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Circular Economy as an emergent form of economic and social exchange: A new theoretical framework to study the circular economy diffusion

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Abstract

This conceptual article argues that circular economy should be incorporated into research, represented in a novel way as a form of economic and social exchange characterized by distinctive features. Building originally on work concerning diffusion sociology and cultural analysis of markets, it proposes to study cultural and social networks mechanisms of the circular economy to enhance the understanding of its diffusion dynamics. Three distinctive features of circular economy are introduced and illustrated with examples. The article concludes offering reflections for scholars on the potential way to shed light on the cultural and social mechanisms that may explain the circular economy's diffusion in the economy in general, as a form of economic and social exchange.

Keywords: Circular Economy, culture, social networks, circular economy diffusion

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1. Introduction: CE as a new form of economic and social exchange

Circular Economy is a response to the quest for improving the sustainability of production, exchange, and consumption activities. Circular Economy makes it possible to reduce the use of resources and to keep materials within the production system by, for example, recycling them (Franklin-Johnson et al., 2016). The 'take-make-waste' approach (Brydges, 2021; Esposito et al., 2018; McDowall et al., 2017; Ellen MacArthur Foundation, 2017) is based on extracting resources from the earth to make products, using resources in production, selling products, and treating discarded products as waste. Compared to the 'take-make-waste' approach that widely characterizes extant markets, Circular Economy (CE) emphasizes the utility of by-products or discarded products, as inputs to 'other' markets rather than waste. In other words, CE connects multiple markets via 'take-make-reuse' ties that carries resources through various production and consumption activities. The circular economy, based on a take-make-reuse approach, is an economic system that replaces the 'end-of-life' practice by reducing, reusing, recycling and recovering materials in different processes (Mhatre et al., 2021).

Prior studies indicate that CE promotes environmental efficiency and contributes to reducing the impacts of climate change (Xue et al., 2019; Enkvist et al., 2018; Ellen MacArthur Foundation, 2019). For example, shifting to CE can reduce greenhouse emissions by up to 70% (Stahel, 2016). Furthermore, CE creates positive cascading effects on the economy in terms of innovation (Bocken et al., 2016), the emergence of novel markets (Esposito et al., 2017), and the creation of new jobs (Korhonen et al., 2018).

Despite the advantages presented in the literature, the diffusion of CE in the economy is limited (Haas et al., 2015; McDowall et al., 2017; Kirchherr et al., 2018; Ngan et al., 2019; Pieroni et al., 2021; Silvestri et al., 2020; Stahel, 2016).

With the aim to suggest exploring the critical factors that account for the diffusion of CE in the economy, this article proposes a novel representation of CE as a form of economic and social exchange (Granovetter, 1985) that shows three distinctive features:

i) CE implies unprecedented levels of cooperation, either within or across markets.

ii) CE requires actors to evaluate the morality of 'reuse' as opposed to 'waste'.

iii) CE demands cognitive flexibility on the part of individual actors, who are supposed to play multiple roles in the market (e.g., consumer or seller).

These three distinctive features characterize CE as a new form of economic and social exchange and as a contemporary phenomenon intertwined with social networks, beliefs, and cognition. This article argues that understanding the dynamics related to social networks, beliefs, and cognition regarding CE makes it possible to comprehend the multi-level critical factors that account for the CE diffusion in the economy. Having said that, the innovative contribution of this conceptual paper is to build originally on work concerning the diffusion sociology theory and cultural analysis of markets to understand the mechanisms that may facilitate the diffusion of CE in the economy.

The article provides a multi-level theoretical framework to explore why, how, and to what extent emergent forms of economic and social exchange get traction.

The role that social networks, beliefs, and cognition may have as explanatory factors of the CE diffusion can be explored through two original theoretical lenses. Specifically, this article integrates, in a novel way, two independent strands in the field of sociology of markets. On one side, it considers diffusion studies (Burt, 1987; Rogers, 2003) — emphasizing how ideas, beliefs, or material artefacts travel through interpersonal ties. On the other side, it is based on the cultural analysis of markets (DiMaggio, 1997; Zerubavel, 2009) — highlighting how socially-derived beliefs† and cognitive maps‡ shape the organization of fundamental economic and social activities such as cooperation.

