

The challenging transition to bio-economies: Towards a new framework integrating corporate sustainability and value co-creation

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Abstract

The transition to equitable and sustainable societies has become even more important for both scholars and managers. Bio-economies are based on renewable resources to build an economic system to be sustainably implemented to ensure cleaner, safer production and consumption, building on innovation; the main driver of firm success especially today.

Considering sustainability which can lead to bio-economy, it is clear that social and economic aspects cannot be separated from each other. Therefore, also new firm practices and/or approaches are needed, able to encompass corporate sustainability issues and dimensions - social, economic, environmental, and time - as key issues, without forgetting the primary role of innovation. Past studies have proposed a new approach in the field of firm practices oriented to corporate sustainability. The present paper aims at making a step forward in this direction considering the value co-creation approach following a strategic perspective for the first time and putting forward a new framework explicitly integrating the key features of the recently proposed “Sustainability Oriented Theory of the Firm” into the value co-creation approach. Indeed, the proposed framework is able to show how the four dimensions of corporate sustainability can be fully encompassed in a model of value co-creation built around both innovation and the key features - inclusivity, generativity, linkability and evolvability - to start the co-creation movement on behalf the entire society and not only on behalf the firm goals. The proposed framework is therefore able to suggest to firms how to simultaneously manage value co-creation processes, corporate sustainability, and by this way contribute to bio-economies.

Keywords: Bio-economy; Sustainability; Sustainability Oriented Theory of the Firm; Value co-creation; Theoretical framework

1 Introduction

The transition to sustainable and equitable societies has become a major concern for governments, institutions, firms and scholars. This transition is fuelled by population growth, the decrease in available arable land, concerns about climate change, “the finite nature of fossil resources” which underlines the importance of bio-energy, as well as biomass, as alternative industrial raw materials ([Talavyria et al., 2016](#), p. 40).

Bio-economy can be considered part of the green economy whose main concept has already been included at the very core of the European Commission long-term strategy towards 2050. However, in respect to green economy, bio-economy is more centered “on the use of renewable raw materials and application of research, development and innovation and industrial biotechnology” ([Scarlat et al., 2015](#), p. 4). Moreover, it encompasses and highlights the importance of innovation to find new growth opportunities in various industry sectors being aware of the global scenario and the challenges arising within it, not only at a firm and/or National and/or European level, but also within the

global scenario (Mazza and ten Brink, 2012; EC, 2014; Scarlat et al., 2015).

Indeed, bio-economy is still a controversial concept. In fact, even if McCormick and Kautto (2013) state that bio-economy, bio-based economy and knowledge based bio-economy can be considered as synonymous following the multi-sector approach embraced by the OECD (Scarlat et al., 2015); in the United States bio-economy is exclusively referred to as synthetic biology (i.e., biological innovations; US, 2012; Scarlat et al., 2015).

Embracing the European Commission definition, bio-economy can be understood as economy “encompass[ing] the production of renewable biological resources and their conversion into food, feed, bio-based products and bio-energy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries” (European Commission, 2012, p. 5). Besides the US and European Commission approaches mentioned above other definitions of this same term focus on specific sectors such as bio fuels (Scarlat et al., 2015) or biotechnologies (OECD, 2009) or consider that bio-economies are characterized by reduced GHG emissions as well as by the reduction of the use of fossil fuels (Philp, 2015).

The growing interest of Governments and supranational Institutions on this particular issue is parallel to published academic papers which reached a total number of 6500 to March 2016 using a Scopus search taking into account studies related to bio-economy (Dries et al., 2016). In the general bio-economy literature, different perspectives have been embraced to study its various aspects ranging from social sciences (i.e., Dries et al., 2016) to chemistry (i.e., Yishai et al., 2016), from European/National economy (i.e., de Besi and McCormick, 2015; Heijman, 2016) to commodity science (i.e., Huisingh et al., 2015; Ingrao et al., 2015), just to give a few examples.

In this paper a definition of bio-economy encompassing all economic sectors and not only biofuels or biotechnology, for example, will be considered.

In this domain, the paper will focus on both innovation, as an essential issue in bio-economy, and the need for new business models and managerial approaches to be developed within firms to achieve it, assuming a micro perspective. In this sense, the paper will also directly consider some contextual factors, in particular consumer attitudes and desires, accepting the invitation to perform multi-disciplinary research which is still lacking (Dries et al., 2016).

The natural touch points between bio-economies, studied at a macro and a meso level, on the one hand, and business models and managerial approaches, on the other, are sustainability and innovation. Indeed, bio-economies must be sustainably implemented to ensure cleaner and safer production and consumption building on innovation (Pülzl et al., 2014; Huisingh et al., 2015). “Sustainability may [...] be defined as maintaining well-being over a long, perhaps even an indefinite period” (Kuhlman and Farrington, 2010, p. 3441) and in itself is even more important for firm growth and development (Bateh et al., 2013). Corporate sustainability, which considers sustainability to be developed at a firm level, as a multidimensional construct should encompass, following a quite recent approach: applications at a business level such as communication of sustainability processes and/or actions; objectives to be included in the organizational main aims; special focus on environment, social, economic and equity issues; rules respect at all levels in the organization and outside it; innovation oriented to sustainability (Amini and Bienstock, 2014).

