leader scores.

### ***3.3.5 Final interpretation of ESG commitment level***

Once we determined all the scores for each of the three sections and the corresponding weights to be assigned, we then need to aggregate everything into a final value embodying out ESG commitment level as shown in equation 3.2.

*ESG commitment level*

$$= 40\% * \text{Level}(\text{philosophy\&process}) + 30\% * \text{Level}(\text{resources}) \\ + 30\% * \text{Level}(\text{Active ownership})$$

*Equation 3.2 – ESG commitment level calculation for asset managers (Morningstar 2021)*

To sum up, we can essentially say that the ESG commitment level by Morningstar is an indicator of the commitment a given asset management company is able to offer within the boundaries of ESG issues. Therefore, the higher the value of this indicator, the more the analyzed company will be effectively committed to ESG policies, while instead the lower its value the more the company will be characterized by a lower commitment and higher exposure to greenwashing.

Another important piece of information that is meaningful to stress out concerns the fact that the commitment level being measured does not forecast any potential future risk or performance, as in the case of ESG risk ratings, but it simply depicts the actual level of commitment.

Notice however that this indicator can be just extended to those companies being in the asset management industry, hence it is not extendable to any other company belonging to other industries.

### **3.4 The Corporate Climate Responsibility Monitor**

#### ***3.4.1 Introduction***

In 2022, the New Climate Institute launched the Corporate Climate Responsibility Monitor (CCRM) with the core objective of separating those enterprises truly behaving as climate leaders from those following greenwashing (New Climate Institute 2022). In particular, in 2022 the Institute computed the CCRM for 25 multinational companies accountable for almost 5% of GHG global emissions.

In order to come up with a significant indicator, each company was scrutinized under four main aspects, being (New Climate Institute 2022):

- Tracking and disclosure of GHG emissions, which are intertwined with the pieces of information provided in the field of climate disclosure
- Setting emission reduction targets, being essentially linked to the type of final climate scope the company wants to pursue
- Operations aimed at reducing own emissions, which are definitely dependent on the actual performance of the company
- Climate contributions and offsetting claims, being clearly intertwined with future projects and financial aids

Not only companies were analyzed under each of the previous four aspects, but for each area they underwent a double analysis in terms of both transparency and integrity.

If the first concept is essentially well-described by the fact that our company needs to clarify its corporate strategy at all levels for its stakeholders (Berggren & Bernshteyn 2007), the second will be emphasized by the practical part, and so the degree to which the corporation is able to plug its strategy in actual operations (New Climate Institute 2022).

Notice that while during the assessment of the four different sections we use a three-tier scale made of low, moderate, and high levels, the global final assessment of both transparency and integrity for a company is expressed in a final five-tier scale encompassing both very low, low, moderate, reasonable, and high levels that are obtained by computing the average results for each of the four sections.

### ***3.4.2. Section 1: Tracking and disclosure of GHG emissions***

In Section 1, the Corporate Climate Responsibility Monitor assesses both transparency and integrity with respect to the company's ways of both tracking and disclosing its GHG emission (New Climate Institute 2022).

Notice moreover that within the boundaries of this assessment transparency and integrity are evaluated under a unique value and not two separate ones like in all the next sections as both the clarity of a strategy and its realization are exactly the same thing when it comes to tracking and disclosing pieces of information.

In particular, the evaluation is carried out according to low, moderate, and high scores.

The highest scores in this assessment are the ones reached by those companies detailing and disclosing in their reports as much information as possible among the following (New Climate Institute 2022):

- Scope 1 which covers all the direct emissions caused by the company during the process of manufacturing a product or providing a service
- Scope 2 intertwined with indirect energy-use emissions being generally caused by the product when owned by another entity
- Scope 3 which are still indirect to the company, but intertwined with all the kind of indirect emissions that do not flow from sources of energy such as upstream emissions for example business travels, employees commuting, purchased goods and services, but also downstream emissions such as franchises and investments

-Enlarging the boundaries of the accounted emissions also to the subsidiaries of the company.

Finally, according to what we have just pointed out we can remark that high scores in terms of transparency & integrity for a company in this section are guaranteed by those companies furnishing a major amount of information with a high degree of quality.

### ***3.4.3 Section 2: Setting emission reduction targets***

Whenever it comes to the second section composing the indicator, we actually evaluate separately both transparency and integrity of the emission reduction targets set by the company.

On one side, with respect to the concept of transparency, we can state that we assess the clarity of the pledges that ideally should not mislead stakeholders.

On the other side, with respect to integrity, we basically measure the depth and consistency of these pledges hence while a high integrity level is shown by the company commitment to decarbonizing its whole value chains, a lower integrity will be shown by a limited commitment.

More in the specific, while dealing with this specific section, the evaluation process needs to be split into three parts being (New Climate Institute 2022):

-Coverage of emission sources, for which a high degree of transparency is indicated by the fact that the company clearly states the scope to be achieved in that specific year, and an outstanding degree of integrity is clearly shown by the fact that the emission sources being covered by the company are as broad as possible and include not only scope 1, scope 2, and scope 3, but also relevant non-GHG emissions

-Emission reduction in the pledge for which high scores for transparency are assigned to companies committing themselves to the sole emission reduction without misleading stakeholders by introducing argumentations related to offsetting. On the other side, with respect to integrity we can point out that specific emission targets need to be in line with respect to the 1.5°C trajectory of the sector of reference, otherwise a lower score will be assigned

-Interim targets according to which an outstanding transparency level is reached when the company breaks down its long-term goals short-term intermediate ones. On the other hand,

a good level of integrity is clinched by the company when its intermediate goals are perfectly in line with the 1.5°C trajectory of the corresponding industrial sector.

#### ***3.4.4 Section 3: Operations aimed at reducing own emissions and renewable energy***

Within the third section of the indicator, we finally enter the core of the assessment, meaning that here we finally evaluate the real actions being undertaken by the company in analysis in order to put in place the targets we saw in Section 2. Specifically, these actions can be either linked to the company direct own operations, or to the energy used throughout the processes (New Climate Institute 2022).

In the former subsection, a remarkable positive evaluation in terms of transparency is achieved by those companies being able to provide the exact amount of GHG emissions reduction with respect to a given year and the specific reduction with respect to a measure that has been put in place. On the other hand, with respect to the integrity measurement we need to specify that the best practice is to implement operations allowing the company to achieve its net-zero targets, hence not only short-term projects, but also long-term ones and potential changes to products and infrastructures being classified as highly polluting.

Notice that the same criteria used when assessing transparency and integrity with respect to the company own operations can be extended to the subsection linked to renewable energy projects.

#### ***3.4.5 Section 4: Climate contributions, current and future offsetting claims***

Section 4 is more related to the actions taken by companies not only to offer some climate contributions but also to offset their GHG emissions.

While in the former case the final objective is not to counterbalance the emissions flowing from operations, but just to make different kinds of contributions such as investments in high-risk immature technologies with the aim at decarbonizing, in the latter case we need to consider those actions whose main aim is instead at offsetting those unbeaten carbon emissions generated from their operations (New Climate Institute 2022).

As we previously did, for each of the subsections we need to determine a criterion for which assessing both transparency and integrity (New Climate Institute 2022).

Within the boundaries of climate contributions, we can say that the best practice permitting the achievement of a great level of transparency is determined by those who report the financials behind their investments, the rationale behind the selection of a project, the receiver of the funds, and also the potential impact of the project. Needless to say, the lower the level of this information being provided, the lower will be the ultimate score of transparency assigned to the firm. Keeping the boundaries of this subsection, but analyzing more in detail the concept of integrity, we can finally point out that the highest scores need to be put in relation with respect to the fact that the financial contributions are used in relation to each of the three scopes (scope 1,2, and 3) but also that the company does not claim the neutralization of its own emissions.

On the other hand, within the boundaries of offsetting claims, we can assert that optimal levels of transparency emerge when the offsetting company spills out the volume of GHG emissions being offset, its discrimination with respect to each of the three different scopes, the specific project and corresponding amount of emissions offset, and the specification that the potential neutralization of emissions is not brought about by the direct reduction of emissions from operations but from specific offsetting projects. Conversely, the score assigned to integrity needs to be decided according to the contribution of offsetting projects to the overall carbon neutralization reached by the company, hence the more relevant this project is, the closer the score we assign to integrity will be high.

Finally, the third subsection is similar to the previous one but rather than considering current claims, we consider future claims in terms of offsetting plans, hence the criteria for the assessment of both transparency and integrity are quite similar to the aforementioned case.

### ***3.4.6 Final score and interpretation***

So far, we have been diving into each of the four sections composing the indicator as well as each of the nine different subsections of which these sections are made of, hence a recap of each of the different sections and subsections as well as best practices to score reach high levels of transparency and integrity are provided in figure 3.4.

1 TRACKING AND DISCLOSING EMISSIONS	COMPANIES EXHIBITING BEST PRACTICE...
COMPREHENSIVENESS OF DISCLOSURE	✓ Disclose full details on their GHG emissions on an annual basis, with a breakdown of the data to specific emission sources (including scope 1, 2, 3 and non-GHG climate forcers) and the presentation of historical data for each emission source.
2 SETTING SPECIFIC AND SUBSTANTIATED TARGETS	COMPANIES EXHIBITING BEST PRACTICE...
COVERAGE OF EMISSION SOURCES	✓ Explicitly state that their targets cover all scope 1, 2 and 3 emissions as well as any relevant non-GHG climate forcers.
EMISSION REDUCTIONS IN THE PLEDGE	✓ Set a specific emission reduction target that is independent from any offsetting, and aligned with 1.5°C compatible trajectories or benchmarks for the sector, as their main headline pledge.
INTERIM TARGETS	✓ Set interim targets that are aligned with the long-term vision in terms of depth and scope, with the first target on a timescale that requires immediate action and accountability (maximum 5 years).
3 REDUCING EMISSIONS	COMPANIES EXHIBITING BEST PRACTICE...
EMISSION REDUCTION MEASURES	✓ Implement encompassing and deep decarbonisation measures, and disclose details of those measures to support replication and the identification of new solutions.
RENEWABLE ELECTRICITY GENERATION AND PROCUREMENT	✓ Procure the highest quality renewable energy available, and disclose the full details of that procurement.
4 CLIMATE CONTRIBUTIONS AND OFFSETTING	COMPANIES EXHIBITING BEST PRACTICE...
CLIMATE CONTRIBUTIONS	✓ Provide an ambitious volume of financial support to climate change mitigation activities beyond the value chain, without claiming neutralisation of the company's own emissions
OFFSETTING CLAIMS TODAY	✓ Avoid misleading claims, and procure only high-quality credits that lead to an additional climate impact that is permanent and accurately quantified.
OFFSETTING CLAIMS TODAY	✓ Avoid misleading pledges; commit to procuring only high-quality credits from high-hanging fruit projects, and ensure corresponding adjustments are applied to limit double counting risks.