Recently, the literature has pointed out that the CE's impact depends on non-contractual forms of interrelationships and social ties among actors (Fassio and Tecco, 2019; Zhijun and Nailing, 2007). Considering this development, the sociology of markets literature may be a suitable lens to articulate the roles and relationships that sustain the CE's diffusion. As part of this theoretical stream, studies on diffusion models (Burt, 1987; Rogers, 2003) show the emergence of new forms depends on the topology of social networks involving market actors (Centola & Macy, 2007; Frey & van de Rijt, 2020; Ruef, 2004). However, such studies pay limited attention to the cultural infrastructure surrounding one's decision to adopt a particular behavior, such as taking part in CE. This paper argues that emphasizing the role of culture in the diffusion processes is essential to understand when social influence turns into adoption. This is relevant as the CE diffusion cannot be successful unless individuals, companies, and other stakeholders, who are the key actors of the CE approach, are culturally and morally grounded in supporting CE.

The paper is based on the view that the sociology of markets theory and the cultural analysis of markets perspective enables us to appreciate the three distinctive characteristics of CE as a new form of economic and social exchange and, ultimately, the critical factors that may account for the CE diffusion. The ultimate goal of studying the CE diffusion is to unveil how the characteristics of social networks may affect the CE diffusion within and across networks, based on the cultural elements that characterize their actors (e.g., consumers, producers, etc.).

For that reason, the aim of this article is to provide with an original theoretical approach conceptual guidelines to understand the critical factors of the CE's diffusion.

The article first introduces the three distinctive features of the circular economy with respect to the traditional, linear economy by also providing some examples. Then, the sociology of markets theory on diffusion studies and the cultural analysis of markets will be presented to illustrate how they can support the comprehension of the emergence of CE as a novel form of economic and social exchange. Finally, the

† Beliefs are units of knowledge representing an association between two things, most often a cause-effect association (Corner et al., 1994).

‡ A cognitive map represents an individual's causal beliefs about and assertions about external reality. Typically, a cognitive map is portrayed as a set of concepts/nodes tied together by causal relationships/arrows (Helfat & Peteraf, 2015).

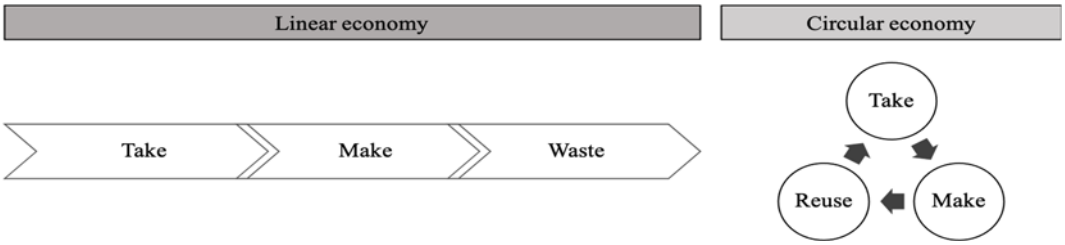
paper highlights some limitations and proposes new ideas for future research based on the proposed theoretical framework.

2. The three distinctive features of the circular economy

2.1 The unprecedented levels of cooperation, either within or across markets, in the circular economy.

The 'take–make–waste' approach dominates extant markets (Esposito et al., 2018; McDowall et al., 2017) and poses serious sustainability concerns. Within 2050 the global population will reach 9,7 billion (UN, 2019); the use of *de-novo* materials has been estimated to grow from 89 billion tonnes in 2017 to 167 in 2060 (OECD, 2018); the quantity of waste is expected to grow by 70% within 2050 (Kaza et al., 2018). Circular Economy (CE) attracts scholars' attention (e.g., De Giacomo and Bleischwitz, 2020) because it offers a viable and effective response to global-scale environmental concerns. In simple terms, CE is a form of economic and social exchange that departs from the linear economy in two fundamental ways. First, CE emphasizes the value of a commonly considered by-product or discarded product (Stahel, 2016). Second, it stresses that what is waste for market *i* can be a valuable input for market *j*. Thus, the diffusion of CE manifests in 'take-make-reuse' ties that connect otherwise disconnected markets and carries the same resource through multiple production and consumption activities (Figure 1).