Innovation, from its side, must be considered as the main driver of firm success in that it not only generates new products and/or services, but is able to create and/or shape ever new markets, outside the traditional domain in which the firm had previously operated (Pitelis and Teece, 2009), sometimes guided by “users” (von Hippel, 2005).

Moreover, social and economic aspects cannot be separated in implementing sustainability because “in reality [they] are one and the same” (Kuhlman and Farrington, 2010, p. 3436). Therefore, it is clear that to ensure the transition to equitable and sustainable societies, new firm theories and/or approaches are needed, which are able to encompass sustainability issues and dimensions as key issues, putting innovation at their very core.

Literature has started to examine this issue looking at contributions of previous theories to Corporate Sustainability (CS) with its four basic dimensions (social, economic, environmental and time) and distilling from them ten core principles on which the “Sustainability Oriented Theory of the Firm” (Lozano et al., 2015) is based.

However, the present paper aims at making a step forward in this direction, bridging this new theory with the value co-creation approach, following a strategic perspective (i.e., Ramaswamy and Ozcan, 2014) in that it shares with sustainability a different view of the role of the firm in its own context and within society as a whole, bringing a lasting expansion of wealth-welfare-wellbeing.

Therefore, the paper proposes a new framework explicitly integrating the key features of the “Sustainability Oriented Theory of the Firm” into a value co-creation model, seeking to integrate the core dimensions and principles of CS into an updated firm approach focused on innovation to clarify how firms could contribute to build bio-economies.

From a theoretical point of view, the paper contributes to corporate sustainability, value co-creation approach and bio-economy literature, adopting a different perspective from previous studies and focusing on the role of the firm. It builds on the assumption that firms are essential in the transition to bio-economies, in that they are “the *locus* of innovation in the economy” (Pitelis and Teece, 2009, p. 6). This statement emerges from the definition of innovation itself which can be understood as “a process that follows invention, being separated from invention in time. Invention is the creative act, while innovation is the first or early employment of an idea by one organization or a set of organizations with similar goals” (Becker and Whisler, 1967, p. 463). Obviously, local and regional *milieux* (Cooke and Morgan, 1998) as well as government policies (Simard and West, 2006) can be of great help above all when innovation is costly, complex or has to be developed in firm networks, but innovation cannot occur without firms engagement.

From a managerial standpoint, this framework could help managers integrate different management approaches, sharing key and common features in order to create a sole model built around equitable sharing of the value created together through collaboration and innovation, able to foster sustainability towards the transition to bio-economies.

The paper develops as follows. Section 2 provides a literature review of both the “Sustainability Oriented Theory of the Firm” and the value co-creation approach. Section 3 presents the integrative framework proposed and discusses it. Section 4 concludes the paper illustrating theoretical and managerial implications as well as limitations and future avenues of research.

2 Basic theoretical underpinnings

2.1 The “Sustainability Oriented Theory of the Firm”: essential insights

According to the “Sustainability Oriented Theory of the Firm” proposed by Lozano et al. (2015) “the firm is a profit generating entity in a state of constant evolution. This entity is a system comprised of resources and networks of relationships with stakeholders. The firm's employees are responsible to represent the firm, manage its resources, and empower its stakeholders so that the firm complies with laws, maintains its ‘licence-to-operate’, increases its competitive advantage, and better contributes to foster the evolution of more sustainable societies by holistically addressing the economic, environmental, social, and time dimensions.” (p.440).

This definition is the result of a review of some “theories of the firms” that authors have formulated in order to provide an “ethical know-how” (p. 439) on how these contribute to CS and to clarify to company leaders how to dynamically integrate its dimensions. In fact, in recent years, several studies have been developed on CS issues as well as on firm theories but, according to Lozano et al. (2015), no research has sought to analyze or understand how CS and firm theories are linked together. In order to fill this gap the authors propose a holistic perspective following a systemic approach as also suggested by Linnenluecke et al. (2009).

In particular, the authors follow the categorization proposed by Seth and Thomas (1994), dividing the theories of the firm into three groups: 1) the entity namely Corporate Entity, or personality, theories; 2) the nature of the firms, namely Corporate Nature Theories and 3) the firm's obligations towards different groups, namely Corporate Obligation theories.

Because the theories of the firm belong to the realm of social sciences, authors have used the interpretative approach using hermeneutics as a method, as suggested by Bernstein (1982), to explore how these theories contribute to CS, also in the light of the CS identified dimensions - economic, environmental, social and time.

Indeed, Lozano (2012, Lozano et al., 2015, p. 431) defines CS as “corporate activities that proactively seek to contribute to sustainability equilibria, including, the economic, environmental, and social dimensions of today, as well as their inter-relations within and throughout the time dimension while addressing the company's system (including operations and production, management and strategy, organizational systems, procurement and marketing, and assessment and communication); and its stakeholders”.

