CHAPTER 2

Self-Consciousness and Awareness as Adaptation Enablers

Massimo Catizone

Introduction

Large international corporations manage a vast amount of capital and assets. As a result, corporations are in a position to affect the environment and the value of natural capital. Considering the environment as a free and not finite resource is fundamentally incorrect. There is a growing consensus that any firm that is failing to implement the necessary adaptation strategies, consumes and erodes natural capital without an effective mitigation strategy, would do so at the expense of other firms and households. In this case, when remediation is possible, the remediation costs would have to be borne by other stakeholders.

Directing capital towards adaptation projects should be viewed as an opportunity for all stakeholders, not just corporations. As argued by the Global Commission on Adaptation investing in adaptation can provide

M. Catizone (✉)
Research Centre of Applied Economics, Catholic University of the Sacred Heart, Milan, Italy

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a triple dividend: loss avoidance, economic benefits and social and environmental benefits. Not investing in adaptation should be considered as an active investment decision. The consequences of such a decision are difficult to predict and quantify, but it is almost certain that such consequences will negatively affect the value of stakeholders' capital over time. Early warning systems, for example, save lives and assets worth many times their cost.

Due to the role of corporations and the magnitude of the size of the assets that are under the influence of their choices and decisions, it appears legitimate to argue that corporations have a responsibility and, more importantly, an interest, in implementing business strategies capable of preserving natural capital, monitoring and mitigating, through constantly refined risk management strategies and solutions, the impact of climate change.

The question then arises as to if and how corporations can and should go about identifying and implementing sustainable business strategies. Also, the parameters and reference points to be used by corporations to assess whether or not their strategies are suitable to achieve their objectives, generate value for all stakeholders and mitigate climate change-related risks should be identified. In this respect, two macro-areas should be considered.

First, risk identification and disclosure. As of today, disclosure of climate-related risks is, especially for smaller firms, largely voluntary and as a result, available data is scarce and, in most cases, inadequate to enable investors to compare corporations from the same sector and assess relative resilience to climate-related shocks.

Second, the mission of the corporation. As the stakeholders' base and its expectations change over time, the mission of the corporation should predict and acknowledge such changes and adjust accordingly. For example, the potential benefits of digitalization and new technologies as enablers of a green transition and as tools for climate change risk mitigation should be fully exploited. It has been argued (Patel et al., 2010) that machine learning algorithms can be successfully used to predict climate change and in the context of conservation planning by locating habitats of wildlife and predicting future sites where wildlife would be likely to relocate based on scientifically backed climate change assumptions.

Old Demons and New Challenges: Sustainability and Beyond

Over the years, a number of scholars and institutions have attempted to define the concept of sustainability. The UN World Commission on Environment and Development (World Commission, 1987) defined sustainable development as a form of development "that meets the needs of the present without compromising the ability of future generations to meet their own needs". A sustainable development should therefore enable the biosphere and human civilization to coexist in the long term. Sustainable development is by no means a new challenge. For example, it has been argued (Harper, 2017) that the Romans built an interconnected, urbanized empire on the fringes of the tropics with tendrils creeping across the known world. In an unintended conspiracy with nature, the Romans created a disease ecology that unleashed the latent power of pathogen evolution. The Romans were soon engulfed by the overwhelming force of what we would today call emerging infectious diseases. The end of the Roman empire then is a story in which humanity and the environment cannot be separated, a stark reminder of the magnitude of the impact that nature and climate changes can have on our ways of life. A similar event, but on a much more reduced scale happened in 2016 and 2017 when public fears over the Zika virus eroded hotel tax collections across the state of Florida and other international markets. Other consequences included costs associated with treating birth defects among features and infants of US women with evidence of possible Zika Virus infection during pregnancies. The World Bank estimated that the economic costs of Ebola in West Africa due to disruptions in travel and trade exceeded half a billion dollars. An estimate published in Health Economics placed the cost of lost tourism revenue in Mexico during the 2009 Swine Flu outbreak at $2.8 billion. The full extent of the long-term impact on global GDP, on demographics and our ways of life of the 2020 coronavirus outbreak is yet to be determined. According to a report from OECD the scale of the estimated decline in the level of output is such that it is equivalent, in the absence of offsetting factors—to an annual decline in annual GDP growth of up to 2 percentage points for each month that the strict containment measures continue. Due to the size of the expected contraction in global output, there is a risk that—at least in the short to medium term—governments sustainability strategies may be relaxed. Because of the global economic recession and the

imminent threat posed by it, accelerating economic recovery is viewed by many as a priority not compatible with the implementation of climate-related policies. It cannot be excluded that, due to the lockdowns and other containment measures imposed by many governments, virtually all countries, including those that have been less proactive in responding to the challenges arising from climate change, will meet their CO_2 reduction targets. Containment measures resulting in a reduced entitlement to enjoy certain rights that in most jurisdictions are perceived as fundamental are only acceptable for a limited period of time and in exceptional circumstances. Not surprisingly there is a consensus that these measures should not be regarded as sustainable long-term solutions for tackling climate change (Fig. 2.1).

The 2020 pandemic is emphasizing once again the magnitude of the challenge deriving from climate change, which has been eloquently defined—Bodansky et al. (2017)—as planetary in scope, and because of its potentially irreversible consequences intergenerational in its impact. Again, we witnessed the close relation between loss of biodiversity and