Figure n. 1 – Pictorial representation of alternative economic and social exchange forms.



Source: elaboration from the author

A sector characterized by high cooperation among different markets and actors is, for example, the food sector that is one of the main wasteful ones, as around 20% of all produced food becomes waste in the EU (Scherhaufer et al., 2018). There are numerous CE examples in this sector. They include cooperatives that compost food waste, like 'Il Giardinone' in Italy, which composts coffee capsules and granules to use coffee waste for mushroom production. Il Giardinone cooperated in a circular economy project with one of the Italian leading coffee companies, a chemical company

working in the sector of bioplastic, and an Italian university. For the different actors involved, what is considered a waste (for example from the coffee industry) becomes an input, i.e., a by-product, to be valorized in a new production process for another company. Among the objectives of Il Giardinone, we can mention the reduction of CO2 emissions and lower costs related to logistics and disposal. Consumers may also benefit from new innovative sustainable and high-quality products.

Or companies that convert food waste into renewable energy (as the case of 'Biogen' in the UK); or enterprises that process used edible cooking oil and fatty food waste into recycled materials for a variety of industry sectors. For example, 'Brocklesby Ltd' provides a UK Nationwide restaurant collection service for used cooking oils and fats. The company offers returns to restaurants for the collected oils and fats.

Another example of strict collaboration among actors of the CE markets is the packaging sector. Private consortiums — which guarantee that packaging producers and users comply with recycling/reusing activities — involve multiple actors in packaging waste management. Packaging producers are involved in the circular design of products with the support of research centers; there are packaging suppliers who distribute packaging; packaging users that benefit from safe and high-quality products, take part in recycling activities and enable the reuse of end-of life products; public administrations that establish rules for waste management at the local level.

Another example of strong collaboration between different actors is the plastic sector, where there is a need for urgent transition (Geng et al., 2019; Simon, 2019). The 'New Plastic Economy' (Vlugter, 2017) is based on the idea that plastics should never become waste and, instead, they have to return to the economy as nutrients. There are some collaborations along with entire value chains in this sector, which include multiple actors, such plastic raw materials producers — which need to rethink the design of products in a more environmental-friendly way —, plastic distributors and users, plastic waste collectors, and plastic waste operators (e.g., Paletta et al., 2019) who have to properly treat plastic waste to respect the CE principles.

The textile sector is a highly polluting industry (Sandin & Peters, 2018). This market presents numerous challenges in adopting a CE approach, from product design to reprocessing (Franco, 2017). For example, clothing is massively underutilized, as fast fashion encourages overconsumption and waste generation (Pieroni et al., 2021). Making the sector more circular implies a system-level change by engaging multiple stakeholders and new forms of collaboration (Fischer & Pascucci, 2017), recalling new roles with respect to a traditional linear model of economy (e.g., a cloth user can become a cloth seller, when decides to put into the market his/her old cloth and make it available to new customers). A single individual may belong to multiple customer types at the same time, and this reflects sales and service models that imply multiple relationships among the actors of this value chain. To cite a key example, the textile case of Prato district (Italy) represents a historical CE model that is well established in the culture of Prato people. This model is based on the recycling of used cloths, which are re–used, thanks to historical techniques based on textile recovery in new production cycles.

All the above-mentioned examples suggest the need for future research to i) explore different factors (related to culture and social networks) that explain these collaborative initiatives and, ii) shed light on the collaborations and synergies along entire value chains.