Therefore, developing their study thanks to a “meta-interpretations of the CS phenomenon”, Lozano et al. (2015, p.438) identified ten principles on which the “Sustainability Oriented Theory of the Firm” is based.

Building on Lozano et al. (2015), but focusing on the ten principles of “Sustainability Oriented Theory of the Firm” instead of on the CS dimensions, the following table has been created (see Table 1). It shows how the ten principles have been distilled by all three groups of firm theories as well as single theoretical approaches analyzed and interpreted by the authors.

Table 1 Links between principles and Theories of firms.

alt-text: Table 1

Source: our elaboration from Lozano et al. (2015).

Principles	Groups of Theories [Seth and Thomas' (1994) categorization]	Theories of firms
(1) the firm must generate profits;	Corporate Entity theories, or personality, Theories	Aggregate Entity theory
	Corporate Nature theories	The Contractual Theory and the Agency Theory
		The Evolutionary Theory
	Corporate Obligation theories	The Stockholder theory

(2) the firm and its system (including operations and production, management and strategy, organizational systems, procurement and marketing, and assessment and communication) are constantly evolving;	Corporate Nature theories	The Evolutionary Theory
(3) the firm is comprised of its products, services, internal activities, structure, operations, management, and relations to stakeholders;	Corporate Entity theories, or personality, Theories	Aggregate Entity theory
	Corporate Obligation theories	The Stockholder theory
		The Stakeholder Theory
(4) the firm has inter-related tangible, intangible and human resources;	Corporate Nature theories	The Resource-Based View (RBV) theory
(5) the firm influences, and is influenced, through a network of relations, and by a number of social and non-social stakeholders which can provide or rescind the firm's 'licence-to-operate';	Corporate Entity theories, or personality, Theories	The Artificial Entity theory
	Corporate Nature theories	The Contractual Theory and the Agency Theory
	Corporate Obligation theories	The Stockholder theory
		The Stakeholder Theory
(6) the firm is controlled by its managers, who are responsible for overseeing and ensuring that its activities are within the law;	Corporate Obligation theories	The Social Contract theory
	Corporate Entity theories, or personality, Theories	The Real Entity theory
	Corporate Nature theories	The Evolutionary Theory
(7) the employees are 'ambassadors' of the firm and are responsible for balancing the profit generation objective of the company with its responsibilities to all stakeholders;	Corporate Obligation theories	The Social Contract theory
	Corporate Obligation theories	The Stakeholder Theory
(8) the employees are responsible for developing the firm's resources and for integrating them holistically throughout the firm's system over time to provide it with a competitive advantage;	Corporate Nature theories	The Resource-Based View (RBV) theory
(9) the firm and its employees can be accused of crimes against sustainability;	Corporate Entity theories, or personality, Theories	The Real Entity theory
	Corporate Obligation theories	The Social Contract theory
(10) the firm and its agents are obliged to recognize that their firm, competitors, legislators, consumers, the environment, and the world, are constantly evolving.	Corporate Nature theories	The Evolutionary Theory
		The Resource-Based View (RBV) theory

[Lozano et al. \(2015\)](#) conclude their study stating that “the iterative process [they carried out] revealed that each theory can be ‘a part of the puzzle’ and can connect with the other parts” (p. 439). In particular, the authors have demonstrated that building an integrative and holistic theory of the firm is a strategic imperative in order to both create a sole frame to develop future studies in this domain and support managers in more effectively implementing and succeeding in CS activities.

2.2 Value co-creation approach following a strategic perspective: a brief review

The value co-creation approach considers that value can no longer be created and above all appropriated only by firms but has to be co-created with individuals inside and outside its boundaries and equitably appropriated by all participants of co-creation processes (i.e., [Ramaswamy and Ozcan, 2014](#)). This means that value can no longer be identified exclusively with profit to be captured by firms, it has to be understood as a set of different *values* able to be appropriated by all individuals participating to co-creation ([Denning, 2014](#)). Those *values* which can be interpreted as a value able to change its form during co-creation processes is made on by intrinsic and extrinsic benefits ([Antikainen](#)

et al., 2010) individuals inside and outside the firm capture for themselves in light of their participation to co-creation. Partners should therefore participate in firm innovation processes, not only concerning product and/or services, but also collaborating on organizational changes or even setting new firm goals and/or strategies if desired and/or required (Ramaswamy and Ozcan, 2014). In this way, value is created and simultaneously appropriated by a plurality of individuals contributing to build sustainable growth for both the firm and the context in which it operates.