Figure 3.4- Sections, subsections, and best-practices of the Climate Report Monitor (New Climate Institute 2022)

As previously described, we have been going through the methods needed in order to assess both transparency and integrity of the subsections on a three-tier scale. The very final step we need to run is to condensate each of the scores reached by the company at each sublevel within a unique score by calculating the average and transporting it on a five-tier scale made of the following levels: very low, low, moderate, reasonable, and high for both transparency and integrity.

Therefore, the final interpretation we need to make of this indicator is that the higher the score reached by a company in each of the previous two assessment criteria, the more the company is committed to climate change, whereas in the opposite scenario the company will be more exposed to greenwashing practices.



### 3.5 Final interpretation of the indexes

Before diving into the topic of the final interpretation we should give to the bunch of measurements we have just introduced, we will quickly go through each of them by showing not only the context within which these measures were launched, but also their real outcomes in terms of measurements.

If we start with the ESG risk ratings that have been introduced by Sustainalytics in July 2018, we can basically point out how the very first analysis that was published that year was mainly focused on 4375 different issuers belonging to 42 different industries and several subindustries. More in detail, we can outline that – according to figure 3.5 - the vast majority of companies that underwent that analysis ended up with the “medium” label, while instead 1.2% of them was correct enough to reach a negligible risk (Sustainalytics 2018).

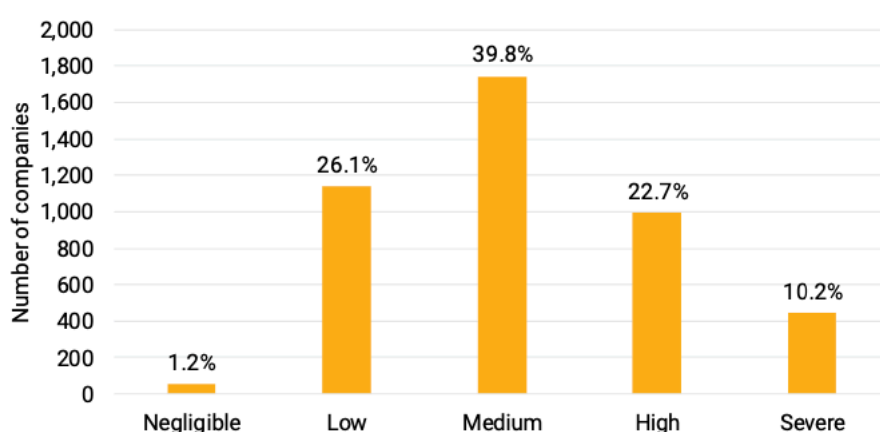


Figure 3.5- ESG risk ratings score distribution across companies (Sustainalytics 2018)

On the other side, if we give a glimpse at the second measure we introduced, namely the ESG commitment level that was introduced by Morningstar in 2020, we can relate to two different measurements: while the former was carried out in November 2020 and focused on 40 different asset managers, the most recent one was rolled out in May 2021 and characterized 31 asset managers. What it came out of those analyses was essentially that while in the former 15% of the firms got labeled as leaders, in the latter test just 3% of them was able to reach the highest score in terms of ESG commitment (Morningstar 2021).

Finally, with respect to the latter measure we enlisted, we need to know that the New Climate Institute introduced it at the beginning of 2022, hence with its launch the 25 companies recording the highest number of sales in 2020 and accounting for 5% of global greenhouse gas emissions were analyzed as depicted in figure 3.6.

HIGH INTEGRITY	PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
No companies achieved a high integrity rating				
REASONABLE INTEGRITY	PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
MAERSK	Net-zero by 2040			p. 86
MODERATE INTEGRITY	PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
APPLE	Carbon neutral by 2030			p. 56
SONY	Zero emissions by 2050			p. 95
VODAFONE	Net-zero by 2040			p. 102
LOW INTEGRITY	PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
AMAZON	Net-zero carbon by 2040			p. 54
DEUTSCHE TELEKOM	Net-zero by 2040			p. 68
ENEL	Net-zero by 2050			p. 70
GLAXOSMITHKLINE	Net-zero by 2030			p. 74
GOOGLE	Carbon-free 2030			p. 76
HITACHI	Carbon neutral by 2050			p. 79
IKEA	Climate positive by 2030			p. 81
VOLKSWAGEN	Carbon neutral by 2050			p. 105
WALMART	Net-zero by 2040			p. 107
VALE	Carbon neutral by 2050			p. 100
VERY LOW INTEGRITY	PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
ACCENTURE	Net-zero by 2025			p. 52
BMW GROUP	Carbon neutral by 2050			p. 59
CARREFOUR	Carbon neutral by 2040			p. 61
CVS HEALTH	Net-zero by 2050			p. 63
DEUTSCHE POST DHL	Zero / net-zero by 2050			p. 65
E.ON SE	Carbon neutral by 2040			p. 72
JBS	Net-zero by 2040			p. 84
NESTLE	Net-zero by 2050			p. 88
NOVARTIS	Carbon neutral by 2030			p. 91
SAINT-GOBAIN	Net-zero carbon by 2050			p. 93
UNILEVER	Net-zero by 2030			p. 97

**RATINGS** 5-point scale High Reasonable Moderate Low Very low. See individual company analyses.  
Assessments were made based on public information identified by the authors. A poor rating may not necessarily be an indication that a company's climate strategy is weak, but could also indicate that the information was insufficient to confirm good practice. Ambitious companies can improve their ratings by ensuring that all aspects of their climate responsibility strategies are transparently and accurately disclosed, and in the public domain.

Figure 3.6- Corporate climate responsibility monitor scores (New Climate institute 2022)

If we take a glimpse at the results of the first analysis conducted by the New Climate Institute, we can finally end up saying that in general terms the concept of integrity embodies the most critical point for a company, hence we can see how in many cases a company is overperforming with respect to transparency but underperforming with respect to integrity. In general, this research concludes that none of the firms analyzed ended up in the top-level position, and instead the almost 44% of them reached the lowest position in terms of climate performance with respect to their pledges (New Climate Institute, 2022).

In order to recap with respect to each of the three indexes we have been assessing, we will now highlight their upsides and pitfalls as well as the specific situations in which it would be more convenient to use one indicator rather than another as shown in figure 3.7.

	ESG risk ratings	ESG commitment level	Corporate Climate Responsibility Monitor
<b>Industry typology</b>	<i>Companies belonging to whatever industry</i>	<i>Companies belonging to the Asset Management subindustry</i>	<i>Companies belonging to whatever industry</i>
<b>Issues analysed</b>	<i>Twenty standardised ESG issues</i>	<i>General ESG issues</i>	<i>General environmental issues</i>
<b>Objective</b>	<i>Actual risk potentially leading up to dropping enterprise values in the future</i>	<i>Evaluation of the current commitment of the company to the issues</i>	<i>Evaluation of the current and future commitment</i>
<b>Outcome</b>	<i>Unique quantitative value expressed through a score ranging from 0 to 100</i>	<i>Unique qualitative value expressed out of a five-value scale</i>	<i>Two qualitative values describing transparency and integrity expressed out of a five-value scale</i>

Figure 3.7.- Key insights of the three indicators for Greenwashing (own elaboration)

The very first difference among the indicators we introduced lies in the industry typologies that our indexes allow us to analyze. In particular, while both ESG risk ratings and Corporate Climate Responsibility Monitor allow not only the analysis but also the comparison of any kind of company across all the industry sectors, when it comes to the ESG commitment level we need to be wary of the fact that just asset management companies can be assessed. Therefore, if our main goal in terms of broadness of our analysis is to make a comparison across different industries, then the first two mentioned indicators need to be chosen, conversely if we want to deploy a more precise evaluation method limited to asset management companies, then the ESG commitment level by Morningstar needs to be used. Another discriminant factor – as highlighted above – is the focus on the issues analyzed, in fact each of the indicators has different parameters of measurement. While in the first analyzed indicator, Sustainalytics analyses twenty different ESG issues, the ESG commitment level measures in general the whole package of ESG issues, and finally the Corporate Climate Responsibility monitor is exclusively focused on climate issues. Therefore, as long as our concern is on Climate Finance, then the latter is the ideal solution,

instead when we want to come up with insights from Sustainable Finance, then we will enlarge our choice to either ESG risk ratings or ESG commitment level.

Needless to say, each of the presented indicators has a genuine scope being different than any other, in fact while the ESG risk ratings measures the actual risk that in the future could lead up to a dropping enterprise value, the other indexes are instead a measure of how committed a company is in the field of either climate or sustainability issues. Thus, while in the first case companies recording high scores can be associated to greenwashing, for the second bunch of indicators it is exactly the contrary.

Finally, while the output of first two analyzed indicators is a unique measure being in the first case expressed on a quantitative scale from 0 to 100, and in the second case on a more qualitative one, if we pick the Corporate Climate Responsibility Monitor two are the measurements being provided on a qualitative scale: one for transparency and another for integrity.



## **Chapter 4: Greenwashing or green investments: what is best for the company?**

### **4.1 The lack of clarity around green investments and financial returns**

The presentation of the problem of greenwashing we gave in Chapter 2 has been followed in the previous chapter by the introduction of some considerations around the different measurements of greenwashing from a more objective point of view.

Therefore, while Chapter 3 was more a solution to the problem of measuring greenwashing, this chapter will try to deal with the issue of whether or not - from the point of view of the market evaluation - for a company it is really convenient to opt for greenwashing practices rather than striving for green investments, hence we will finally try to answer the overarching quest on whether or not greenwashing add up value for a company.

If we recall the meaning of ESG risk ratings we introduced as one of the possible ways to indirectly measure greenwashing, we can see how this indicator shows the level of financial material risk which is likely to shrink the enterprise value of the company in the future (Sustainalytics 2018). Therefore, we can conclude that under this idea, we need to expect that a below-average performance in managing ESG issues – that might be linked to greenwashing – lead up to slowing down the enterprise value of the company itself in the long-run.

Although this association we have just drawn, one can argue that figuring out a unique way to finally describe how the presence or absence of green investments impacts the financial performance of a company is definitely harsh to depict. In fact, what we have just pointed out is confirmed from empirical pieces of evidence such as those drawn by Horvathová (2010) who was definitely able to run empirical research in order to discover the sign of the relationship occurring between green investments and financial performance. In particular, while running a meta-analysis on 64 different studies – 48 of which from US and Canada, and the remaining from Europe – the author found out that around 16% shows a negative sign, 55% instead a positive sign, and the remaining 29% shows instead an insignificant behavior, as described in figure 4.1.