2.2 The morality of 'reuse' in the circular economy

A second distinctive feature of this new form of economic and social exchange is individuals' moral responsibility for CE. Morality includes beliefs individuals hold regarding the moral status of 'reusing' – one of the key principles of CE – as opposite to 'wasting'. Indeed, in the CE form, actors are not only called to judge the morality of production (make) and consumption (take), but they also have to assess if recycling (reuse) is in concert with their values.

The moral responsibility theory of corporate sustainability (Ha-Brookshire, 2015; 2017; Lee et al., 2018) argues that the extent of companies' commitments toward sustainability is based on how they perceive sustainability itself (Jung and Ha-Brookshire, 2017). According to this theory, the degree of a corporation's commitment and actions toward social and environmental goals depends on its views on sustainability in terms of its moral responsibilities. In the case of CE, we can argue that the level of individuals' (companies included) commitment towards CE is based on how they perceive CE in terms of moral responsibilities or obligations (Planing, 2015). Moral obligations are subjective and expected to be a determinant of the individual acceptance of CE and, consequently, of the individual participation in CE. In other words, the morality individuals attribute to CE determines whether it is right or wrong to take part in the same. Individuals have a moral responsibility towards society and the environment. They can decide their commitment towards CE through the perceived moral obligation to adopt a certain behavior that affects the CE approach. Individuals may have different beliefs regarding CE, which means they may have diverse commitments towards it. Beliefs refer to morally supporting the CE approach and feeling 'obliged' to participate in the CE markets (Ki et al., 2021). For example, some companies may see themselves as responsible (Ha-Brookshire, 2017) through their actions and strategies for meeting sustainability objectives, whereas others may feel not morally responsible. Similarly, individuals' moral stance on CE enables them to understand how they see CE from a moral responsibility standpoint. Morality concerning circular economy is relevant for its diffusion since, without a sense of moral responsibility of individuals or companies who take part in the market, CE cannot occur (Ha-Brookshire, 2017).

Beliefs regarding the morality of CE can be positive – individuals think that the moral status of 'reusing' is superior to the moral status of 'wasting' – or negative. The moral status each individual or company attributes to CE affects, in different ways, his/her behavior towards CE-related aspects (Jung and Ha-Brookshire, 2017; Lee et al., 2018). The consequence is that beliefs individuals have regarding CE affect the CE diffusion in the economy. Beliefs regarding CE refer to how they judge the merits of different actions and activities based on the CE principles. For example, this kind of

judgment affects creating new CE markets (Gregson et al., 2015). In other words, the extent to which a market actor, being a company, a consumer, a public organization, or an individual, morally supports CE-related issues affects his/her decision to take part in CE.

CE is characterized by high collaboration among actors within and across markets. Such collaboration implies that an individual's contribution to CE also relies on the moral status his/her connected actors attribute to CE (Ha-Brookshire, 2017).

2.3 The cognitive flexibility of the individual actors

The third distinctive feature of CE as a novel form of economic and social exchange is that it demands cognitive flexibility on the part of individual actors, who are supposed to play multiple roles in the market. New forms of collaborations among different actors in CE involve new roles with respect to a traditional linear model of economy (e.g., a cloth user can become a cloth seller when he/she decides to put into the market his/her old cloth and make it available to new customers). A single individual may belong to multiple customer types at the same time, and this reflects some sales and service models implying multiple relationships and networks among the actors of this value chain. Recent contributions pointed out that the viability of CE as a socio-economic arrangement largely depends on non-contractual forms of coordination, such as networks, and the ability of actors to play multiple roles (Ghisellini et al., 2016). For example, considering that scrap from food can be re-used in the design of new clothes, families are both consumers in the food market and sellers in the textile market. This probably can be thought of as one of the compounds of cultural elements, such as individuals' moral stance regarding CE.

Interpersonal connections can also shape role structures (White 1981) – e.g., 'consumer' or 'seller' – which act as devices of market stability by creating expectations about the behavior of the parties involved in a transaction. For example, Aspers' distinction (2011) between fixed- and switching-role markets can be used to emphasize the fact that CE is characterized by a loose connection between actors and roles.