Value co-creation can be defined as a “view start[ing] with interactions as the locus of value and platforms of engagements with individuals are the locus of value creation, and co-creative enterprises follow a single principle: they focus their entire organization on the engagements with individuals” (Leavy, 2014, p. 11). Starting with this definition, it is clear that this new approach to the firm is completely different from those offered in the past in that it proposes a shift in the mindset (i.e., Ramaswamy, 2009a) from a firm-centric to an individual experience-centric perspective (i.e., Reay and Seddighi, 2012; Ramaswamy and Ozcan, 2013). Individuals collaborating inside and outside the firm become central in that co-creation “is based on collaborative, dynamic, contextual, and generative human interactions at the core” able to generate human experiences (Ramaswamy, 2011, p. 196). In this context interactions are the *locus* of value (Leavy, 2014, p. 11) while human experiences are the basis of value (i.e., Ramaswamy and Ozcan, 2014) and the focus of the firm is on generating so-called evolvable experiences (Prahalad and Ramaswamy, 2003). Indeed, even if a clear definition of the main strategic direction serves as a basis to co-create (Ramaswamy and Gouillart, 2010a) and innovate, this doesn't mean that firms can decide on their own how to develop a project or a design to be realized also thanks to individuals outside the firm. Products and services are just a means to generate ever new human experiences in a never ending cycle in that “co-creation is both the means and the end, in a continuous cycle” (Ramaswamy and Gouillart, 2010a, p. 29). Alternatively, it can be said that each individual co-creates value related to all other individuals collaborating in co-creation processes and not just together and/or on behalf of the sole firm (Ind et al., 2013).

Therefore, the firm is a “facilitator” of interactions, it can initiate and/or propose a project which is then developed through interactions between peers (Ramaswamy and Gouillart, 2010b). It can also join an already initiated project, in an engagement platform which it has not created; even if the most studied case is the opposite, where the firm creates an engagement platform able to attract and have the most suited individuals effectively interacting. However, it is worth pointing out that value co-creation occurs following this approach, notwithstanding who has started it, only if two conditions are simultaneously fulfilled: 1) individuals play active roles in value co-creation; 2) individuals gain some benefits from their collaboration and engagement in co-creation processes (Saarijärvi et al., 2013). Moreover, the firm's attempt to control the full process seeking more benefits than other individuals participating in value co-creation processes (Bhalla, 2011). This would lead to negative outcomes like a drop in the community sense no longer supported by the motivation to collaborate, trust towards the firm, creativity and the willingness to participate; individuals would fear to be judged by the firm for their contributions (Ind et al., 2013).

As a consequence of the clear focus of this approach on individuals and human experiences, firm employees assume a key role in value co-creation processes also witnessed by the new *tagline* proposed by Ramaswamy and Ozcan (2014, p. 207) “Employees First, Customers Second (EFCS)”.

Employees are the only means the firm has to participate in value co-creation following this approach. Therefore, it can be said that employees are responsible for the interactions they carry out within the engagement platforms and also for maintaining motivation and willingness of individuals outside the firm to participate and continue to be engaged, in that they represent the partners' view. On the other hand, individuals outside the firm and especially customers, during the value co-creation process interactions consolidate their relationships with firm employees over time. They can also enhance employees pleasure and/or willingness to interact with them and can contribute to reduce stress in the workplace as well as increase employee commitment and job satisfaction (Chen et al., 2015).

The experience domain, the first pillar of the value co-creation approach according to Ramaswamy (Leavy, 2013), can therefore be defined as “a stratum of individual involvement, events, contexts, and meaning, whose configuration of experiences embodies actualized outcomes in value creation. Experience domains span environments of interactions afforded by engagement platforms” (Ramaswamy and Ozcan, 2014, p. 53).

Engagement platforms, the second pillar of this approach, are the *locus* of value co-creation (Leavy, 2014). They can be defined as “an assemblage of persons, processes, interfaces, and artifacts, whose engagement design affords environments of interactions that intensify agential actions in value creation” (Ramaswamy and Ozcan, 2014, p. 34). They are the *locus* in which value co-creation processes develop and where the best ideas are nurtured by ever new insights coming from all individuals participating in co-creation (Ramaswamy and Gouillart, 2012). They are also the *locus* in which “mutual value is expanded together, where value to participating individuals is a function of their experiences, both their engaged experiences on the platform, and productive and meaningful human experiences that result” (Ramaswamy, 2011, p. 195).

This statement leads to at least two different considerations. The first concerns the importance of individuals who remain engaged over time, highlighting the time dimension of this approach; a view shared by Porter and Kramer (2011) who suggest firms focus on creating shared value over time. The second regards the value of human experiences made on an engagement platform for individuals who use them in whichever context they choose, not only to continue to co-create with the firm but also to start co-creating in another engagement platform, whether leaving or not the one they collaborate in and in which experiences have been made, also nurturing the ecosystem of capabilities (see below). This concept, from another perspective and looking at new individual experiences, underlines why the success of a firm in a given context is strictly linked to the prosperity of the context in which it operates. This same concept was expressed in another way by Ramaswamy who states: “the importance of ‘engagement platforms’ is central to realizing of the full economic growth and human welfare potential of co-creation” (Leavy, 2013, p. 13).