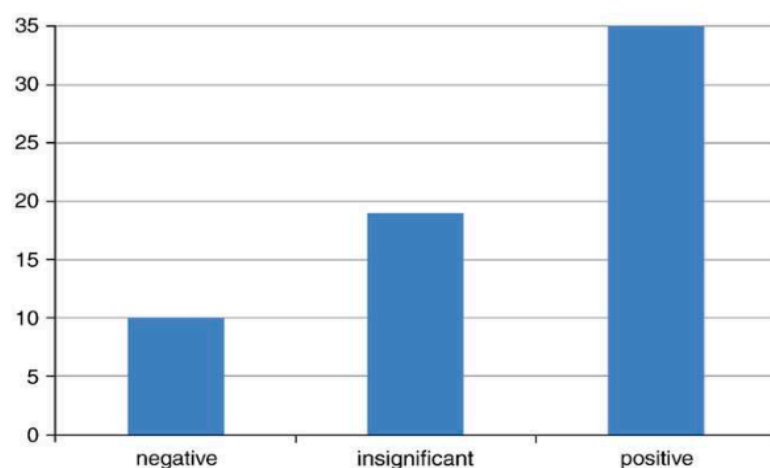


Figure 4.1 – Bar chart distributions of the correlation pattern between enterprise value and green investments (Horvátová 2010)

Therefore, this lack of clarity on the topic of whether a green company is able to ultimately reach an above-average performance could be one of the reasons triggering the decision of not integrating CSR into its corporate policy.

In particular, according to the previous statistics we can remark the fact that positive effects of green investments are exhibited not only when measuring performance with ROE, but also when dealing with more operational indicators such as ROA and ROS (Bradgon & Martin 1972; Hart and Ahuja 1996).

On the other hand, we have situations showing that if we take the same indexes (Wagner et al. 2002; Cordeiro & Sarkis 1997) either negative or no correlation at all can be ultimately found out.

Hence, as shown by taking into consideration several studies, a more appropriate research question should not be inquiring on whether or not it pays off to be green, but more appropriately when, for which companies, and how it pays off (Telle 2006; King & Lenox 2001; Ghisetti & Rennings 2014).

On top of that, by the end of this chapter we will also discuss some findings directly linking company's financial performance with greenwashing procedures.

## 4.2 When and for what companies does it pay to be green?

In our introduction, we reached the conclusion that as long as many studies show different patterns, it is not possible to come up with the outcome that green innovations engender better financial performance of the company and growth.

However, what we can do is to essentially grasp for what companies - in terms of the pace at which the firm grows, hence for example fast-growing or struggling – and when – intended as the firm's age - chasing after green innovations is more likely to be a rewarding choice for companies.

Interesting empirical evidence highlighting a consistent answer to the two previous questions flows from Leoncini et al. (2017), where the empirical relationship shown in figure 4.2 is investigated.

$$\begin{aligned}
 Growth_{it} = & \alpha + \beta_1 Pat\ Green_{i,t-1} \\
 & + \beta_2 Pat\ Nongreen_{i,t-1} + \beta_3 Age_{i,t-1} \\
 & + \beta_4 (Pat\ Green\ X\ Age)_{i,t-1} \\
 & + \beta_5 (Pat\ Nongreen\ X\ Age)_{i,t-1} \\
 & + \mathbf{z}_{i,t-1}'\gamma + \delta_t + \mu_i + \varepsilon_{it}
 \end{aligned}$$

Figure 4.2 – Relationship investigated through regressive analysis (Leoncini et al. 2017)

On one hand, the very first thing we need to clarify is concerned with the fact that within the previous relationship, the only dependent variable is  $Growth_{it}$  being the difference between the logarithm of the employees of firm  $i$ 's at time  $t$  and time  $t-1$ . In particular, what we need to remark is essentially the fact that the measurement of firm's growth is basically tracked by the number of employees due to the fact that this is believed to be among the best indicators showing the growing path of a company straight after an investment is made, as the company itself tends to invest its own extra-returns in expanding its workforce (Leoncini et al. 2017).

On the other hand, it is worth highlighting the main independent variables, among which we have (Leoncini et al. 2017):

- $Pat\ Green_{i,t-1}$ , being the logarithm of the stock of green patents owned by the company during the year  $t-1$
- $Pat\ Nongreen_{i,t-1}$ , being the logarithm of the stock of non-green patents owned by the company during the year  $t-1$
- $Age_{i,t-1}$ , being instead the logarithm of the number of years since the constitution of the company
- $Emp_{i,t-1}$ , being the logarithm of the number of employees in the year  $t-1$



-*Inv Tang*<sub>*i,t-1*</sub>, calculated as the log transformed of the investment in physical capital in the year t-1

-*Inv Int*<sub>*i,t-1*</sub>, calculated as the log transformed of the investment in intangible capital during the year t-1

-*Herfindahl index*<sub>*jt*</sub>, being the Herfindahl-Hirschman index for the industry j at time t, being an indicator of the competition in a given industry among different firms.

With respect to the data that have been used in this occasion, we can say that a dataset of 5498 manufacturing Italian companies related to the period 2000-2008 has been used. Moreover, the regressive technique that has been used is the quantile regression approach which has been chosen due to the fact that it allows a better characterization of the data highlighting the relationship between independent variables and growth rate at each quantile of the distribution of the growth rate, and not just with respect to the mean (Leoncini et al. 2017).

Therefore, starting from the relationship we expressed out within Figure 4.2, and by applying to it the aforementioned quantile regression approach, Leoncini and others (2017) were able to finally come up with an answer to both their research questions.

On one hand, the former research question describing for what companies pay off to invest in green innovations is actually answered in Figure 4.3 within which the values of the analysis are reported.

	q10	q25	q50	q75	q90
Age <sub><i>t</i> - 1</sub>	0.098*** (0.002)	0.089*** (0.001)	0.081*** (0.001)	0.074*** (0.001)	0.061*** (0.002)
Pat Green <sub><i>t</i> - 1</sub>	0.021** (0.009)	0.022*** (0.002)	0.021*** (0.001)	0.025*** (0.003)	0.023*** (0.006)
Pat Nongreen <sub><i>t</i> - 1</sub>	0.007*** (0.002)	0.013*** (0.001)	0.014*** (0.000)	0.015*** (0.001)	0.020*** (0.002)
Emp <sub><i>t</i> - 1</sub>	- 0.424*** (0.002)	- 0.437*** (0.001)	- 0.447*** (0.000)	- 0.458*** (0.001)	- 0.473*** (0.001)
Inv Intang <sub><i>t</i> - 1</sub>	- 0.001 (0.001)	0.002*** (0.000)	0.004*** (0.000)	0.006*** (0.000)	0.008*** (0.001)
Inv Tang <sub><i>t</i> - 1</sub>	0.016*** (0.001)	0.015*** (0.001)	0.016*** (0.000)	0.017*** (0.000)	0.021*** (0.001)
Herfindahl index <sub><i>t</i></sub>	- 0.152 (0.174)	- 0.044 (0.073)	0.016*** (0.006)	0.072 (0.044)	0.178*** (0.060)
Constant	1.049*** (0.007)	1.184*** (0.008)	1.287*** (0.004)	1.374*** (0.005)	1.470*** (0.010)
Pat Green-Pat Nongreen difference test	0.014 (0.01)	0.009*** (0.002)	0.007*** (0.001)	0.009*** (0.003)	0.004 (0.006)
Test for intra-industry correlation	14.860***	5.528***	- 0.147	10.893***	14.722***
Firm-year obs			30,670		
Firm obs			5498		

Year dummy variables have been included in all of the models. Bootstrapped standard errors are reported in parentheses. They are based on 1000 replications of the data

\* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\*  $p < 0.01$

Figure 4.3 – For what company does it pay to be green? (Leoncini et al. 2017)

As we can see by looking into the values obtained for the five different quantiles corresponding to the independent variables representing green and non-green patents first, and by then observing the difference test between the two independent variables, what it comes out is that in both 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentiles green patents do have a more intense effect on growth than non-green patents and it can be stated with a 99% confidence interval. Moreover, if we consider both 10<sup>th</sup> and 90<sup>th</sup> percentiles, we can observe how the effect of green innovations do not have a more remarkable effect than that of non-green ones on firm's growth.

Therefore, the first research question can be answered by pointing out that it does make sense to invest in green innovations for companies that are not positioned either in the first or in the last percentiles, hence – more in practical terms - for all the companies exception made for those which are either struggling to survive or growing excessively. The reason behind the former exception might lie into the fact that those struggling companies are already burdened with loads of costs that adding up even more uncertainty and huge investments might face even tougher conditions (Leoncini et al. 2017). Conversely, the reason behind the second conclusion can be found into the fact that outperforming

companies adding up to their outstanding investments portfolio such an uncertain risky project such as the eco-friendly one can take the portfolio to a lower level of performance. On the other hand, the latter research question is mainly intertwined with when – during the lifecycle of the company – makes more sense for a company to finally be engaged with green innovations. In order to find an answer to this question, Leoncini et al. (2017) run the same analysis as before with the only difference that now the two independent variables known as green and non-green patents are now linked to the age of the company as shown in Figure 4.4.

	q10	q25	q50	q75	q90
$Age_{t-1}$	0.082*** (0.018)	0.097*** (0.003)	0.088*** (0.001)	0.081*** (0.001)	0.072*** (0.001)
$Pat\ Green_{t-1}$	- 0.012 (0.057)	0.020 (0.019)	- 0.002 (0.009)	- 0.012*** (0.003)	- 0.020** (0.010)
$Pat\ Nongreen_{t-1}$	0.026 (0.041)	0.010 (0.015)	0.023*** (0.004)	0.023*** (0.003)	0.020*** (0.004)
$Pat\ Green_{t-1} \times Age_{t-1}$	0.011 (0.017)	0.000 (0.005)	0.008*** (0.003)	0.011*** (0.001)	0.014*** (0.003)
$Pat\ Nongreen_{t-1} \times Age_{t-1}$	- 0.004 (0.012)	- 0.001 (0.005)	- 0.003** (0.001)	- 0.003*** (0.001)	- 0.002 (0.001)
$Emp_{t-1}$	- 0.455*** (0.020)	- 0.424*** (0.002)	- 0.437*** (0.001)	- 0.447*** (0.000)	- 0.458*** (0.001)
$Inv\ Intang_{t-1}$	0.005*** (0.001)	- 0.001 (0.001)	0.002*** (0.000)	0.004*** (0.000)	0.006*** (0.000)
$Inv\ Tang_{t-1}$	0.020*** (0.002)	0.016*** (0.001)	0.015*** (0.001)	0.016*** (0.000)	0.017*** (0.000)
Herfindahl index <sub><i>t</i></sub>	0.046*** (0.011)	- 0.151 (0.158)	- 0.043 (0.075)	0.019*** (0.005)	0.072* (0.042)
Constant	1.233*** (0.062)	1.074*** (0.012)	1.198*** (0.008)	1.295*** (0.007)	1.382*** (0.006)
Test for intra-industry correlation	15.142***	5.468***	- 0.102	10.685***	14.730***
Firm-year obs			30,670		
Firm obs			5498		

Year dummy variables have been included in all of the models. Bootstrapped standard errors are reported in parentheses. They are based on 1000 replications of the data

\* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

Figure 4.4- When does it pay to be green? (Leoncini et al. 2017)

According to what can be observed in the table, it can be stated that green patents does have a considerable positive effect on growth at the level of 50<sup>th</sup>, 75<sup>th</sup>, and 90<sup>th</sup> percentiles. Put it simpler, it can be stated that older companies find it easier to transform eco-innovations into growth opportunities.