3 The theoretical approaches to understand the diffusion of the circular economy

Over the last few years, research has made considerable efforts to characterize CE *vis a' vis* the traditional 'take-make-waste' approach (EC, 2020, Ellen MacArthur Foundation and McKinsey, 2014; European Investment Bank, 2020; Homrich et al., 2018). A part of the literature on sustainable management deals with the determinant of circular economy (Khan et al., 2020; Gusmerotti et al., 2019). More recently, scholars have also started to investigate the factors that facilitate the diffusion of CE. Several articles (Doménech et al., 2019; Ghisellini et al., 2016; Tseng et al., 2018) indicate that CE's adoption depends on informal, spontaneous coordination forms

grounded in social relations among market actors (Geng et al., 2019). In light of these results, the sociology of market literature§ (Bourdieau, 1993; Granovetter, 1985; White, 1981) offers a promising theoretical lens to get a closer understanding of the three distinctive features of CE – highlighted in the introductory section and presented in the previous paragraphs – and how these features can affect the diffusion of CE in the economy.

Diffusion studies – an integral part of the sociology of market literature - shows the emergence of new forms depends on three key factors: *i)* the connectivity of early adopters, a class of actors with distinctive attributes, and fresh action (Coleman et al., 1957); *ii)* the topology of concrete social networks through which diffusion occurs (e.g., Centola et al., 2007; Eagle et al., 2010; Frey & van de Rijt, 2020) – for example, the existence of cohesive communities of actors within a network is a factor that constraints the diffusion process (Watts & Strogatz, 1998); *iii)* the process of social influence that links one's attitude towards the new form with neighbors' action (Friedkin & Johnsen, 1990, 2011; Watts & Dodds, 2007).

However, the literature on diffusion pays limited attention to the cultural infrastructure surrounding one's decision to adopt a novel behavior – e.g., providing a steady supply of quality left-over food to bioenergy production companies. Articulating the role of culture in the diffusion processes is essential to understand when social influence turns into adoption. For example, the proportion of adopters in one's social circles can spur conformance. Yet, not all interpersonal ties are created equal: one will attribute more value to the behavior of contacts that are culturally similar to him/her (Festinger, 1954). Furthermore, the behavior at risk to spread might pose ethical or social issues that require one to judge the moral value of adopting the new behavior (Fitzmaurice et al., 2020; Fourcade and Healy, 2007). Also, the novelty/complexity of the new behavior might create a gap between one's attitudes and behavior. For example, actors who concur on CE's merit may not take part in it because of the lack of understanding of how such a new form of economic and social exchange works.

At the core of this article, the theoretical framework integrates key conceptual categories and tools from the domains of culture and networks to create a fresh and granular understanding of the CE antecedents.

The following two sections illustrate some critical elements of diffusion studies and the cultural analysis of markets, two integral components of the sociology of markets theory.

§ This literature explains market outcomes based on the characteristics of the social structure within which actors are embedded. Social structures are characterized by extensive social relationships among actors and how those relationships influence individual economic actions (Granovetter 2017).

3.1 Sociological studies on diffusion and the circular economy

Recently, scholars have started to inquire into the factors that facilitate CE's adoption. In so doing, they have assigned a pivotal role to the informal, spontaneous forms of coordination grounded in social relations among market actors (Corvellec et al., 2020; Geng et al., 2019). In light of these insights, this paper argues that the sociology of markets literature (Bourdieau, 1993; Granovetter, 1985; White, 1981) offers a promising theoretical lens to get a closer understanding of CE's distinctive features and how these features can affect the diffusion process. Specifically, such a theoretical apparatus explains market outcomes based on the characteristics of the social structure within which actors are embedded (Granovetter 1985; 2017). For example, in her review of the literature, Fourcade (2007: 1201) highlighted that:

"[interpersonal connections act as] interactive mechanisms that stabilize markets: they help information circulate, stabilize incentives, and engineer the trust or generalized morality without which market exchange would not even be possible."

Interpersonal connections can also shape role structures (White 1981) — e.g., being a 'consumer' or a 'seller' — that act as devices of market stability by creating expectations about the parties' behavior in a transaction.