The contribution of human experiences at a more general level would appear even clearer considering the ecosystem of capabilities, which is the third pillar of the value co-creation approach according to Ramaswamy (Leavy, 2013). Capability ecosystems in the author's words “entail “virtualized” value, that is, “value that is real but not actual yet.” In the co-creation view, value is actualized in the novelty, variety, quality and personalization of experiences of individuals” (Leavy, 2013, p. 14). Human experiences made during interactions in engagement platforms are, as a consequence, the way in which value becomes real for each individual engaged in the co-creation process and, it can be said, are appropriated by each participant at each time in different ways, generating different values as already mentioned above. Indeed, ecosystems of capabilities “tap into both open and social resources as well as enterprise and network resources” (Leavy, 2013, p. 14) to create ever new capabilities at an ecosystem level starting from individual ones (Leavy, 2013; Ramaswamy and Ozcan, 2014). This shows the ever stronger relationship between the firm and the context in which it operates today. Moreover, the ecosystem of capabilities can be understood as both the engine and the domain in which the firm is embedded; in the same the firm, to be understood as an “ecosystem innovator” (Ramaswamy and Ozcan, 2014, p. 87), requires starting the entire co-creation movement not only on behalf of it, but on behalf of society as a whole. To assure the above mentioned ability of the ecosystem of capabilities, firms should pay attention to four core principles in creating them: inclusivity, generativity, linkability and evolvability (Ramaswamy and Ozcan, 2014, p. 87). Inclusivity highlights the need for the firm to be able to attract and engage the most suited individuals with whom to co-create, also paying attention to the democratic and respectful development of the entire co-creation process (Ramaswamy and Ozcan, 2014). Generativity is about the capability of the ecosystem to support the generation of ever new capabilities within it over time and “is a function of technical, social, and organizational capacities of interactions in the environments that the architecture of engagement platforms afford to facilitate the generation of potential outcomes of value to individuals” (Ramaswamy and Ozcan, 2014, p. 88). Linkability pertains to the “networked capacities” encompassed in both firm engagement platforms and those of other firms operating in the same “ecosystem of social, business, civic, and natural communities in which enterprises operate” (Ramaswamy and Ozcan, 2014, p. 88). “Evolvability is about change” and the ability of the system to be “greater than the sum of its single parts” (Reid, 2007; Ramaswamy and Ozcan, 2014, p. 89). The ecosystem must be able to change over time preserving the heterogeneity of individual experiences on which the ecosystem is based and ensuring the generation of ever new capabilities from diverse and new combinations (Ramaswamy and Ozcan, 2014).

The core principles to be respected in creating and running ecosystems of capabilities clarify that nowadays business, society, and the whole environment are strictly interrelated, but also that the firm can play an important role towards the “expansion of wealth-welfare-wellbeing all around” by adopting a “win more -win more” approach (Ramaswamy and Ozcan, 2014, p. 31). Indeed, “co-creatively leveraging all stakeholder capabilities in meshworks of social, business, civic, and natural communities can lead to better states of governance, infrastructure, development, and sustainability” (Ramaswamy and Ozcan, 2014, p. 31).

3 An integrative framework

The “Sustainability Oriented Theory of the Firm” as well as the value co-creation approach briefly described above show, even at first glance, some important shared concepts and assumptions, which have been combined to create the integrative framework illustrated in Fig. 1.

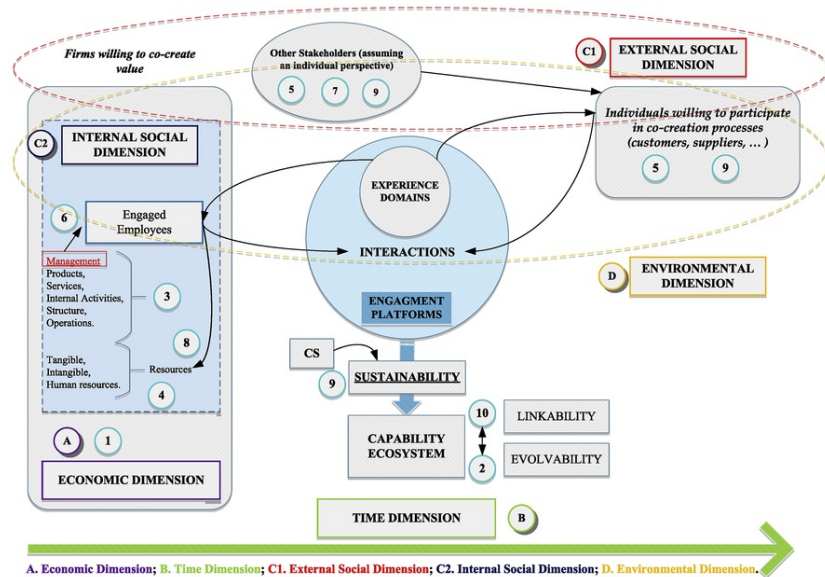


Fig. 1 An integrative framework.

alt-text: Fig. 1

The framework has been created starting from the three pillars of the value co-creation approach: experience domains, engagement platforms and capability ecosystems. To underline that experience domains are generated by interactions taking place in engagement platforms and carried out by individuals inside and outside the firm, two blocks –one for the firm and the other for individuals outside it– have been created. These relations have also been shown through the black arrows connecting engaged employee and engaged individuals outside the firm to interactions and experience domains. More than one engagement platform can be created by the firm and all of them contribute to the ecosystem of capabilities which can be expanded through them. Engagement platforms can also be created by other individuals outside the firm or even other firms (see above section 2.2.). To simplify the model just one engagement platform has been considered.