From a more managerial slant, this aspect can be motivated by the following crucial points:

- An older firm does have a major learning capability with respect to a startup against harsh and difficult-to-implement green investments and projects (Carrillo-Hermosilla et al. 2010; Tsai 2012)
- New companies might be more hostile to fresh green technologies due to their greater uncertainty with respect to stable technologies that have already been consolidated (Consoli et al. 2016)
- Given the incredible financial complexity of undiscovered green technologies, mature companies do have a better and more open access to financing sources with respect to less mature firms (Schneider and Veugelers 2010)
- Older companies have a stronger spur from the governments than the newer ones in order to comply with green regulation, hence they are induced to renovate their old capital (Ruth et al. 2004).

To sum up, one can take in that it does make sense to invest in green technologies for all those companies being positioned in the boundaries of a non-extreme growth path: meaning that they neither belong to the struggling array of firms, not to the fast-growing one. Hence, with respect to the lifecycle we observed how an older company is much more ready to embark on the journey of green techs than a new created one.

Lastly, the importance of this discussion lies into the fact that from a context of uncertainty such as the one depicted by the research paper of Horv  thov   (2010), we arrived to finally individuate those companies for which the decision of heading for green investments would be more suitable both in terms of both age of the company and its pace of growth. It finally means that all those companies being not as mature as the ones previously described together with both fast growing and slow growing ones might not be spurred at opting for these investments, hence for them greenwashing might be a viable solution.

### **4.3 What kind of green innovation does it pay off?**

So far in the totality of the previous discussion, we have been facing the main argument of getting to know for which kind of companies it would be rewarding to invest in green innovations.

Now, we instead want to characterize the scenario of interest for which investing in green technologies makes sense within the boundaries of the typology of innovation, hence the main focus shifts from the company to the particular type of innovation.

In particular, we will firstly dive into the relationship between green innovations and market value, and then we will give a glimpse to the relationship between green patents and market value.

### ***4.3.1 Environmental innovation (EI) and firm's performance***

Whenever a company chases after environmental innovation (EI), we need to understand which kind of innovation we are referring to, and in particular, whether we are referring to energy and resource efficiency innovations (EREI), whose aim is at reducing the input needed for output generated, or to externality reducing innovations (ER) whose main aim is at reducing the externality generated (Ghisetti & Rennings 2014).

The main hypothesis of the authors is firstly that a different impact on top of firm's performance needs to be expected according to whether we refer to EREI or to ER, with the former being characterized by the fact that they indeed lead up to a sort of “win-win” situation since environmental performance is improved while the economic-related one is strengthened, and the latter in which instead there is no-presence of “win-win” situation due to the fact that the main and unique goal of the company in this act would be to slow down the environmental impact of its operations (Ghisetti & Rennings 2014). In order to respond to the previous overarching research questions, authors opted for gathering data from the Centre for European Economic Research in Mannheim while collecting 1063 different observations.

The whole econometric analysis based on the aforementioned data has been mainly carried out on the equation in figure 4.5.

$$OM_i = \alpha + \beta_1 EREI_i + \beta_2 ER_i + \beta_3 MS_i + \beta_4 HHI_i + \beta_5 SIZE_i + \gamma SECT_i + \epsilon_i$$

*Figure 4.5- Equation firm performance – green investments (Ghisetti & Rennings 2014)*

What we can observe from the previous equation is essentially that our unique dependent variable is OM known as operating margins. On the other hand, with respect to the bunch of independent variables, we have (Ghisetti & Rennings 2014):

- EREI, described as Energy and Resource Efficiency Innovations
- ER, known as externality reducing innovations
- MS, representing the firm's market share
- HHI, being the classic Herfindhal concentration index

-SIZE, calculated as the natural logarithm of employees

-SECT, being the sector with respect to which the company belongs.

With respect to our analysis, we can observe the whole array of our results flowing from our regressive analysis within figure 4.6.

	(I)	(II)	(III)	(IV)
EI	0.3976 (0.4984)			
EREI		1.8502*** (0.6578)	1.7776*** (0.6591)	1.7403*** (0.6579)
ER		-1.1512* (0.6753)	-1.1915* (0.6821)	-1.2831* (0.6795)
SIZE	-0.0408 (0.1305)	-0.0504 (0.1306)	-0.1114 (0.1383)	-0.1457 (0.1397)
MS	0.6053 (0.7713)	0.6266 (0.7633)	0.6088 (0.7627)	0.6964 (0.7662)
HHI	-0.0041 (0.0029)	-0.0040 (0.0029)	-0.0041 (0.0029)	-0.0044 (0.0030)
RD			0.4938 (0.4558)	0.2890 (0.4832)
LPAT			0.0470 (0.0630)	0.0469 (0.0629)
EAST				-0.0468 (0.4208)
PC				0.5902 (0.4520)
Constant	2.8375*** (0.9344)	2.8254*** (0.9399)	3.2666*** (1.1847)	3.3091*** (1.1855)
Insigma Constant	1.8180*** (0.0280)	1.8146*** (0.0281)	1.8136*** (0.0281)	1.8126*** (0.0281)
N	1063	1063	1063	1063
MLCox-Snell R <sup>2</sup>	0.055	0.061	0.063	0.065

Standard errors in parentheses \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01  
19 Sector Dummies, jointly significant (Wald Test), have been included

Figure 4.6- Results of the regressive analysis (Ghisetti & Rennings 2014)

If one reads the results obtained by the analysis conducted by the authors exposed in the table, they can notice how the variable EI named as environmental investments does not suggest a positive impact on operating margins by itself. However, if we split up the investments in EREI (energy and resource environmental investments) and ER (externality reduction investments), then we can observe that in each of the three tests which have been carried out, the impact of the first kind of investments (EREI) is positive and considerable, while instead the second array of investments (ER) exhibits a negative influence on the operating margins.

From a more practical slant, we can state that in the case of externality reduction innovations (ERs) we can basically point out that they are costly processes in order to abate negative externalities, but these costs are not overcome by the benefits to the company (Ghisetti & Rennings 2014). In order to better characterize those investments belonging to the category we described as EREI, we can practically enlist the following investments having as aim the following (Ghisetti & Rennings 2014):

- Reduced material per unit of output
- Reduced energy per unit of output
- Reduced CO2 footprint.

On the other side, ER investments can be:

- Reduced air pollution
- Reduced water pollution
- Reduced soil pollution
- Reduced noise pollution
- Replaced dangerous materials.

As it is clear from the two different typologies of scope, while the first aims are more linked to the reduction of input per unit of output intrinsically leading up to a lower cost for the company, the latter are more intertwined with the reduction of externalities impacting the environment and its resources which would need a major amount of resources, though costs in order to be achieved.

#### ***4.3.2 The relationship between green patents and market value***

Within the boundaries of this chapter, we are trying to really depict a final interpretation of what investing in green technologies looks like, and though trying finally getting the reason behind which in some cases greenwashing is preferred to green investments.

Firstly, we discussed about the company typologies in terms of both growth rate and age with respect to which proceeding with green investments does make sense.

Then, we moved on by concentrating our attention on the investment typology, hence in the previous discussion we came up with the conclusion that those energy and resource environmental investments are the ones providing better returns for the company.

Now, by relying on the paper of Colombelli et al. (2020), we want to basically characterize the influence exerted by a specific set of green investments - known as green patents - onto the market value of the firm inventing the new piece of technology. In order to better clarify

this analysis, we need to explain the concept of green patents which is known as the patents of technologies mainly concerning waste, disposal, and renewable energy (OECD 2015). This empirical analysis – which has been conducted on a sample of 11.007 observations describing the behavior on the stock market by more than 4000 firms over the timespan 2002-2011 provided by the OECD – has entirely been based on the Cockburn and Griliches (1988) equation according to which the market value of a company does reflect its tangible and non-tangible assets, which are also intended as knowledge capital as shown by figure 4.7.

$$V_{i,t} = b_t(A_{i,t} + \gamma KC_{i,t})^\sigma,$$

*Figure 4.7 – Market value equation as a function of the assets owned by the company (Cockburn & Griliches 1988)*

Within the previous figure, we can mainly observe that our dependent variable is the market value of the company, instead the other two parameters do reflect the both the tangible assets and knowledge base owned by the company at the time t at which it is evaluated.

By then decomposing the second component representing the knowledge base of the company, we can then introduce a set of different independent variables which will be helpful in explaining the results obtained by running the empirical analysis, namely (Colombelli et al. 2020):

- R&D/Assets, being the ratio between the amount of R&D owned by the company and its assets
- PAT/R&D, being the portion of patents owned by the company as a part of its R&D operations
- GT/R&D, being the portion of green technologies (patents) out of the overall R&D activity
- PAT\_NOGT/R&D, finally representing the overall amount of non-green patents as a function of R&D activities.

The results of the analysis relatively with respect to those companies of the panel disclosing R&D information are shown in figure 4.8.