Social networks are consequential for the diffusion of new behaviors or material artifacts (Centola, 2015; Macy and Willer, 2002 Newman et al., 2006; Park et al., 2018). Particularly, prior studies show that diffusion processes depend on three critical factors:

1. Key network positions, namely, early adopters (Coleman et al. 1957).
2. The topology of concrete social networks (e.g., Centola and Macy, 2007; Eagle et al., 2010; Frey and van de Rijt, 2020; Shi and Macy, 2016) — for example, the existence of cohesive communities of actors within a network is a factor that constraints the diffusion process (Watts and Strogatz, 1998).
3. Social influence mechanisms (Friedkin and Johnsen, 1990; Watts and Dodds, 2007), which make one's attitude intermesh with the behavior of her or his neighbors.

However, diffusion studies pay limited attention to cultural elements that may affect individuals' decisions to adopt a certain behavior.

3.2 A cultural analysis of markets and the circular economy

Culture is ubiquitous in the social sciences, and its application frequently raises construct clarity issues. This paper builds on McLean's (2016) critical review of the field of cultural sociology, which conceptualizes culture as a multi-facet construct instead of a unitary one. This article concentrates on two crucial facets of culture: the set of beliefs that orient actors' judgment about CE's morality; the collection of cognitive maps that actors use as mental representations of how CE works.

In this perspective, the conceptual category of beliefs is particularly central. Media frequently portray CE as a response to sustainability problems. Thus, actors tend to evaluate CE's moral status — especially 'reuse' — against the standards of the linear economy (Fitzmaurice et al., 2020; Fourcade and Healy, 2007). In contemporary

societies, such an evaluation problem is a 'novelty' and, therefore, presents ambiguities that make the decision-making process more judgmental than rational (Simon, 2013 [1947]). Hence, beliefs can act as cognitive shortcuts that promote action (DiMaggio, 1997) by allowing one to quickly address fundamental questions such as: 'Should I take part in CE?'

Along with beliefs, cognitive maps also help market actors navigate uncertain or ambiguous situations, such as developing a new socio-economic arrangement. However, cognitive maps are more complex than beliefs, which are stripped-down propositions expressing probability, inference, or association. Cognitive maps are knowledge representations that describe the organization and functioning of complex systems (e.g., organizations, markets) in a stylized matter. They contain concepts connected within smooth narratives. For example, cognitive maps can regard the ecology of roles that populate CE and the mapping between roles and actors (Zelizer, 2013; 2017). Thus, cognitive maps assist market actors in addressing questions such as: 'How do I engage with CE?'

Understanding how market actors evaluate CE's adequacy to respond to sustainability issues and how they represent CE as an emerging form of organization and the functioning of economic and social exchange would enable scholars to achieve multiple objectives. Specifically, it would lead to a collective understanding of the collaborative practices that develop in a CE economy. Moreover, it would relate categories of market actors (e.g., families) with market roles (e.g., consumers become 'users' and 'creators'; Stahel, 2016). Finally, it would link culture — at the heart of many diffusion processes (Rogers, 2003) — with individual actors' decision to participate in CE, to what extent, and in which capacity.

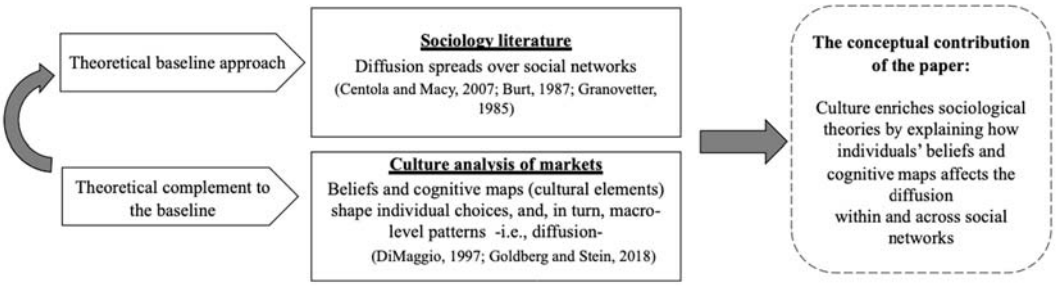
To conclude, both beliefs and cognitive maps help interpret a specific socio-economic form (Navis and Glynn 2010; Rosa et al. 1999) and make meaningful choices about the extent and capacities to engage with CE (Henry and Dietz 2012).