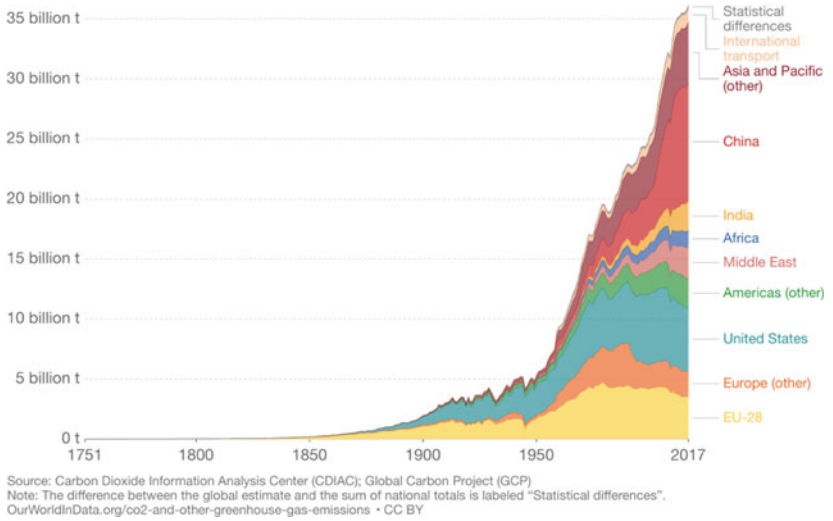

Fig. 2.1 Annual total CO_2 emission, by world region, 1751–2017 (*Note* The difference between the global estimate and the sum of national totals is labelled "Statistical differences". *Source* Carbon Dioxide Information Analysis Center [CDIAC]; Global Carbon Project [GCP])

disease outbreaks and that the recovery will require *ad hoc* solutions. In April 2020 the EU Technical Expert Group on Sustainable Finance issued a statement emphasizing that sustainable recovery from the COVID-19 pandemic requires the right tools which, according to such statement are to be found in the following EU documents: (a) Sustainable finance taxonomy, (b) Green Bond standards and (c) Paris aligned and climate transaction benchmarks. These tools encourage substantial contributions to environmental and social objectives, also from corporates and financial actors that are not yet fully aligned with environmental goals.

The pandemic seems to be advocating the need for a bold shift towards integrated global macro strategies, a new role for governments and law makers, significant changes in how we consume goods, interact with our peers, protect our personal data and possibly even a reconfiguration of the ranking of our basic rights. Put simply, the financial and medical support that governments are providing during the pandemic may ultimately be subject to conditions intended to reduce the risks of a second wave of infections or the spread of a new virus. The global GDP contraction caused by the pandemic was a reminder of the importance of social capital and, as argued by Kwon and Arenius (2010), of social entrepreneurship and that the current equilibrium between government, markets and social capital may benefit from some rebalancing.

These are not trivial challenges and it should not be taken for granted that commonly accepted principles, concepts and solutions can be relied upon to overcome such challenges. History has shown us that crisis are defining moments leading to the emergence of new leaders and the acceleration of innovation.

Arguably, a modern concept of sustainability should go beyond the limits of the mere coexistence of human civilization and nature and encompass the relationships between nations. There is a consensus that environmental factors are often important drivers behind conflicts. Nations have often fought to assert or resist control over raw materials, energy supplies, river, land, sea passages and other key environmental resources. Such conflicts are likely to increase as these resources become scarcer, the human population becomes larger and competition for resources increases. Environmental stress can thus be an important part of the web of causalities associated with any conflict and can in some cases be catalytic. Extreme weather events and pandemics whether or not anthropogenic can trigger or accelerate migration flows and cause international political instability.

Is the GDP of nations with a greener and more circular economy going to be less vulnerable to international natural-capital-dependent tensions and conflicts? Would a reduced reliance on finite resources reduce the probability of conflicts? It has been pointed out that better environmental policies reduce the likelihood of conflicts and that a circular economy, almost by construction, would be conducive to peace and prosperity (Behrens, 2016; Caruso et al., 2016).

These questions are extremely complex, and the answers are going to be very articulated, but there is growing evidence suggesting that countries that are less dependent on oil imports would be less affected by large scale conflicts involving oil-producing countries. When in January 2020 US President Donald Trump announced the death of Qassem Solimani, oil prices increased more than 3%, but soon thereafter reverted to previous levels. The initial price movement was driven by a number of factors including investors' concerns on the magnitude of Iran's possible retaliation. Concerns were subsequently eased by a number of political and financial factors. The relatively limited reliance of the US economy on oil imports and the ability of US corporations to access alternative sources of energy supply and deliver alternative innovative and efficient energy production solutions were among the main reasons that lead to a rapid price reversion.

This seems to suggest that an economy that is less reliant on the import of fossil fuels and is able to derive its energy from sustainable, renewable and eco-friendly sources would be less vulnerable to the consequences that international tensions and conflicts may have on the prices of fossil fuels. Furthermore, commercial tensions may arise between neighbouring countries with significantly different regulations and limits applying to CO_2 emissions. The president of the European Commission in her 2020 speech at Davos warned China that a Carbon Import Tax may be applied to imports of Chinese goods should China fail to implement a credible CO_2 emission reduction strategy. More importantly, it may be highlighted that an economy that is less reliant on the supply of finite energy, greener, more circular more sustainable and characterized by a good governance system, would be more likely to be conducive to peace, stability and value creation than an economy that remains more fossil fuel dependent and less willing to implement strategies capable of mitigating the impact of climate change (Caruso et al., 2016). Typically, resources abundance and resource dependence (Lashitew & Werker, 2020) have a different effect on development. Resource abundance tends to have a positive direct impact on

development. Resource dependence has a stronger indirect impact on human capital development. It has also been observed (San-Akca et al., 2020) that there is a link between energy policies and conflicts intervention. Furthermore, it has been argued (Maniruzzaman & Al-Saleem, 2017) that at a local level suboptimal governance mechanisms and uncertainty surrounding the legal framework applying to the exploitation of fossil fuels is a source of legal risk, internal friction and a factor negatively affecting sustainable development.

What is the taxonomy of a sustainable economy? What constitutes a sustainable fishing policy? What is a sustainable water management strategy? What is sustainable deforestation? What is a sustainable immigration policy? What does a sustainable banking industry look like?

Defining sustainability is a largely theoretical exercise based on mostly arbitrary assumptions. There is a growing body of literature suggesting that it should not be taken for granted that sustainability is the correct tool for calibrating our response to the challenges posed by climate change. Some scholars are going as far as arguing that the objective of environmental policies should not be sustainability, but resilience. They state that defining sustainability is a difficult, largely unachievable and futile goal. Furthermore, it has been observed that one of the main weaknesses of sustainability is that it erroneously assumes that "anthropogenic changes are non-transformative and hence (generally) reversible". There is now a consensus that at least some of the anthropogenic changes to the environment are not reversible. Some scholars are therefore arguing that the priority of any response to the challenges posed by climate change should be the creation of an ecosystem that is able to absorb the shocks deriving from the inevitable and irreversible climate changes. It can be underlined that the merits of a resilient ecosystem are unquestionable. Any solution to the challenges posed by climate change should therefore ultimately be aimed at creating a sustainable environment characterized by a durable equilibrium among all stakeholders and their interests.