	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
R&D/Asset	0.0044*** (0.0016)	0.0044*** (0.0016)	0.0044*** (0.0016)	0.0044*** (0.0016)	0.1187*** (0.0200)	0.1188*** (0.0200)	0.1188*** (0.0200)	0.1191*** (0.0201)
PAT/R&D	0.0304** (0.0118)				0.0591*** (0.0099)			
SIZE	-0.2470*** (0.0085)	-0.2472*** (0.0085)	-0.2468*** (0.0085)	-0.2458*** (0.0085)	-0.1672*** (0.0166)	-0.1666*** (0.0166)	-0.1667*** (0.0166)	-0.1654*** (0.0166)
GT/R&D		0.0934** (0.0413)	0.0457 (0.0708)	0.0456 (0.0704)		0.2233*** (0.0186)	0.2341** (0.0978)	0.2342** (0.0992)
PAT_NOGT/R&D			0.0215 (0.0249)	0.0219 (0.0249)			-0.0035 (0.0324)	-0.0034 (0.0329)
EPS				0.2842* (0.1509)				0.2809 (0.2700)
Constant	-2.0500*** (0.2977)	-2.0361*** (0.3001)	-2.0496*** (0.2977)	-2.1132*** (0.2967)	-3.1544*** (0.2570)	-3.1678*** (0.2570)	-3.1673*** (0.2571)	-3.2494*** (0.2680)
N	4831	4831	4831	4831	1419	1419	1419	1419
R <sup>2</sup>	0.439	0.439	0.439	0.439	0.447	0.448	0.448	0.449
Adj. R <sup>2</sup>	0.4350	0.4350	0.4351	0.4354	0.4419	0.4437	0.4433	0.4433
Predict R&D	No	No	No	No	No	No	No	No
Sample	Full	Full	Full	Full	Filter	Filter	Filter	Filter
Sector fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
Time fixed effect	Y	Y	Y	Y	Y	Y	Y	Y

Standard errors in parentheses.

\* $P < 0.10$ , \*\* $P < 0.05$ , \*\*\* $P < 0.01$ .

Figure 4.8- Results of MV equation for R&D reporting firms (Colombelli et al. 2020)

Notice that the previous results are just related to those companies that in the sample of observations tend to disclose their R&D expenses, however similar results are also obtained when analyzing those companies not disclosing their R&D activity.

As we can observe the market value of the company is positively and significantly influenced not only by R&D activities (R&D/Asset), but also by patenting activities (PAT/R&D). If we then decompose our patenting activities into green (GT/R&D) and non-green patents (PAT\_NOGT/R&D), then we can observe that while the former exhibits a positive and significant influence on the market value, the latter does not show any significant correlation. Therefore, once again we have been able to discover that whenever a company focuses our attention on the creation of new pieces of knowledge linked to environmental and green issues in such a way to generate green patents, we end up in a situation where the market evaluates it positively, hence the firm's market value surges.

## **4.4. Does it pay to greenwash?**

### ***4.4.1. Introduction***

Insofar, as our overarching goal is to understand the dynamics leading up to the adoption of greenwashing procedures by brown companies, we analyzed the boundaries within which it does make sense for a company to plug in its resources in green investments.

Firstly, we discovered that companies enjoying brilliant results in this sense are all the companies with exception of both the struggling and fast-growing ones. Then, we added up that out of these companies, the older ones should be pursuing this path.

Therefore, our first conclusion might be that the motivation to pursue greenwashing could be adopted by all those either struggling or fast-growing companies, or in general the younger ones.

On the other hand, we discovered that out of the whole array of green investments a company might opt for, energy and resources environmental investments (EREI) pay off much better than externality reduction investments (ER), and in particular if those investments are made with the intention of generating green patents, then we can end up saying that they do pay off in terms of enhancement of the market value of the company. Hence, we can state that all those investments whose main aim is at the reducing externalities, as well as those not intertwined with the production of green patenting might not lead up to consistent market value results, though it could be another reason for which companies might decide to opt for greenwashing procedures.

Therefore, it is in this light that our current goal is to finally try discovering whether greenwashing can be a valid alternative for a company in order to increase its market value as opposite to both those aforementioned kinds of investment and companies for which green alternatives do not adequately pay off in terms of market value increase.

### ***4.4.2. Market value and greenwashing***

An important paper in this sense, that focuses on the importance of greenwashing and market value flows from China and has been published for the first time in 2014 by Du.

Within this research paper, on the one hand the author tries finding out a correlation between the market value of a company and greenwashing. Notice that in order to account for the real market value of the company the measure of cumulative abnormal returns (CARs), which is

calculated as the sum of abnormal returns being intended as those returns differentiating from the investment's expected ones (Investopedia 2021).

On the other hand, we instead need to underline that the paper also highlights the correlation between corporate environmental performance and market value.

In detail, we can point out that while with respect to the former argument, the author's hypothesis is to foresee a negative correlation between greenwashing and market value (measured in CAR), with respect to the latter his hypothesis follows the logic for which a high-level corporate environmental performance is associated to a positive market evaluation.

Notice that in order to carry out this analysis, the author has mainly gathered data from the Chinese stock market (CSMAR) as well as from the South Weekend being one of the most influential Chinese newspapers which has been used in order to derive whether or not a company is subjected to greenwashing during the period 2011-2012 (Du 2014).

In order to study the previously mentioned hypothesis, we actually need to observe two similar relationships having both as dependent variable the cumulative abnormal return (CAR) calculated between day -1 to day t, and several independent variables being pretty similar with the exception of the main independent variable which instead differs from one hypothesis to the other.

While in the very first hypothesis, the central independent variable of the equation (figure 4.9) is named as GREENWASH and it is considered as a dummy variable being evaluated as 1 whenever the firm does greenwash and 0 whenever it does not according to the South weekend journal, in the second hypothesis represented by the equation in figure 4.10, the main independent variable is ENV or corporate environment performance score reached by the company in the very last year (Du 2014).

$$\begin{aligned}
 CAR[-1, t] = & \alpha_0 + \alpha_1 GREENWASH + \alpha_2 FIRST + \alpha_3 DUAL \\
 & + \alpha_4 INDR + \alpha_5 LNBOARD + \alpha_6 SIZE + \alpha_7 LEV \\
 & + \alpha_8 ROA + \alpha_9 MTB + \alpha_{10} CROSS + \alpha_{11} ST \\
 & + \alpha_{12} GEB + \alpha_{13} SMEB + \alpha_{14} EXCHANGE \\
 & + \alpha_{15} LISTAGE + \alpha_{16} STATE \\
 & + Industry Dummies + Year Dummies + \varepsilon
 \end{aligned}$$

Figure 4.9- Equation Hypothesis 1 (Du 2014)

$$\begin{aligned}
CAR[-1, t] = & \beta_0 + \beta_1 ENV + \beta_2 FIRST + \beta_3 DUAL \\
& + \beta_4 INDR + \beta_5 LNBOARD + \beta_6 SIZE \\
& + \beta_7 LEV + \beta_8 ROA + \beta_9 MTB + \beta_{10} CROSS \\
& + \beta_{11} ST + \beta_{12} GEB + \beta_{13} SMEB + \beta_{14} EXCHANGE \\
& + \beta_{15} LISTAGE + \beta_{16} STATE \\
& + \text{Industry Dummies} + \text{Year Dummies} + \delta.
\end{aligned}$$

Figure 4.10- Equation Hypothesis 2 (Du 2014)

As we can observe from the previous two equations that have been used to support the two hypotheses, apart from the two main independent variables, all the remaining have been left the same and can be better observed in figure 4.11.

Variables	Definition	Data source
Variable for main tests		
CAR [-1, t]	CAR from day -1 to day t (t = 0, 1, 2, 3, 4, 5) using industry-adjusted model (Kolari and Pynnönen 2010; Lewellen and Metrick 2010);	Author's calculation based on the original data form CSMAR
GREENWASH	A dummy variable, equaling 1 if a firm was exposed to be an environmental wrongdoer with greenwashing by the <i>South Weekend</i> and 0 otherwise;	Author's hand-collected data from the <i>South Weekend</i>
ENV	Corporate environment disclosure score in last year (please refer to Table 8 in Appendix in detail);	Author's hand-collected data
FIRST	The percentage of shares owned by the controlling shareholder;	CSMAR
DUAL	An indicator variable, equaling 1 if the same person serves as the CEO and the chairman of the board of directors and 0 otherwise;	CSMAR
INDR	The ratio of the number of independent directors to the number of directors in the boardroom;	CSMAR
LNBOARD	The natural log of the number of directors in the boardroom;	CSMAR
SIZE	Firm size, measured as the natural log of total assets;	CSMAR
LEV	Financial leverage, measured as the ratio of total liabilities to total assets;	CSMAR
ROA	Returns on total assets, measured as net operating income deflated by total assets;	CSMAR
MTB	Market-to-book ratio, measured as the market value of a firm to its book value (book value is calculated by looking at the firm's historical cost or accounting value, and market value is determined in the stock market through its market capitalization);	CSMAR
CROSS	A dummy variable of listing locations, equaling 1 when a firm's stock has listed in two or more markets and 0 otherwise;	CSMAR
ST	A dummy variable of listing status, equaling 1 when a firm's stock is denoted as special treatment (i.e., ST) or special treatment with star (i.e., *ST) and 0 otherwise;	CSMAR
GEB	A dummy variable, equaling 1 when a firm lists in growth enterprise board (GEB) and 0 otherwise;	CSMAR
SMEB	A dummy variable, equaling 1 when a firm lists in small and median enterprise board (SMEB) and 0 otherwise;	CSMAR
EXCHANGE	A dummy variable of listing markets, equaling 1 when a firm lists in Shanghai Security Exchange and 0 otherwise;	CSMAR
LISTAGE	The number of years since a firm's IPO;	CSMAR
STATE	A dummy variable, equaling 1 when the ultimate controlling shareholder of a listed firm is a (central or local) government agency or government-controlled state-owned enterprises and 0 otherwise;	CSMAR
CAR <sub>M</sub> [-1, t]	CAR from day -1 to day t (t = 0, 1, 2, 3, 4, 5) using market model (Baker et al. 2010);	Author's calculation
CAR <sub>A</sub> [-1, t]	CAR from day -1 to day t (t = 0, 1, 2, 3, 4, 5) using market adjusted model (Brown and Warner 1985);	Author's calculation
ENV_RANK	The ordered variable according to the rank of corporate environment disclosure score in last year.	Author's hand-collected data

Figure 4.11- Independent variables explained (Du 2014)

If one takes a glimpse to the previous table, they can figure out the following most important independent variables among the remaining, namely (Du 2014):

-FIRST, DUAL, INDR, LNBOARD, being mainly intertwined with the corporate organization of the company

-SIZE, measured as the natural logarithm of the total assets

-LEV, being instead corresponding to the financial leverage of the company

-ROA, representing instead the return on assets generated by the company.