To clarify the shared assumptions and the common traits of the two approaches considered in this paper, the framework has then been integrated, first adding the ten principles on which the “Sustainability Oriented Theory of the Firm” is based and then highlighting the four dimensions of the CS pointed out by [Lozano et al. \(2015\)](#).

To clearly illustrate this framework, the CS dimensions should be considered in the order proposed in [Fig. 1](#).

The economic dimension of CS (A in [Fig. 1](#)) considered as economic viability must not be confused with “sustained growth and self-sufficiency” ([Lozano, 2008a](#), p. 1839). Indeed, the economic dimension of CS must be read together with the social and environmental aspects of CS in the short and long term ([Lozano, 2008b](#)). This though comes from the benefits firms could have adopting non-competitive approaches to create competitive advantage, which leads to sustainable growth and higher profits for all firms of the same industry in the long run ([Porter, 1998](#)). Today, these results could also be achieved by firms pertaining or otherwise to the same industry, but collaborating towards common goals as also considered for example by Open Innovation (i.e., [Chesbrough, 2003](#)) as well as value co-creation approaches. In this same vein, co-opetition settings are even more easily realized at different levels and among them at an inter-organizational stage (i.e., [Bengtsson and Kock, 2014](#)). The economic dimension of sustainability today is therefore linked to a more general horizon encompassing not only the firm, but also the industry and all domains in which the firm, in whichever way, collaborates, thus contributing to social and environmental sustainability in the long run. In this sense, it can be said that the word “profit” in this study could be better understood as one of the *values* which can be generated by co-creation; a value which must be shared with all individuals participating to co-creation processes. The latter highlights that collaboration is needed both inside and outside the firm (i.e., [Ramaswamy and Ozcan, 2014](#)) and collaborating individuals must be rewarded for the active roles they play in contributing to co-creation ([Saarijärvi et al., 2013](#)). Building on this, the economic dimension (A in the framework) has been put in the firm block, together with the first principle of the “Sustainability Oriented Theory of the Firm” (principle 1 in the framework) pointing out that profit - or better, value - is necessary for firm survival, to which, however, also collaboration inside and outside firm boundaries is essential.

The above considerations lead directly to the second dimension of the CS examined: time (B in the framework). The time frame of CS must be considered as lengthy, as also suggested by the sustainability concept. The holistic perspective of sustainability suggests that there are “two dynamic and simultaneous equilibria: the first one amongst economic, environmental and social aspects, and the second amongst the temporal aspects, i.e. short-, long- and longer-term perspectives” ([Lozano, 2008a](#), p. 1840). The value co-creation approach considering co-creation as a never ending cycle and a continuous movement between engaged individuals who must remain engaged to co-create, allows, in some way, the two above mentioned equilibria to merge as just one. Indeed, in this approach, collaboration and innovation are not only addressed to new products/services, but can encompass organizational aspects as well as strategic firm goals ([Ramaswamy and Ozcan, 2014](#)) whose effects develop in the long-term. Moreover, co-creation processes, even if realized in a shorter period of time, are the starting point for the following processes with value co-creation as a whole to be considered as a long-term perspective. Building on the above concepts, it can be said that the time dimension develops in the long term for both approaches considered herein and that the value co-creation model allows a clearer understanding of how short and long term concepts highlighted in the sustainability holistic perspective can be reconciled.

Moreover, from another point of view it can be said that co-creation generates effects not only in the short but also in the long-term and, as a consequence, affects the relationships it has with all stakeholders and with the society and the environment as a whole, also because the firm destiny is linked twofold within this context (see section 2.2.). In this sense both the linkability and the evolvability features of ecosystems of capability come about. The first principle clarifies how strong the links are between the firm, the society and the environment at whichever level (i.e., natural, industry, global) and the second considers that ecosystems of capabilities must be built maintaining the possibility of continually generating ever new capabilities at an ecosystem level ([Ramaswamy and Ozcan, 2014](#)). Alternatively, ecosystems of capabilities by their nature evolve continuously together with individuals interacting in engagement platforms, nurturing them thanks to their experiences and capabilities, making the whole system evolve. This brings us to the last principle of the “Sustainability Oriented Theory of the Firm” (principle 10 in the framework), which considers that “the firm and its agents are obligated to recognize that their firm, competitors, legislators, consumers, the environment, and the world, are constantly evolving” ([Lozano et al., 2015](#), p. 440). Moreover, another principle is encompassed in this, the second, which states that “the firm and its system (including operations and production, management and strategy, organizational systems, procurement and marketing, and assessment and communication) are constantly evolving” ([Lozano et al., 2015](#), p. 440). Indeed, it is clear that individuals inside the firm collaborating with individuals outside it co-create value and impact on the whole ecosystem in which the firms operates, but it is also true that the firm, to survive and continue to co-create value needs to continuously change, to reach and dynamically maintain a condition of harmony within its context which also evolves over