Sustainability and resilience do not appear to be mutually exclusive. It is difficult to imagine a sustainable ecosystem that has zero or limited shock absorption capacity. It could therefore be argued that resilience is an essential pre-condition for sustainability. It may also be argued that the importance of finding a consensus on the definition of sustainability, sustainable investment, sustainable economy, sustainable governance, etc., should not be overemphasized.

What seems to deserve more attention is how the transition from the *status quo* to a more resilient and stable long-term equilibrium between stakeholders interest can be achieved.

The main common thread between sustainability theories and resilience theories are the need for adaptation. In order to respond to the climate change challenges, virtually any ecosystem or part of such ecosystem need to adapt and evolve. As a consequence, it appears legitimate to envision that the currently prevailing definition of corporate mission, agency theory and a number of other commonly accepted economic theories and principles may have to be reconsidered or adjusted considering the new findings on the relevance of adaptation, the constitutional elements of corporations, their priorities and purposes.

The Conscious Corporation

In law, a legal person is any person or entity that can do the things an everyday person can usually do in law such as enter into contracts, sue and be sued, own property, etc. Smith (1928) argues that to be a legal person is to be the subject of rights and duties. To confer legal rights or to impose legal duties, therefore, is to confer legal personality.

Some of the main defining features of a natural person are self-consciousness and consciousness. Consciousness generally involves the perception of the physical environment based on knowledge and experience. Self-consciousness involves the perception of being physically distinct from, but part of, a surrounding ecosystem. Consciousness and self-consciousness would therefore enable a corporation to define its mission, its role within a particular ecosystem and adjust them as the objectives and priorities of the ecosystem change.

Self-consciousness would enable the corporation to engage with all stakeholders with the purpose of creating consensus and demonstrating the alignment of its interest with the interest of the ecosystem of which it is an active stakeholder. Engagement is essential as it is the continuous process that allows corporations to interact with their stakeholders. In the absence of such a process corporates become disconnected from their stakeholders and lose value. The purpose of any engagement between the corporation and its stakeholders should have multiple dimensions, but it should be primarily directed at demonstrating how the corporation is able to serve and create value and remain relevant for the entire stakeholder's base in the long term. A purposeful engagement is not possible without

self-consciousness. Without knowledge and awareness, the corporation would lack the necessary tools to recognize its role within the ecosystem, capture changes in such ecosystem, in stakeholders aspirations and expectations and ultimately would be unable to evolve by dynamically adjusting its business and strategies. In this context, corporate governance plays an essential role. It is thanks to its corporate governance mechanisms that a corporation can develop its self-consciousness and engage with purpose and knowledge with its stakeholder's base.

Corporate consciousness enhanced by knowledge and purpose appears to be a very powerful and effective key to unlocking the complexities and managing the challenges associated with climate change.

Corporations that will be able to develop self-consciousness and engage with purpose will be ideally positioned to evolve, create value for all stakeholders, adapt and attract fresh finance flows.

The ability to adapt existing business models or existing products with the view to transforming the challenges deriving from climate change into business opportunities is critical. In Europe, for example, a growing group of banks has started granting mortgage loans secured against energy-efficient properties. Furthermore, the same group of banks is arguing that loans backed by energy-efficient properties have a lower credit risk compared to loans backed by traditional properties. The rationale for this argument is twofold. First, as the running costs for energy-efficient properties are lower, the borrowers would be more resilient, should any event with a negative impact on their income occur. Second, the price of energy-efficient properties tends to be more stable compared to traditional properties. The ultimate objective of this exercise is to obtain from the regulators a privileged regulatory treatment, in the form of a lower risk weight, for mortgage loans secured against energy-efficient properties. An initial temporary pilot project was successfully launched in February 2020 by the Hungarian Central Bank. Should a favourable view be taken at the European level, this could become an example of conscious corporations actively engaging with the climate change ecosystem for the benefit of all its stakeholders. One of the main obstacles to this scheme being rolled out across Europe is the lack of reliable data on the performance of loans backed by energy-efficient properties.

One of the main challenges that the modern conscious corporation is facing is its strategic positioning relative to the ecosystem within which it is operating. To a large extent, in the case of the ecosystem required to manage climate change, which we will refer to going forward as

the Climate Change Ecosystem, the challenge derives primarily from the complexity of the issues at stake, the large quantity of stakeholders involved and the variety of interests, objectives and priorities of such stakeholders.

Governing the Climate Change Ecosystem is therefore essential in order to enable the conscious corporation, but also the other stakeholders, to function and contribute to the pursuit of the objectives of the ecosystem.

In the following paragraphs, we will discuss in more details the crucial role of disclosure in the management of the challenges deriving from climate change, considering some approaches that could be suitable to manage its complexities.

Managing Complexity in the Climate Change Ecosystem

Governing the Climate Change Ecosystem is a challenging exercise. This is mainly due to the inherent complexities of the task, insufficient scientific knowledge, varying stakeholders' capacity to address climate change challenges, but also to some institutional inertia Meadowcroft (2009).

There is no hard evidence suggesting that in order to govern such ecosystem a particular form of governance would be more effective than others. Given the complexity of the task and the magnitude of the repercussions that the wrong choice may have on our ability to manage climate change, it appears preferable to rely on techniques and solutions commonly used to manage complex systems. A subsequent adjustment may be required or advisable in order to accommodate the specificities of the Climate Change Ecosystem, its objectives and priorities.