While running the empirical analysis on top of the equation expressed through figure 4.9, the multivariate tests show how the very first hypothesis for which greenwashing behavior is associated with a negative financial performance is indeed confirmed as a negative coefficient accompanies the variable GREENWASH all throughout the analysis (Du 2014). In particular, it is also shown by the graph depicted in figure 4.12 where we can basically observe that overtime the CAR of the greenwashing subsample is always inferior with respect to the CAR observed for the non-greenwashing subsample.

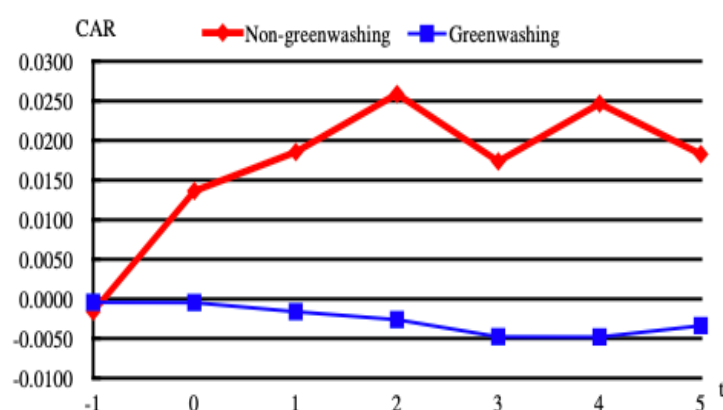


Figure 4.12 – CAR of greenwashing and non-greenwashing subsamples (Du 2014)

On the other hand, if we consider the multivariate tests of Hypothesis 2, then we can point out that while companies reaching high-level environmental scores are associated with positive CAR evaluation, on the other hand we have that low-level environmental scores are associated with a much lower CAR as shown in figure 4.13.

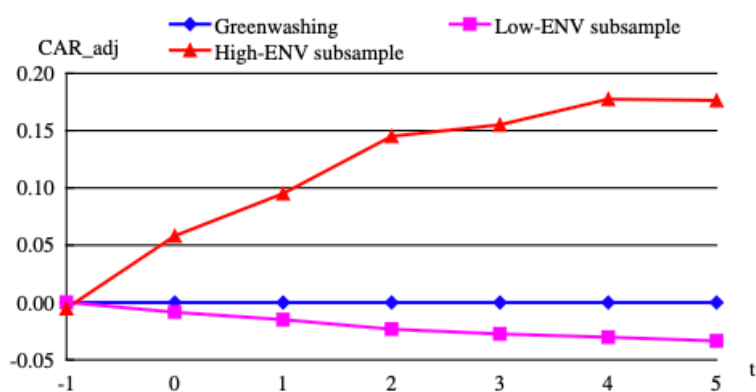


Figure 4.13 – CAR of high and low ENV subsample (Du 2014)

Finally, what it comes out of this discussion can be essentially expressed with the fact that - as hypothesized – whenever a firm is engaged with greenwashing procedures, it happens that the market negatively evaluates this behavior and as a result we will observe that the cumulative abnormal returns are indeed much lower (Du 2014). Accordingly, brilliant scores in terms of environmental procedures indeed corresponds to a better evaluation by part of the market with respect to companies reaching low-level scores (Du 2014).

Although the remarkable contribution by Du, we need to outline that – as we have already specified – within his paper, he measures greenwashing behaviors by companies according to the opinion of the media, and specifically of a journal named as South Weekend. Therefore, in order to have a more precise judgement on whether it really pays off to embark on greenwashing procedures, the same analysis that has been proposed could be made while utilizing as greenwashing indicator one of the indicators we introduced in Chapter 3 in order to come up with a relationship between market value and greenwashing indicator. In particular, checking out this relationship not only would yield major credibility to the fact that greenwashing engenders a negative effect on market value, but would also consolidate the consistency and strength of each of the indicators we proposed in order to track and measure the level of greenwashing activities of a company.

Despite the fact that if we pick the ESG risk ratings - one of the indicators that have been introduced – by definition we find out that it measures the current level of ESG risk that is most likely to drive down the market value of the company in the future due to its multiple influence on both future cash flow and WACC, one can end up arguing that most likely empirical evidences will show a lower level of market value corresponding to a high value of the indicator. Conversely, according to the nature of the two other indicators we introduced, and namely: ESG commitment level and Corporate Climate Responsibility monitor, we would also expect that the lower the value a company scores within these indexes – which is though associated with an increased greenwashing activity when positive communication is exerted- the lower will be its market value performance.

In conclusion, one of the main causes leading up to a decreasing market value associated to greenwashing activities should be consistent with the fact that, among whole the kinds of greenwashing, corporate greenwashing is heavily associated with a negative impact on the stakeholders' perception of the greenwashing company (Torelli et al. 2020).

## **4.5. Final considerations and chapter conclusion**

Within the boundaries of this chapter, our main goals were to find out the dynamics leading up to greenwashing behaviors, hence if it really pays off to be a wrongdoer rather than investing into green technologies.

As we discussed, we firstly established that it does make sense to focus on environmental issues for a company according to its age and speed of growth: with respect to the former we observed that experienced companies are more likely to react positively to these kinds of innovations, while with respect to the latter argument we know that major outcomes are reached by those companies being neither in a phase of excessive growth, nor in a struggling phase.

Secondly, our main goal has finally been to take in the rationale behind which kind of innovation should be chosen. What it comes out is essentially that among the whole array of environmental innovations (EIs), the most rewarding are the so-called energy and resources environmental investments (EREIs) due to their main characteristics of being essentially focused on cost reduction and efficiency improvements rather than externality reduction problems.

Moreover, we were finally able to observe how generally patenting innovations in the field of green technologies correspond to an augmentation of its market value with respect to the several innovations within which a company might embark on.

Therefore, we might think that companies majorly exposed to the threats of greenwashing are indeed the ones for which green investments do not pay off, namely: young companies, and both struggling and growing firms. Hence, another viable alternative to green investments might come to the mind of companies practicing externality reduction investments (ERs), hence not focusing either on EREIs or on green patents.

Although greenwashing might be thought as an option for the companies and investments we just mentioned, we need to stress out the fact that - as shown by the last research paper that has been analyzed – it does not pay off in terms of market value increase as instead it is for corporations reaching a high-level score in environmental practices.

## **Chapter 5: Recommendations to businesses and governments**

### **5.1. The need of a new mindset for managers and policymakers**

After the analysis we carried out in Chapter 4, we finally came to the conclusion suggesting that while green investments might lead up to a positive company's performance under certain conditions, greenwashing does not exhibit positive influence on a company.

Therefore, we will now draw some business and political implications that - when put in place – might engender the ultimate elimination of the problem of greenwashing.

### **5.2. Business implications**

Although it has been shown how there are margins for considering certain green investments in specific contexts, we can point out that efforts spent by companies in order to achieve their corporate social responsibility goals have not yet been as productive as they should have been due to two major issues (Porter & Kramer, 2006): on one hand due to the fact that it is very common to think that businesses and society are two opposite and different things, on the other hand instead companies tend to focus on corporate social responsibility in very broad terms while not conceiving it as a firm-specific operation. In other words, if companies were able to abate this discordance between business and society, they would end up conceiving CSR not anymore as a cost or constraint, but rather as a unique opportunity for growth and innovation.

With respect to the very first problem we have just mentioned, we need to underline the fact that while successful companies need a healthy society under which growing due to the fact that the services being proposed by a government - such as health and education - are indeed the pillars for building a strong workforce, at the same time an healthy society demands for successful corporations as they are furnaces of wealth, employment, and innovation enhancing the standards of living (Porter & Kramer, 2006). If we want to be more practical, we can say that the points of intersection between corporations and society are essentially two, namely: inside-out and outside-in linkages (Porter & Kramer, 2006).

The first type of linkage can be interpreted as the influence generated by the whole array of activities developed by a company within its value chain and having an external impact on the society as shown by figure 5.1 (Porter 1985).



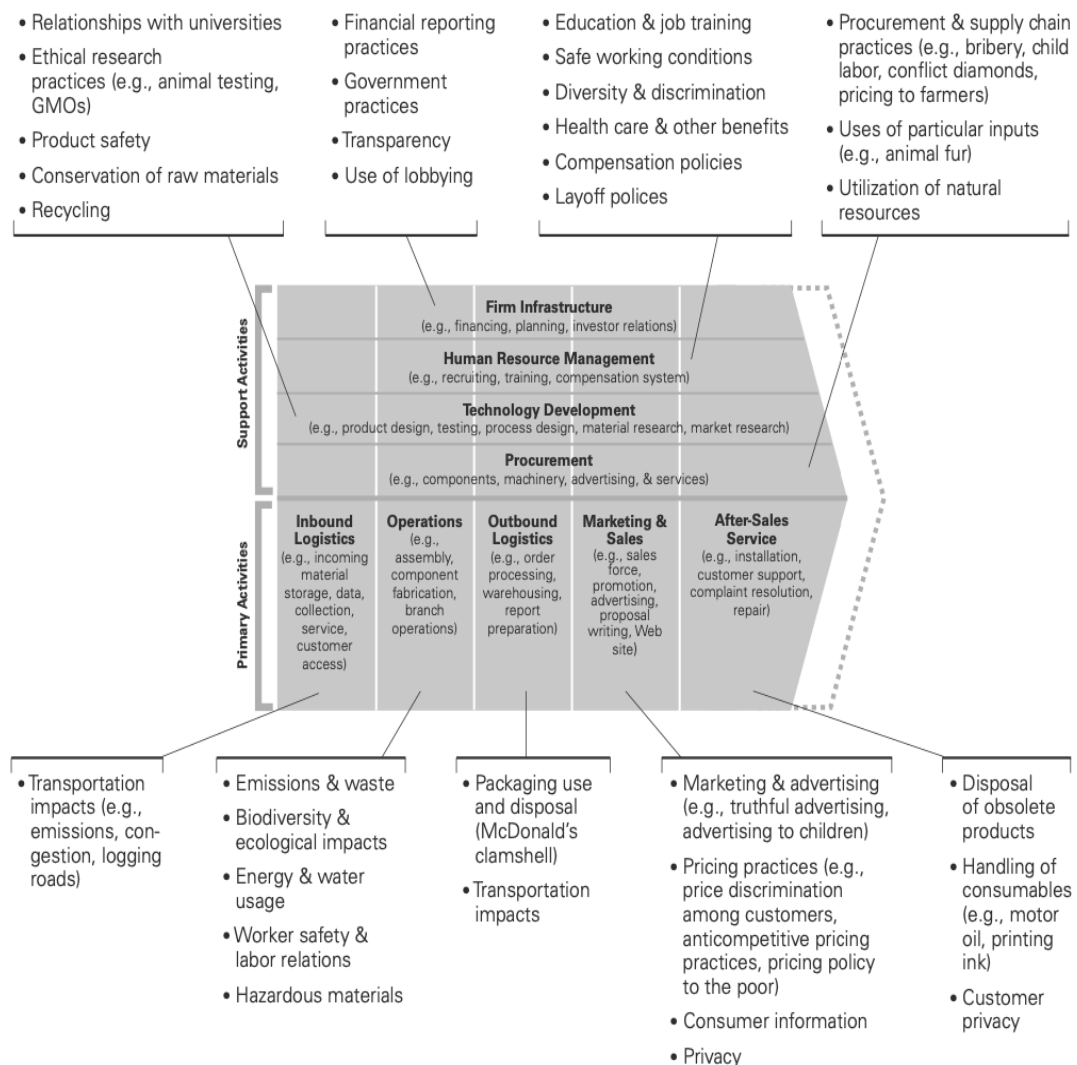


Figure 5.1 - The different activities in the value chain and their influence on the society (Porter 1985)

In the specific, we have the nine different activities compounding a company's value chain with the corresponding impact shown by these activities on top of the external society.