time (Golinelli et al., 2011a). The condition of harmony between the firm and its operating context is essential to its survival even if it has to be balanced, at least in the long term, with another driver: the competitiveness (Golinelli et al., 2011b). The latter assures to firms to build and to maintain a lasting competitive advantage and together with harmony and the research of a continuing equilibria between the two drivers falls in the “organo-di-governo” responsibilities. As a consequence the firm can be considered as “a system which survives, remains united and is integral, is homeostatically balanced both internally and externally and possesses mechanisms and opportunities for growth and learning, development and adaptation, which allow it to become increasingly effective within its environment” (Golinelli et al., 2011b, p. 70; Beer, 1985). As a consequence of this though it becomes clearer that leveraging all individual capabilities can also lead to sustainability (Ramaswamy and Ozcan, 2014). Indeed, it can be said that ecosystems of capabilities, nurtured by interactions and value co-creation realized within engagement platforms contribute to sustainability. The latter is affected by both value co-creation and the achievement of CS of firms contributing to the ecosystem of capabilities. In this relationship respecting laws and regulations concerning sustainability also plays a role. This is highlighted by the ninth principle of the “Sustainability Oriented Theory of the Firm” (principle 9 in the framework), which states that both “the firm and its employee can be accused of crimes against sustainability” (Lozano et al., 2015, p. 440).

This same concern regarding laws and regulations to be respected affects the relationship with other stakeholders, including individuals co-creating value with firm employees. All stakeholders influence, directly and/or indirectly, “through a network of relations” firm activity providing or otherwise the so-called “licence-to-operate” (Lozano et al., 2015, p. 440) (principle 5 in Fig. 1). Following the value co-creation approach it is true that the firm should acquire the ability to engage these stakeholders to co-create even if not all of them are perhaps willing to collaborate at the same time. In whichever case, they cannot be forgotten at any time in that they could also influence individuals now collaborating with the firm and conflictual relationships with each of them must be avoided to ensure firm survival over time (Freeman, 1984; Parmar et al., 2010). Indeed, referring to the Viable System Approach it can also be said that to survive the “organo di governo” should be able to “outlin[e] and implement development routes for the enterprise which are consistent -and if possible in harmony -with the context” (Golinelli et al., 2011a, p. 81).

In this sense one must also bear in mind that stakeholder instances must, to some extent, be met balancing them with firm goals also in terms of profits, or rather value creation. This is the content of the seventh principle of the “Sustainability Oriented Theory of the Firm” (7 in the framework) (Lozano et al., 2015). In the value co-creation approach this trade-off between firm profits and stakeholder instances becomes vaguer in that individuals inside and outside firms collaborate to co-create value, therefore they collaborate towards common projects and/or innovations and each of them captures some value that is of personal interest. Indeed, value co-creation continues only if all individuals are rewarded with something they value within co-creation processes: “build it with them, and they are already there” in Ramaswamy’s words (Leavy, 2013, p. 13). Obviously, value co-creation as an individual experience-centric perspective (i.e., Reay and Seddighi, 2012; Ramaswamy and Ozcan, 2013) views firm employees as the only way firms can co-create with individuals outside their boundaries; an assumption shared with the “Sustainability Oriented Theory of the Firm” (Lozano et al., 2015) which considers firm employees as “ambassadors” of the firm (principle 7 in the framework).

The relationship with the firm through its employees and all other stakeholders - considered following an individual perspective-, including those engaged in value co-creation, in this study represents the external social dimension of the CS theory proposed by Lozano et al. (2015) (C1 in the framework). Social CS as a whole can be understood as “the consciousness of responsibility for its own actions as well as an authentic and credible commitment (mostly long term) in all business activities and more aiming to stay successfully in the market for a long time. Social sustainability is aimed to positively influence all present and future relationships with stakeholders. Furthermore, the fulfilment of their needs is focused on for assuring stakeholders’ loyalty for the company” (Ebner, 2008, p. 28; Baumgartner and Ebner, 2010). The external social aspects of CS have been identified in ethical behavior and human rights, no controversial activities, no corruption and cartel, corporate citizenship, while the internal ones must be understood as corporate governance, motivation and incentives, employees health and safety, human capital development (Baumgartner and Ebner, 2010). Therefore, the internal social dimension (C2 in the framework) in the proposed model is made up of both firm activities and resources (principles 3 and 4 in the framework), to be understood as internal “social matters” (Littig and Griessler, 2005, p. 66). Among internal firm components, some relationships exist like those between managers and employees which in the “Sustainability Oriented Theory of the Firm” only concern legal aspects (Lozano et al., 2015) (principle 6 in the framework). In the value co-creation approach this relationship is both wider and more complex, in that employees must be motivated by management who should guide the transformational change needed to embrace the co-creation approach and also provide all tools, structures and means to make employees effectively co-create value (Ramaswamy, 2009b). Another interesting relationship in this context is the one linking firm employees and firm resources, highlighted by the eighth principle of the “Sustainability Oriented Theory of the Firm” (Lozano et al., 2015) (principle 8 in the framework). This principle is similar to that suggested in the value co-creation approach, but is, once again wider than the latter. Indeed employees can holistically integrate resources not only pertaining to the firm but also made available by individuals outside the firm, not only providing it with a competitive advantage, but creating ever expanding value for the firm and the whole ecosystem in which it operates (Ramaswamy and Ozcan, 2014).