The choice should therefore be driven by a simple and pragmatic analysis. The most suitable governance model is therefore the model that is more likely to successfully address the objectives and priorities of the ecosystem it is intended to govern. Any approach adopted to govern an ecosystem should therefore enable innovation, high performance and most importantly system adaptability. Scientific innovation is essential to identify and implement the technical solutions underpinning a sustainable and climate change resilient economy. Without scientific innovation, the impact of capital would most likely remain below potential. Capital is an essential enabler of innovation as without intelligent capital, scientific innovation is unlikely to progress and financial products may not be able

to unlock the opportunities embedded in climate change. High performance is essential as all stakeholders should be able to communicate and interact with the view to achieving the best possible results within the shortest timeframe. And here is where adaptability, one of the key components of the ecosystem, comes into play. As we have pointed out before, the Climate Change Ecosystem is dynamic as it must react to new findings, new events, new knowledge and climate change itself, which, to a large extent is inevitable. Like the conscious corporation, the ecosystem should be able to recognize and acknowledge changes in environmental conditions, in stakeholders' priorities and objectives and adapt quickly in order to remain high performing and therefore able to serve its purpose over time.

Modularity governance and nodal governance-based solutions are often used to manage large and complex systems. Some of such solutions may be used to govern the Climate Change Ecosystem as they develop from the acknowledgement that governance is characterized by a plurality of actors forming more or less interconnected governance networks (Burris et al., 2005) argue that governance members of an ecosystem develop forms of governance as a strategic adaptation to complexity. They highlight that governance in complex systems is organized in nodes—institutions with a set of technologies, mentalities and resources—that mobilize the knowledge and capacity of members to manage the course of events. Nodes are points on networks and networks are a prime means through which nodes exert influence. This governance framework appears to be suitable to govern the Climate Change Ecosystem as each node may represent one group of stakeholders. Modularity is also used to manage complex systems. There is however some evidence suggesting that excessive levels of modularity may jeopardize system adaptability.

In light of the nature and ultimate objective of the Climate Change Ecosystem, it can be stated that any governance solution which may in any way negatively affect the ability of the ecosystem to adapt would not be the optimal choice. Therefore, should a compromise between performance and adaptability be inevitable, adaptability should prevail at the expense of performance. Ability to adapt or the lack of adaptation skills (Guay et al., 2015) are not only pre-condition for firm performance, but also CEOs longevity hence stability.

Consequently, we remain agnostic with respect to the most suitable form of governance, provided that, the governance mechanisms chosen by the ecosystem enable it to adapt swiftly. The ecosystem should adapt

to the changing needs of its stakeholders, but stakeholders should also adapt and adjust the way in which they conduct their business in order to fit into the ecosystem and accommodate the objectives and requirements of the ecosystem and other stakeholders. Adaptation is therefore an essential condition for the Climate Change Ecosystem to prosper, but also a condition for individual organizations to become and remain part of the ecosystem.

The challenges that the Climate Change Ecosystem is facing are not new, however, the ecosystem itself is, in many respects, in its infancy. The ecosystem, through its governance mechanisms, should learn how to identify and manage such challenges. Failure to do so could negatively affect the efficiency and the growth pattern of the ecosystem. In this respect there are three main areas of risk that tend to be underestimated and that deserve to be monitored closely: (α) excessive regulatory fragmentation; (β) failure to assess and quantify correctly the ramifications of the measures that are implemented to respond to specific policy requirements and, last but not least, (γ) the risk that incentives presented as forms of legitimate support for sustainable economic activities constitute in reality unlawful state aid or other forms of subsidies that could distort competition within the ecosystem.

Excessive regulatory fragmentation. The rules governing the Climate Change Ecosystem derive from different organizations and a variety of initiatives. Some are purely domestic, others are intended to apply regionally, like the European Commission's Action Plan on Financing Sustainable Growth or internationally, like the United Nations initiatives. Some decree of regulatory and supervisory fragmentation is inevitable and to some extent potentially beneficial for an ecosystem as complex as the Climate Change Ecosystem. However, excessive supervisory and regulatory fragmentation and a lack of harmonization should be avoided as they could lead to operational inefficiencies, duplication of costs and ultimately may affect the ability of the ecosystem to function efficiently.

The possibility that the repercussions and consequences on the ecosystem of a specific economic activity may not be fully appreciated is also a risk. In order to mitigate this risk, the Technical Expert Group proposed a "do no harm" test. In order to determine the environmental sustainability of economic activity, such activity should meet at least one policy objective, but also it should not have a direct or indirect negative

impact on other policy objectives. This appears to be a relatively straightforward test, but meeting its requirements is expected to be excruciatingly difficult.

It can be argued that incentives aimed at accelerating, especially in the early phases, the growth of an ecosystem are beneficial. Furthermore, providing supports and incentives is an important component of the role of governments and lawmakers in the Climate Change Ecosystem. However, the ultimate objective is for the ecosystem to be economically and financially viable, sustainable, resilient, fair and inclusive. Therefore, any form of incentive contravening competition rules or providing undue benefits to a particular group of stakeholders at the expenses of the others should be inhibited. It should be recognized that drawing a line between genuine green incentives and sophisticated forms of state aid is a complex exercise, which is exactly why it is argued that this is a risk that deserves ongoing monitoring.

An additional level of complexity derives from the fact that there is often an overlap between sectors that are considered strategic by governments, such as energy, construction, infrastructure or the housing market and sectors that are the subject matter of environmental social and governance policies. As a result, there appears to be a risk that specific measures may not be entirely implemented to support a transition to a more sustainable and resilient economy, but simply to advance a political agenda. ADAPTATION IN THE CLIMATE CHANGE ECOSYSTEM: RECONSIDERING THE CORPORATE MISSION AND THE DISCLOSURE OF CLIMATE CHANGE RELATED RISKS.

Since 2015, most of the countries that have signed up to the Paris Agreement have been adapting their existing legal and regulatory frameworks in order to encourage new capital to be deployed against initiatives that are instrumental to the achievement of its the main long-term purposes objectives of the Paris Agreement.

The Paris Agreement is intended to enhance and implement the objectives of the United Nations Framework Convention on Climate Change, adopted in New York on 9 May 1992, by, according to Article 2 thereof: (a) holding the increase in global average temperature to well below 2C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5C above pre-industrial levels (…); (b) increasing the ability to adapt to the adverse impact of climate change (…); (c) making finance flows consistent with a pathway towards low greenhouse

gas emissions and climate-resilient development. The Paris Agreement is generally regarded as a turning point in the history of climate change and climate governance. In this respect, A. Savaresi (2016) argues that the Paris Agreement marks the beginning of a new season for climate governance as "*it adopts a collective long-term goal on climate change mitigation to be supported by efforts from all parties (…) and for the first time recognizes the role of non-state actors in addressing climate change, and raises the profile of adaptation, albeit only incrementally*".