As an example, if we pick inbound logistics activities, we can easily identify that one of their impacts on the society lies into transportation and emissions. Following the same example, if we pick the activity known as human resource management, this has a strong impact on top of social themes such as compensation and layoff policies, diversity, safety, and also education and job training (Porter 1985).

Conversely, if we look at the outside-in linkages, we have to think about the fact that the competitive environment within which our company needs to operate in is indeed shaped by the society as shown in figure 5.2 by the diamond framework that has been drawn (Porter 1990)

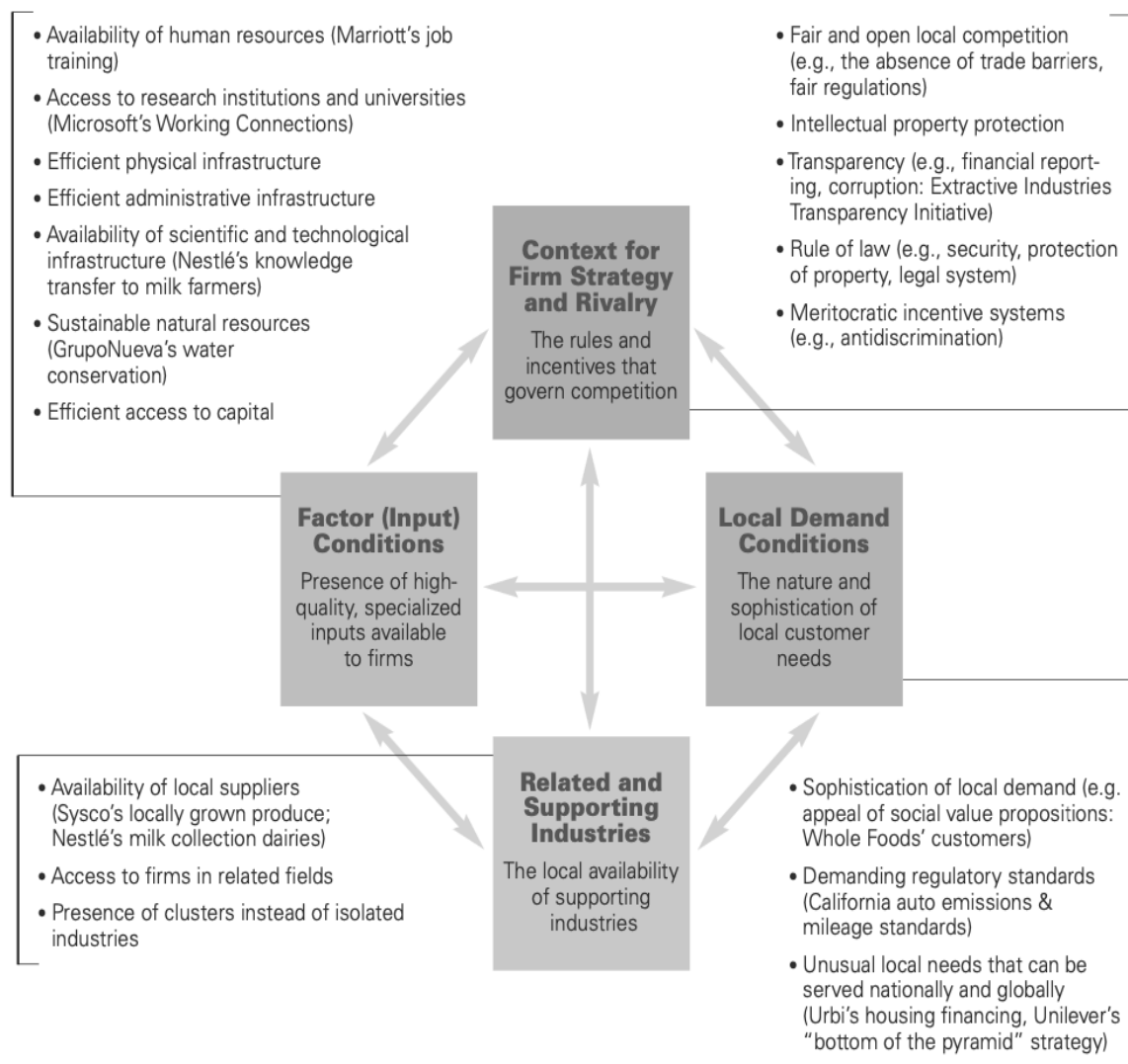


Figure 5.2 – Diamond framework outside-in linkages (Porter 1990)

Mainly the diamond framework suggests that we have four different potential linkages influencing companies starting from the society, namely (Porter 1990):

- The context governing competition among firms such as intellectual property regulations and entry barriers
- Local demand conditions which are in line with respect to buyers' customs and preferences and may vary from a place to the other
- Presence of firms within the same industry so as to form clusters and collaborations rather than having sole companies operating in that sector
- Input conditions which do have an impact on the quality of the inputs and as such on the final outcome but also on the availability of raw materials and infrastructures.

If on one side so far, we have been discussing about the very first problem characterizing the relationship occurring between businesses and society, on the other side we need also to analyze the second overarching issue connected with the development of CSR, being the fact that companies do not have to focus broadly on CSR goals, but they rather have to pick and choose the most suitable ones (Porter & Kramer 2006).

Among them we have three marquee issues being essentially the following ones (Porter & Kramer 2006):

- General social issues, being not significantly affected by the company's operations
- Value chain social impacts, being instead significantly affected by the company's operations all throughout its business
- Social dimensions impacts, which are instead responsible for affecting the competitiveness of the companies in the place where it operates.

Although we are theoretically able to classify the different arrays of issues intertwined with CSR that our companies might adopt, we need to clarify the fact that the category within which a given issue belongs does depend on the specific company's typology, in fact while carbon emission might be an issue falling in the boundaries of general social issues for a company belonging to the banking industry, if we pick up a firm operating into the transportation industry, it will perceive it as a value chain social issue (Porter & Kramer 2006).

Therefore, corporations need to understand that while applying the principles of CSR, they are not called to solve all the problems created by all the industries, instead they have to choose those issues they are able to solve with their own resources and capabilities in order not to add up excessive costs to their accounting list, but so that solving those issues leads up to a sort of shared value both for the company and for the society (Porter & Kramer 2006). Only in this way CSR issues will be seen more as an innovation and growing opportunity rather than a cost; hence companies will completely neglect their thoughts about potentially moving toward greenwashing and will definitely adopt CSR issues given their more sustainable feature (Porter & Kramer 2006).

From a practical standpoint though, companies in order to apply successful internal environmental policies should essentially follow the next pieces of advice (Porter & van der Linde 1995):

- They should stop hiring external consultants regulating their internal environmental moves, and instead finally integrate environmental aspects within their corporate strategy

- Given that one of the main problems preventing companies to success in this sense is essentially ignorance about the real pollutants that are emitted both directly and indirectly, hence a precise system of measurements would help the company in order to reach much sooner its objectives. Moreover, doing so would contribute to the calculation of greenwashing measurement we introduced in chapter 3
- Companies should start looking into the real cost of pollution including toxic materials, disposals, scraps that instead could be reduced if they would better invest in new ways of transforming it
- In order to get a better overview, companies should finally include in the computation of environmental-damaging outputs not only the ones deriving from the production, but also the ones emitted by the costumers utilizing those products or services.

## **5.2. Political implications**

### ***5.2.1 From the static to the dynamic view of environmental regulation***

As discussed by the end of the previous chapter, a major setback for companies when dealing with environmental or green investments is that generally it is presented as a choice to be made between two different options. While the first can be presented as the option of being in compliance with green regulation, hence increasing costs so as to clinch CSR purposes, the second can be placed more as a sort of business-view alternative within which companies do not comply with environmental regulation due to the fact that the higher costs deriving would lead up to losing their attractiveness within the boundaries of their competitive environment (Porter & van der Linde 1995).

However, what we need to point out is essentially that this typology of thoughts is indeed widespread from a kind of regulation which is perceived as static due to the fact that it perceives the competitive environment formed up by customers, companies, regulators as never changing, hence rising costs would be the solution (Porter & van der Linde 1995).

Conversely, governments should essentially convey a dynamic image of regulations whose compliance would lead companies to lower costs, better usage of their resources in terms of efficiency, and though offset of those costs that are initially linked to an initial green investment (Porter & van der Linde 1995).

Therefore, we can understand that - although as we have seen in chapter 4 it is the role played by the companies in choosing the right kind of investments that ultimately define whether

or not going green is a successful strategy for that company - governments play a fundamental role while choosing their policies and regulations concerning company's green investments. Hence, finally we can end up saying that another determinant of greenwashing besides the whole array of determinants we have been analyzing so far comes from the government's behavior in terms of choice of green policies.

### ***5.2.2 The need of a dynamic regulation: the push-pull effect***

As we have just discussed, a government opting for dynamic form of environmental regulation needs to show to corporations how the costs and efforts of achieving CSR goals is essentially compensated by the benefits in terms of both innovation and better competitive environment deriving.