The last dimension studied by Lozano (2008a, 2008b, 2012, Lozano et al., 2015) is the environmental one. The ecological dimensions of CS must be understood as the negative impact firms have not to produce on the following aspects of the natural environment: resources (materials, energy) using if/when possible recycled ones, “emissions into the air, emissions into the water, emissions into the ground, waste and hazardous waste, biodiversity, environmental issues of the product” (Baumgartner and Ebner, 2010, p. 79; Taddeo et al., 2017). Within the proposed framework environmental CS links its stakeholders and the individuals collaborating on the engagement platforms; all these actors should consider environment protection in their activities. Indeed, collaboration between the firm and its stakeholders should also help reduce environmental and social impacts, in accordance with Lozano’s theories (Lozano, 2008b). In addition environmental concerns should be considered by all individuals collaborating in co-creation and awareness of environmental issues is even more widespread, above all amongst customers. They are

increasingly seeking sustainable products and are ready to sanction firms not complying with environmental rules or who are involved in any way in environmental damage and/or concerns (i.e. palm oil and deforestation).

The four dimensions of CS as well as the ten principles of the “Sustainability Oriented Theory of the Firm” (Lozano et al., 2015) combined with the value co-creation approach following a strategic perspective (i.e., Ramaswamy and Ozcan, 2014) show how CS can actually be fully incorporated in the latter. This shows that CS can really be achieved through an up-to-date strategic perspective aware of the challenges firms must make in the present complex scenario, while also taking advantage of established “theories of the firm”.

4 Conclusion

The paper aims at putting forward a new framework integrating for the first time the key features of the recently proposed “Sustainability Oriented Theory of the Firm” into the value co-creation approach, without forgetting the role of innovation and the contribution firms could provide to build bio-economies.

The main contribution of this theoretical paper is the attempt to integrate the “Sustainability Oriented Theory of the Firm” (Lozano et al., 2015) principles and considered CS dimensions in an up-to-date strategic approach able to encompass both innovation and sustainability issues.

In doing this the paper contributes to the holistic approach proposed by Lozano et al. (2015) and Please insert "by" here this way to literature on CS. Integrating the principles and the identified CS dimensions in a basic value co-creation framework also helps appreciate the ability of the latter approach to be aware of both the challenges firms face today and the complexity of the scenario in which they conduct their activities. Moreover, assuming a micro perspective, the paper sheds light on how firms could contribute to the transition to bio-economies, fostering sustainability. In fact, one of the contributions of the proposed framework is to make even more clear which are the relationships among the different CS dimensions. It also allows to identify the key aspects to manage to achieve the expected goals for both each CS dimension and for CS as a whole. In doing this the framework also allows to take into account the four core principles in creating ecosystems of capabilities: inclusivity, generativity, linkability and evolvability (Ramaswamy and Ozcan, 2014). These develop at a higher level and therefore are able to build capabilities to which individuals can easily access; this could help in fostering sustainability in the whole society and make the transition to bio-economies easier.

From a managerial point of view, bridging the “Sustainability Oriented Theory of the Firm” (Lozano et al., 2015) and the value co-creation approach could help managers form a comprehensive view of firm activities, able to fully encompass CS issues. Indeed, the framework should be useful to firms to combine and manage different and equally important strategic issues as CS and innovation, which have not be understood as trade-offs, but as demands to be simultaneously satisfied through a more complete and comprehensive approach.

The paper, as an initial step to integrate the two considered approaches has some limitations and opens new avenues of research. The first limitation has to be identified in the lack of the validation of the proposed model which could be performed thanks to a case study, to be understood as a future avenue of research. A further step for future research could be to study the proposed approach in greater depth to please insert "better" further understand all the common traits of the two considered approaches from a theoretical standpoint. Indeed, this represents another limitation of the present study which is only a first step in this field of research. After having validated the framework, also a longitudinal case study should be performed to understand how it works over time, which are the critical points on which is essential to focus the attention in implementing it and which are the real benefits its implementation can produce at a firm level as well as at an ecosystem of capabilities and a social level.

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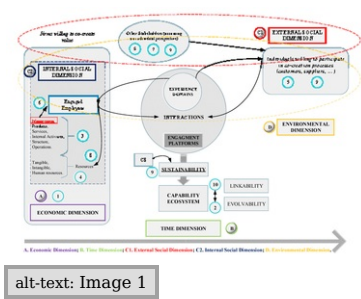
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Graphical abstract



Highlights

- Bio-economies are studied assuming a firm perspective.
- An integrative model of corporate sustainability and value co-creation is presented.
- Innovation and sustainability – touch-points of bio-economies and business models - are considered.
- Corporate Sustainability dimensions can be encompassed in the value co-creation model.
- The “Sustainability Oriented Theory of the Firm” principles can be respected in value cocreation.

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