In order to be successful, the Climate Change Ecosystem should succeed in directing fresh capital towards projects supporting a more sustainable and resilient economy. It should be recognized that capital can facilitate and accelerate adaptation. However, it should also be recognized that the need for adaptation is more fundamental for the corporation than just a tool for attracting new capital. The Climate Change Environment is dynamic in nature and evolving constantly. The failure of the corporation to adapt and to become more resilient to the shocks deriving from climate change could eventually lead to the downfall of the corporation itself. Adaptation, intended as an innovation driven by a chain of destructive events (Schumpeter, 1976), is therefore a condition for attracting fresh capital, but more importantly, for business continuity. As eloquently observed by Charles Darwin (1859), "*it is not the strongest of the species that survives, not the most intelligent that survives. It is the one that is the most adaptable to change*".

Adapting Is not an Option but a Condition for Survival

Failing to adapt would threaten a corporation competitiveness first and potentially its existence in the long term.

Investors are reconsidering their assessment of climate-related risks and are gradually demanding higher rewards for taking climate risk. The more sophisticated investors are already recalibrating their assumptions across all asset classes including those that historically have been perceived as less risky. For example, investors in US municipal bonds are now expecting to be reworded for the risk of suffering losses deriving from increasingly frequent extreme weather events such as floods and earthquakes and their negative impact on the ability of cities to fully and timely repay their debts.

Directing capital towards adaptation projects should be viewed not only as a challenge but also as an opportunity for all stakeholders, not just corporations.

Not investing in adaptation should be considered as an active business or investment decision. The consequences of such decisions are difficult to predict and quantify, but early evidence suggests that these choices will affect the value of stakeholders' capital over time. Early warning systems, climate-resilient infrastructure, for example, save lives and assets worth several times their cost. The cost and benefit analysis conducted in respect of some of the most eminent climate-resilient infrastructure projects seems to support this view. The Netherlands, with the closing off of the Southern Sea in 1901 and the Delta Works commenced in 1953 offer an interesting case study in flood risk and water management. The North Sea flood of 1953 alone claimed more than 1800 lives. Following the 1953 dramatic events, the Dutch Government built a network of dykes known as The Delta Project or Delta Works. At inception, the estimated cost of the works amounted to 7.3% of the then GDP of the Netherlands and not surprisingly justifying and authorizing the Delta Works was no trivial challenge for the government and policymakers. A century later, CBP Netherlands Bureau for Economic Policy Analysis published a review of the cost and benefit analysis conducted at the time in a report entitled Cost–benefit analysis for flood risk management and water governance in the Netherlands: an overview of one century (2017). According to the report, both costs and benefits were underestimated. Interestingly, the report also outlines the main technical and regulatory challenges posed by the project which by no means should be considered specific to water management, but should be regarded as obstacles to be overcome by any climate change related physical risk mitigation project. The report emphasizes, as confirmed by OECD (2011) that water policy in many countries is ineffective due to fragmentation of tasks between different parts of government and lack of technical and scientific capacity. The outcome of the report seems to support the thesis according to which choosing not to invest in climate change risk mitigation is not a real option. Furthermore, the report also emphasizes the importance of governance capable of managing complexity and that scientific and financial innovation are essential to successfully manage climate change related challenges and opportunities.

Due to the role of corporations and the magnitude of the size of the assets that are under the influence of their choices and decisions, it appears

legitimate to argue that corporations have a responsibility and, more importantly, an interest, in implementing business strategies capable of preserving natural capital, monitoring and mitigating, through constantly refined risk management strategies and solutions, the impact of climate change. Such strategies should also allow for corporates to adapt and make strategic and tactical decisions in response to the likely consequences of possible climate changes.

Climate changes are not easy to predict with accuracy and firms should assess the impact of climate change on their business based on risk pathways embedding the effects that climate change related risks are likely to have on their profitability and value over a time horizon that is consistent with the timeframe within which climate changes may have tangible effects. Different stakeholders have different time horizons and a long-term approach, especially among investors, is not widespread. As a result, corporations may be under pressure to pay dividends, institutional investors may be under pressure to outperform their peers or a benchmark in the short term and financial institutions may find long term lending penalizing from a regulatory capital management point of view. Therefore, there is a risk that in the absence of systemic governance capable of implementing incentives, rewards and sanctions creating an alignment of interest among stakeholders, short-termism may prevent or slow down the growth of sustainable finance initiatives.

The question then arises as to if and how corporations can enhance their ability to absorb shocks deriving from climate and identify and implement sustainable business strategies and what parameters and reference points should be used by corporations to assess whether or not their strategies are suitable to achieve their objectives, generate value for all stakeholders.

Furthermore, corporations should allow investors and other stakeholders to take an informed, data-based view on the effectiveness of the actions taken in order to take advantage of the opportunities and mitigate the risks deriving from climate change. In this respect, two macro-areas should be considered: risk identification and disclosure and corporate mission. As regards corporate mission, in the following paragraphs, we will discuss the merits of an adjustment to the traditional agency theory based on a concept of corporate mission that reflects the need for the conscious corporation to be a part of the Climate Change Ecosystem. In the next paragraph, we will discuss risk identification and disclosure.

Risk Identification and Disclosure

As of today, disclosure of climate-related risks is not compulsory for all market participants and as a result, available data is scarce and, in most cases, inadequate to enable investors to compare corporates from the same sector and assess relative resilience to climate-related shocks. Disclosure requirements should be determined with a view to meeting investors requirements, facilitating financial supervision and measuring the resilience of the economy against climate change related shocks. Investors requirements and expectations in respect of disclosure will largely depend on the usage that investors intend to make of the environmental, social and governance data and information. Such usage and the required level of granularity of such disclosure will ultimately depend on the investment strategy of each investor. For example, investors that use ESG data for screening purposes only are likely to be content with a lower level of detail and data granularity than investors that fully integrate ESG data in their investment analysis. Active investors will expect full quantitative disclosure, but will also require full visibility and direct participation in corporate governance matters.