Spontaneously we might argue that as achieving CSR goals by part of the companies brings about innovation and a better resource usage, we might also not need the presence of a regulation policy since companies would naturally follow the aforementioned path of improvement. However, we need to admit that it is false to claim so due to the fact that without a regulatory push-pull effect, companies would not opt for reaching their CSR goals and in particular the following bunch of reasons can be enlisted out of the several motivations leading up to arguing regulation is needed, namely (Porter & van der Linde 1995):

- Creation of pressure spurring companies at improving and innovating so as to overcome the challenges of organizational inertia for which a company does not generate new kinds of knowledge but rather it is mainly focused on the knowledge that has already been created
- Spurring companies at sticking to their CSR goals in all those cases in which seeing the benefits of this kind of investments takes longer due to learning economies
- Guide new product and process innovations to be effectively environmentally friendly
- Improve the demand for environmental solutions as opposite with respect to pollution so as to raise the perception of this problem as a very costly one
- Get an easier transition to this kind of investments by passing the message that firms which are not willing to embark on these steps cannot gain positions within the boundaries of competition.

Therefore, the bottom line is essentially that regulation is indeed needed, but as mentioned earlier it does not have to be a sort of “bad regulation” which can be identified with the static mindset. Conversely, it must be a “good regulation”, hence a dynamic regulation spurring

companies at doing so as to put in practice a resource-productivity model and not at taking defense against the potential consequences of not being in compliance with the rules.

### ***5.2.3. The main differences between pollution-control and resource-productivity policies***

So far, we have come to the point where we ultimately got that government regulation within the boundaries of the CSR goals is indeed needed, and in particular corporations need a sort of dynamic approach rather than a static one, hence we will now try to better characterize the difference among them.

Whenever we mention what we labeled as bad regulations, we need to stress out the fact that their strictness generally focuses on cleanup rather than prevention, hence the main outcomes led by this model are the following (Porter & van der Linde 1995):

- standard specific technologies requirements, which are demanded to companies in order to be in compliance with regulation
- short unrealistic compliance deadlines within which achieving the policy compliance
- discouragement of risk-taking behavior so as to be on the safe side in terms of timing
- government inflexibility to enforcement.

Needless to say, these outcomes do not bring about a general improvement in the competitiveness scenario, but rather they damage it, induce a general sense of scaredness among firms, and do not finally lead up to either innovation or improvements of any kind. If we want to be more precise, we can end up saying that these types of policy generally guide companies to the choice of adopting those innovations we labeled as externality reduction investments (ER) that by definition are not able to offset the costs sustained to go green.

As opposite to pollution-control approaches, whenever we move onto resource-productivity policies, we need to highlight the fact that they can take the competitive environment to the next level, improve breakthroughs, and favor technological innovation (Porter & van der Linde, 1995). This crystal-clear difference between the two distinguished approaches is straightforwardly visible if one picks the pulp-and-paper industry and the two different policies that have been applied by the American and Scandinavian policymakers. While the former used to declare very tight deadlines and short-term emissions goals though inducing companies to heavily invest in secondary treatment systems, the latter enforced a much less tight regulation at the very beginning while preannouncing to corporations that it would

become a much less flexible regulation in the course of the following period, so as to give the time to companies to find innovative solutions and at the same time induce changes within the boundaries of the product lifecycle (Porter & van der Linde 1995).

#### ***5.2.4 Shaping the “good environmentally-friendly policy”***

In order for policymakers to finally establish a sort of good environmental policy intended as resource-productivity policy, which is though based on a dynamic approach, institutions should be following the next approaches (Porter & van der Linde 1995):

- The ultimate scope of the policy should not be on the kind of technology to be used, but rather on the very outcome triggered by that specific technology. This will unavoidably lead to the conclusion that policymakers need to spur companies at looking for ex-ante solutions and not ex-post ones, in a way to increase their competencies and though reach innovation
- Ultimately put in place a stringent kind of regulation rather than a lax one due to the fact that if the latter was applied, then companies would opt for secondary treatments rather than truly innovative approaches. However, although a strong regulation has to be enforced, a long-term vision needs to be applied so as to reach innovative solutions and not quick ones. Moreover, although the stringency characterizing that specific policy, benefits and incentives need to be provided to corporations showing commitment and reaching outcomes
- Harmonization and unique reference to worldwide regulation in that sector needs to be reached, that is the reason why we do need to introduce unique ways to define what we mean by green investments and what instead we define greenwashing
- Industries' involvement into the policy making process due to the fact that as we said when analyzing the relationship between companies and green investments, every company and more specifically industry has its own issues to be solved.

#### ***5.2.5 The inducement effect of good environmental policies and beyond***

The rationale behind the support of the theory we just exposed and according to which we have that the more the environmental policy is a stringent resource-productivity policy, the more the positive effect on competition and environmental results, flows from the so-called inducement effect proposed by Hicks (1932) according to which the more stringent the regulatory framework, the higher the polluting cost will be, hence environmental innovation is needed in order to drive them down. Putting it in another way, we can point out that a

stringent well-organized regulatory framework, will engender the demand for green technologies to surge, hence companies will meet this surging demand by simply generating green innovations, that in turn will have a positive effect on the productivity of the adopters. On the basis of this theory, the work of Colombelli and other authors (2021) – that has already been introduced in Chapter 4 - hypothesized that a stringent regulatory framework is able to exert a positive effect not only on the firm's productivity, but also on its market performance as this investment would be positively evaluated by the stock market.

In order to investigate so starting from the framework we presented in Chapter 4, the authors introduced another independent variable known as the environmental policy stringency (EPS) measuring market and non-market based environmental policies from 0 up to 6, where 0 corresponds to the lowest level of stringency and 6 to the highest (OECD 2022). By so doing, the very first result that the research showed has been that there is indeed a positive correlation between EPS and market value of the company, hence we can conclude saying that the higher the stringency, the better the market value (Colombelli et al. 2021). Afterwards, and retaking into consideration the positive effect exerted by green patents on the companies' stock performance, they combined together the degree of stringency with the level of green patents and finally found out that whenever green patents are perceived as a response to a stringent regulatory framework, the market appreciates them much more than when they are not generated as a response to environmental policies (Colombelli et al. 2021). Finally, we can end up saying that within the boundaries of CSR not only regulation is needed, but in order to be effective it has to be based on resource-productive policies with a high degree of stringency: only in this way companies will be happily implement them and they will not fall in the trap of greenwashing as a natural alternative due to its positive impact on both resource usage and stock market.

### **5.3. Practical recommendations to companies, policymakers, and NGOs**

Till now, after the presentation of the concepts belonging to Sustainable Finance (Chapter 1) and the introduction of a major problem being present in that field and known as Greenwashing (Chapter 2), we finally reached the conclusion that in order to have a more practical view on the argument, measurement systems need to be discussed, hence we did so in Chapter 3.



Finally, after investigating in Chapter 4, from a more empirical perspective, whether there are any tangible real incentives for companies to greenwash and their context, in Chapter 5 we ultimately propose a more theoretical approach that both companies and governments should adopt in order to integrate both business and social goals.

Therefore - in order to switch from theory to practice, in this last part of the work - on the basis of what has already been exposed and analyzed, we give practical recommendations to both managers, policymakers and NGOs so as to get rid of greenwashing procedures.

In particular, we do believe that both policymakers, managers, and NGOs need to chase after the following achievements (Delmas & Burbano 2011):

- Enhance the level of transparency and clearness of a company's environmental performance not only through mandatory disclosures, but also through the endorsement of voluntary disclosures and ratings as we observed in Chapter 3
- Increase and spread knowledge about greenwashing by both spilling out greenwashing incidents, and by finally reducing regulatory uncertainty
- Better align firm structures, processes, and incentives through an improved communication of environmental decisions, ethical training of employees on CSR issues, and employees' incentives system.

### ***5.3.1. Enhancement of company's disclosure of environmental performance***

The very first recommendation we are able to provide in order to slow down the greenwashing movement consists of enhancing company's disclosures about its environmental performance through both mandate and voluntary disclosures (Delmas & Burbano, 2011).

If we pick the former kind of disclosure, we can imagine how here an active role is played not only by policymakers, but also NGOs. In fact, from the political slant imposing mandatory disclosure of environmental indicators and managerial practices would enter the boundaries of tough regulation – as opposite to lax regulation – improve reporting procedures (Frost 2007), and finally decrease greenwashing (Delmas & Burbano 2011). On the other side, from the perspective of NGOs, they also play a pivotal role due to the fact that having mandatory regulation without verifying the righteousness of the pieces of information being submitted by the companies would only enhance the likelihood of awful environmental procedures, hence we do need to put in practice a mechanism of verification and auditing of the pieces of information provided (Delmas & Burbano 2011). In this way

NGOs would also be empowered with the challenge of disclosing compliant and bad performers belonging to a given industry (Delmas & Burbano 2011).

Concerning the latter kind of disclosure, namely the voluntary one, we can say that its overarching role does depend on the behavior of both policymakers, NGOs, and ultimately managers. In fact, while governmental and non-governmental organizations could promote it by working for the unification of codes, indexes and pieces of information - as for example it has been investigated in Chapter 3 when introducing the ESG risk ratings by Sustainalytics - managers could opt for disclosing additional pieces of information while collaborating with other companies, government bodies, and NGOs so as to commonly share information in the direction of preventing greenwashing practices (Delmas & Burbano 2011).

### ***5.3.2. Sensibilization toward greenwashing***

Another important recommendation we can draw from our analysis is that both governmental organizations and NGOs are determinant players in sensibilizing corporations to the threatening issue of greenwashing. In particular, two actions should be implemented in this context, namely: spread information about greenwashing incidents, and reduce regulatory uncertainty. With respect to the former argument, NGOs are the main players due to the fact that their goal within the boundaries of this achievement is to come together and share unique information with the aim at spreading certainty among customers and eliminating the feeling of confusion that customers might experience in front of several different pieces of news (Delmas & Burbano, 2011).

In this way, environmental investors would end up being better informed and as a consequence brown companies might think twice before opting for wrongdoing behaviors. With respect to the concept of regulatory uncertainty instead we need to remark the government's role which must be aimed at both unequivocally measuring greenwashing and clearly dictating what can be considered as corporate-socially responsible (Delmas & Burbano 2011). That is the main reason why in chapter 3, we did introduce several ways that might be a gamechanger in this sense.

### ***5.3.3. Alignment of firm's structures, processes, and incentives***

Since the shift toward green procedures and investments might be new to a company, it is important that managers align the whole structure, process, and people with those goals.

In particular, organizations might put in place the following three actions (Delmas & Burbano 2011):

- Improve the level of communication within the firm so as to finally avoid greenwashing procedures generated by miscommunication problems, so that the company will also be able to overcome the problems of slowly responding to environmental changes engendered by organizational inertia
- Training of employees to the CSR goals that need to be achieved by the company, in such a way that everybody in the company from C-level managers to blue collars pursue the same objectives
- Promotions and incentives to employees acting following the environmental goals and waving greenwashing practices.

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