In this respect, a survey conducted by Amel-Zadeh and Serafeim in 2018 provides some insight on why and how investors use reported ESG information. The outcome of the report suggests that the majority of investors use ESG because it is financially material to investment performance. A smaller cluster of investors considers ESG information because of growing client demand or formal clients' mandates. A residual group considers ESG information because they see it as their ethical responsibility. Finally, a small group of US investors do not use ESG information as they believe that this would violate their fiduciary duties towards their stakeholders. Climate change risks should be treated, when possible, like any other risk to which a corporation is exposed. Disclosure requirements should be determined in order to provide investors with a fair representation of the objectives, or lack of them, achieved by the disclosing entity. Disclosure should also enable investors to determine the relationship between financial data and environmental, social and governance data.

There is a growing body of literature research suggesting that the biggest challenge to using ESG data for investment decisions is data noise and the lack of comparability of reported information across firms. Lack of reporting standards, costs of gathering and analysing ESG data is also

often regarded as a major obstacle. One of the major negative consequences of the current status of the climate change risk disclosure is that as of today there is no well-defined and commonly agreed materiality test for disclosure of ESG factors. In many cases, it is the disclosing entity that independently decides what is material and should therefore be disclosed. A concept of materiality should be recognized and ideally arrived at based on the defining features of the "E", of the "S" and of the "G". More progress appears to have been made on the "E" and on the "G" than on the "S".

Defining the perimeter of the "S" disclosure seems to represent a growing challenge, due to its complexity and urgency.

The urgency arises from the fact that the social ramifications of investments appear to be particularly relevant for an increasingly large and active group of investors: women and millennials. Failing to address their expectations to learn how their capital contributes to human rights protection or how they contribute to the advancement of social objectives may result in significant amounts of capital being directed away from sustainable investments, or more precisely, investments that could be qualified as sustainable if a satisfactory disclosure of the "S" factors was provided. This task appears to be challenging for two main reasons. First, save for a growing, but yet relatively small, group of investors, mainstream investors have limited interest in "S" factors. Their interest tends to materialize only when such factors lead to short term costs that are easy to calculate. Such costs are most likely to occur when mismanagement of social issues result in damage to brand reputation, lawsuits, fines, workplace shutdowns or consumer protests. In this respect, the analysis of operative provisions in international treaties seems to provide a marginally more comforting scenario. Clauses relating to human rights are now a common feature in international treaties and are more likely to appear in international treaties than clauses on sustainable development. For example Articles 72 and 73 of the EU-Cariforum agreement states that the Parties are required to act in accordance with core labour standards, not to operate their investments in a manner that circumvent international labour or environmental obligations and to ensure that foreign direct investment is not encouraged by lowering domestic environmental, labour occupational health and safety legislation and standards or by relaxing core labour standards or laws aimed at protecting and promoting cultural diversity.

The complexity of assessing the impact of the "S" and more generally of human capital arises from a number of factors. It is exceedingly difficult

to measure the impact of upgrading facility safety or regulating hours of work. In this respect, however, a growing body of research suggests how intangibles contribute more and more to corporate value creation. For example, firms that do not treat their human resources well typically suffer higher turnover affecting productivity, trust and innovation. This is expected to negatively affect the value of the corporation. More generally, while there is a consensus that human capital plays an important role in economic development and that when assessing human capital, the focus should not be on school attainment, but on cognitive skills and school quality, a full consensus on an approach for measuring the actual impact of human capital and social capital on economic growth is yet to be reached.

Finally, there is a consensus that in order for disclosure to be effective, its focus should shift. Disclosure should not simply be a factual description of the measures and policies implemented by the corporation in order to address climate change risks. This is an initial, and useful step, but by no means sufficient to enable investors to draw any meaningful conclusion. Therefore, in order for disclosure to be relevant, it should be focused on the actual objectives achieved by the specific measures and policies implemented.

In Europe, the Task Force on Climate-related Financial Disclosure has made progress in shaping a standard for voluntary disclosures by businesses and well over 900 public and private sector organizations have signed up to support it. The quality of the data is improving and is moving towards comparability. In the early 90s no more than 20 companies disclosed ESG data. Today more than 10,000 companies disclose non-financial risks.

With respect to risk identification, most corporates are disclosing macro risk areas: climate-related transition risk and physical risk. Transition risk arises from climate-related events that may damage corporate assets, infrastructure, the supply chain, or the natural environment in which the corporate operates. Transition risk arises from the shift to a carbon-neutral economy. This may impact asset values, corporate valuations, energy prices, the corporation customers' ability to honour their debts. Transition risk may arise from a variety of different factors including technological innovation, consumers tastes and preferences and legal and regulatory changes. The impact of stranded assets on company valuations is a practical illustration of how transition risk may affect the market value of the assets and consequently of the companies that extract, distribute or whose business is highly dependent on fossil fuels. Stranded assets

consist of reserves that should in principle remain unutilized in order to ensure that global temperature reduction targets are met. Typically, assets become stranded as a consequence of regulatory changes, customers demand or innovation. Regulations imposing restrictions on the usage of fossil fuels may be implemented, customers may opt for greener sources of energy and innovation may make alternative and greener sources of energy more readily available. Impairments applied or to be applied to the market value of such reserves would have a direct impact on the value of the corporation. Predicting the magnitude of such impact requires taking a view on factors that are by nature difficult to predict and quantify, such as the timeframe within which a new regulatory framework may be phased in or how long would it take for a reliable alternative to fossil fuels to become commonly available. Identifying climate change related risks and facilitating such identification by way of enhanced disclosure does not appear to be sufficient to mitigate the impact of such risks. Knowledge should be enhanced and governance mechanisms capable of maximizing the usage and the impact of the knowledge contained in the various nodes of the ecosystem should be identified. Traditional risk management solutions should be adjusted accordingly.

Transition risk and physical risks consist of many interrelated moving parts and any risk management solution is often the result of a strategic compromise. For example, continued emissions will lead to rising temperatures that increase physical risk, but limiting these impacts require substantial emissions reductions that increase transition risk. Corporations should recognize that disclosing non-financial risks is an opportunity to demonstrate their understanding of such risks and facilitate the assessment of their business vulnerability to such risks by third parties. Transparency should also lead to a greater level of constructive engagement with all stakeholders. It has been observed that there is a positive association between ESG disclosure level and firm value, suggesting that improved transparency and accountability and enhanced stakeholders trust play a role in boosting firm value. The value of a corporation is somewhat subjective and, as discussed in more detail in the following chapters, different investors may assign a different value to different assets (especially intangible assets). Furthermore, performance and value can be measured in many different ways. In this respect it should not be taken for granted that the existing and commonly accepted measures of performance are suitable to capture what is relevant for all stakeholders or that the non-financial statements and the level of disclosure of physical risk

and transition risk, which as of today remains largely discretionary, satisfy all the stakeholders.

Traditional risk management tools and skills may not be sufficient to assess transition and physical risks. Credit experts alone are unable to identify transition risk pathways and sustainability experts may not be able to conduct a comprehensive assessment of the impact of specific transition risk pathways on the creditworthiness of a corporation or of its customers. Corporations will have to enhance internal governance mechanisms to ensure that the usage of internal resources is optimized. Credit rating agencies are gradually starting to incorporate ESG valuations in their credit assessment underpinning both fundamental ratings and structured finance ratings. As of today, credit ratings do not yet incorporate a full qualitative and quantitative assessment of climate-related risks. It is however expected that rating agencies' involvement in this space will contribute to improving reporting standards and enhancing the general understanding of the impact on credit quality of climate-related risks.

Agency Model and Corporate Mission

The growing sophistication of the ecosystem in which corporates operate and the consequent evolution of the concept of corporate mission, constitute an additional layer of complexity. It has been observed that corporates are becoming accountable to a larger and more diverse stakeholders' base (Johnston 2008). Different stakeholders have different objectives. More importantly, the stakeholders' base is dynamic. Over time, as technology improves, scientific knowledge progresses and the way in which natural resources can be exploited evolves, and energy produced and stored, the stakeholders base and its expectations change. There are multiple ramifications to this complexity. It appears legitimate to suggest that certain aspects of the traditional agency model, which is often used to understand and manage conflicts between management and risk-takers should be reconsidered and expanded so as to capture within the definition of risk-takers, not only shareholders but all the stakeholders including those that are accidental risk-takers and whose interests are directly or indirectly affected by the business decisions of the corporation. Corporations should therefore acknowledge an implicit fiduciary duty towards a broader and fluid stakeholders base. Discharging a fiduciary duty towards a fluid stakeholders base is no trivial task as the stakeholders may change or the priorities of such stakeholders may change. In this context, in order

to generate value, the corporation should be able to define its role within the ecosystem in which it operates independently and autonomously and based on overarching objectives. In order to do so efficiently, the corporation should also be able to understand the impact of its choices and actions on the ecosystem itself, which is another reason why it is pointed out that self-consciousness is a fundamental pre-requisite for a corporation that wishes to be an active and value-adding member of the Climate Change Ecosystem. The fiduciary duty should therefore be towards the ecosystem itself, its principles, its objectives and its participants, to the extent that their interests and priorities are aligned with those of the ecosystem.

Senior management and key employee's remuneration mechanisms play an important role in this respect. Compensation and its main components, including base compensation and variable compensation both corporate-performance linked and individual-performance linked should remain unaltered as they facilitate the alignment of interest between management and stakeholders but could also be used as a tool—mainly by deferring part of the compensation—to discourage short-termism on the part of the management. Due to the different layers of interests affecting the shareholders' base directly and indirectly some scholars (Frentrop, 2012) have proposed a more nuanced approach to the agency theory based on the assumption two agency relationships exist. The first one is the traditional one, where the shareholder is the principal and the company director is the agent. In the second agency relationship, the principal is the ultimate beneficiary of an institutional investor and the agent is the portfolio manager.

Directors and senior management involvement with the business is limited to the term of their tenure and should not be surprising that directors and management often tend to favour strategies leading to crystallization of profits during the term of their tenure at the expenses of long termism. This could lead to excessive risk-taking or moral hazard which could potentially erode value in the long term. With respect to the relation between bank failures and corporate governance, Berger et al. (2016) argue that defaults are strongly influenced by a bank ownership structure: high shareholding of lower level management such as vice presidents, increase default risk significantly. In contrast, shareholdings of outside directors and chief officers (managers with a "chief officer" position, such as the CEO, CFO, etc.) do not have a direct impact on the probability of failure. These findings suggest that high stakes in the bank

induce lower level management to take high risks due to moral hazard incentives, which may eventually result in bank default.

The latest global financial crisis has undermined the traditionally accepted concepts of corporate mission and made scholars and practitioners more interested in identifying alternatives.

However, predominant economic theories suggest that managers should priorities the interests of the firm equity holders (Friedman, 1962). This objective is typically achieved by maximizing the present value of a firm's future cash flow. Some scholars have observed (Mayer, 2018) that if the attainment of profits does not come from their pursuit but is the product of some other purpose then the achievement of that purpose requires the management of other sources of capital such as natural, human and social as financial capital. From a legal point of view, it has been argued that directors are entitled to put other interests above profit maximization, provided that when deciding to do, so they are not conflicted and they act in what they believe to be the best interest of the firm. From a financial point of view, the position is more nuanced. It remains to be demonstrated if an alleged sustainable investment strategy can reduce the present value of future cash flows and generate monetary value at the same time. It has been argued that the answer to the question is affirmative when the demand exceeds supply. If supply and demands conditions are not favourable, engaging in socially responsible activities can actually reduce the market value of a firm. This finding does not solve the problem, especially because the impact of supply and demands dynamics are particularly relevant in the context of sustainable and adaptation investing as the amount of capital that is available to be deployed to support sustainable investments is relatively large compared to the size of the permitted eligible investments.

What is the legal framework that is most suitable to allow corporations to adapt and evolve their corporate mission in response to an ecosystem increasingly complex, a broader and non-homogeneous stakeholders base with different objectives, investment horizons and that assesses performance and value based on different methods?

Does the Conscious Corporation Need a Dedicated Legal Framework to Thrive? Initial Observations

While speaking about these interesting issues we need to fix and summarize the following main concepts: (a) any corporation that wishes to

be part of the Climate Change Ecosystem should be a self-conscious corporation. It should be aware of its role within the ecosystem and of the consequences that its actions will inevitably have on the ecosystem itself. The conscious corporation is an integral part of its ecosystem and due to the intimate relationship between the various component of the ecosystem, decoupling is not possible.

As eloquently indicated (Pope Francis, 2015) "*it cannot be emphasized enough how everything is interconnected. Time and space are not independent of one another, and not even atoms or subatomic particles can be considered in isolation. Just as the different aspects of the planet – physical, chemical and biological – are interrelated, so too living species are part of a network which we will never fully explore and understand*".

As a consequence, a corporation will never be able to thrive in the long term if it failed to create value for the ecosystem as a whole; (b) the conscious corporation should have a long-term view. Short termism is not only negative but more fundamentally inconsistent with the rationale underpinning sustainable investing. A corporation that generates short term profits without assessing the long-term sustainability of its business is most likely compromising its ability to generate value in the long term; (c) transparency and homogenous data disclosure are essential pre-requisite for the conscious corporation to be able to attract new capital, and (d) the governance model should protect and advance the objectives of all the stakeholders in the ecosystem and enable the ecosystem as whole to thrive.

Would a dedicated legal framework be necessary or beneficial for the conscious corporation? Does the absence of a dedicated legal framework negatively affect the ability of the conscious corporation to achieve its objectives and pursue its corporate mission? The answer to the question is largely dependent on the characteristics of the legal framework in question. However, we will only limit our preliminary and not exhaustive analysis to the theoretical benefits of a dedicated legal framework irrespective of its specific characteristics.

In the US and Europe lawmakers have made several attempts to regulate social enterprises and benefit corporations. Today at least nineteen states in North America have passed a legislation on social enterprises.

On the other side of the Atlantic, the UK and Italy have recognized the concept of Community Interest Companies and "*società benefit*", respectively. In 2009 the concept of mission corporation (Société a' mission) was introduced in France by the Loi Pacte.

A Community Interest Company is a limited liability company designed for social enterprises which has the specific aim of providing benefit to a community and uses its income, assets and profits for the community it is formed to serve. It can be limited by shares or by guarantee but must satisfy a community interest test. This could potentially be a useful model for a future hypothetical dedicated legal framework assuming, of course, that the interest satisfied by the corporation is wide enough to be relevant for the community as a whole and not just for a limited group of stakeholders and the corporation satisfies the "do no harm test". Such a test requires that the activity of the corporation should not harm any of the other objectives of the community.

The Italian "*società benefit*" (SB) was introduced in Italy by Law 208/2015. The Italian SB is a for-profit corporation with a dual corporate object. It conducts a traditional economic activity but simultaneously attempts to pursue a common benefit. The Italian model is a first in a civil law environment.

According to the currently prevailing views on benefit corporations (Battilana et al., 2017) Italian SBs, due to their dual corporate object, may be classified as hybrid organizations. Pursuing simultaneously a social purpose or an environmental objective and profitability is a challenging exercise. The different objectives to be pursued by a benefit corporation, or a società benefit maybe conflicting due to their very nature or simply because, at least in the short term, they are inconsistent with the for-profit status of the corporation. Simply put, the for-profit status may conflict with the pursue of a social purpose. In order to manage such conflicts, a governance enabling a transparent and predictable allocation of priorities is essential. New skills may have to be developed in order to fully exploit the potential of the SB status. The law for example provides for a benefit officer to be appointed in order to ensure, among other things, the harmonized implementation of the objectives of the corporation.

A recent study on Italian benefit companies (Bellavite Pellegrini & Caruso, 2020) produced data indicating that the number of newly formed società benefit and of existing corporates electing to convert to the SB status has been increasing since the implementation of the SB framework in Italy. More importantly, the study produced empirical evidence demonstrating that the SB status "has a positive effect on ROA" and "may contribute to a reduction of risk and of cost of capital".

It may be argued that the dual corporate object of Italian SBs makes them a good fit for the Climate Change Ecosystem. It is also inherently

consistent with the theory according to which it is possible for firms to do well while doing good. Empirical evidence has been collected by scholars Fan and Michalski (2020) showing that sustainable investing allows incorporating ethical preferences while offering strong potential for wealth generation. As a result, the SB model appears to be in principle the right tool to attract capital from investors—whether or not such investors have a mandate to invest in sustainable or ESG projects and assets—and direct such capital to sustainable investments and projects. Directing financial resources to sustainable projects and investments is a priority for European environmental policies (see Chapter 2). Due to the above, it may be legitimate to assume that a model that is financially sound and an enabler of policy objectives is likely to be replicated and fine-tuned.

The benefit of a legal framework, like any other working tool, should not be assessed in principle but by reference to its ability to contribute to the achievement of a pre-determined result.

A conscious corporation creates value by constantly increasing its awareness of the objectives and priorities of the Climate Change Ecosystem, by fostering knowledge, research and innovation, by deploying financial capital towards projects that would enable the ecosystem to achieve its objectives. The Climate Change Ecosystem is dynamic and is constantly evolving.

Requiring a corporation, like the conscious corporation, whose major strengths include consciousness and awareness and the ability to use discretion for the benefit of all stakeholders to act based on a legal framework is not without challenges. The ability to adapt and exercise discretion are fundamental conditions for the conscious company to create value. Any restriction imposed on the ability of the conscious corporation to adapt and exercise discretion would very likely jeopardize the ability of the corporation to create long term value. Whether or not a dedicated legal framework could facilitate or encourage the adaptation or evolution of the conscious corporation is yet to be determined and further research would be necessary in order to express a final view on this matter. In this respect, it has been observed (Bellavite Pellegrini & Caruso, 2020) that the Italian SB framework contributes to clarify the relation between the different components of the corporate object of SBs and therefore should be considered as a valuable tool for transitioning to a more sustainable economy.

It is however evident that the knowledge of ESG matters enables a thorough understanding of the risks and opportunities a company faces,

allowing enhanced security selection and risk management. Additionally, ESG analysis leads to an improved understanding of how future trends could affect a certain industry or the entire economic landscape for that matter. The second part of the book will explore and provide empirical evidence supporting the theory whereby corporations that have invested in adaptation and with a higher ESG score typically create more value than their peers that have failed to adapt or are less advanced in their adaptation process.

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