A cultural analysis perspective (DiMaggio, 1997) may help future scholars understand how market actors evaluate the adequacy of CE to respond to sustainability issues and how market actors represent CE as an emerging form of organization and functioning of economic and social exchange. Specifically, a cultural theoretical view of CE would enable exploring the beliefs that market actors have on CE's adequacy as a response to the sustainability problem in production and consumption activities. From a cultural perspective, it would be possible to chart the cognitive maps (DiMaggio, 1997; Porac et al., 1989; Zerubavel, 2009) that actors use to mentally represent CE's organization and functioning as a new form. The attention revolves around how beliefs, cognitive maps, and information exchange networks (jointly) facilitate and sustain concrete CE initiatives.

Exploring the cultural elements of CE would shed light on the set of beliefs against which actors evaluate CE's moral status along with the cognitive maps associated with the organization and functioning of CE. Together, these elements would clarify the cultural background that orients individual choices concerning participation in CE and the extent of the engagement. Specifically, adopting a cultural analysis of CE will enable to explore multiple aspects. Firstly, it makes it possible to uncover the set of beliefs about CE's adequacy as a response to the problem of sustainability in

production and consumption (i.e., the moral status of 'reusing' compared to the moral status of 'wasting'). Secondly, it would appreciate the variation in beliefs across different categories of actors and geographical groups. Thirdly, it reveals the set of concepts and relations among concepts included in the cognitive maps through which actors represent CE's organization and functioning. Fourthly, it assesses the variation in cognitive schemas' sophistication across different categories of actors and geographical groups. Indeed, beliefs and cognitive maps individual actors have regarding CE may differ. Specifically, beliefs about CE can be i) homogeneous and negative (individuals agree that the moral status of 'reusing' is inferior to the moral status of 'wasting'); ii) homogeneous and positive (individuals agree that the moral status of 'reusing' is superior to the moral status of 'wasting'), or iii) polarized (two subgroups of individuals hold opposite beliefs about the moral status of 'reusing' relative to 'wasting'). Individuals also differ in terms of the cognitive maps they use to represent CE's organization and functioning. Specifically, cognitive maps can be i) structured or unstructured (according to the number of concepts included in the map and the set of arrows linking concepts); ii) shared or unshared (according to the ecology of different CE-related cognitive schemas that co-exist in the economy).

Figure n. 2 – The conceptual contribution of the paper.



Source: elaboration from the author

4 Conclusions

The theoretical framework at the core of this article integrates key conceptual categories and tools from the domains of culture and networks to suggest a fresh and granular understanding of CE antecedents. Particularly, this paper suggests a novel perspective to study circular economy. Specifically, the study represents CE in a novel way as a form of economic and social exchange characterized by distinctive features. CE implies high levels of cooperation, either within or across markets. Moreover, it requires actors to evaluate their moral responsibility towards CE. Finally, it demands cognitive flexibility on the part of individual actors, who are supposed to play multiple roles in the market (e.g., consumer or seller). These distinctive characteristics of CE

as a new form of economic and social exchange represent CE as an emergent phenomenon intertwined with social networks, beliefs, and cognition. Although this new phenomenon may create multiple benefits at the economic and environmental levels, its diffusion in the economy is still limited. This paper argues that exploring social networks, beliefs, and cognition regarding CE, i.e., multi-level mechanisms, could be a novel and comprehensive way to understand the critical factors that account for the CE diffusion in the economy. To explore these factors, the paper suggests adopting an original and novel theoretical framework based on studies concerning the sociological theory on diffusion and the cultural analysis of markets. Such a new approach will make it possible to appreciate how different configurations of cultural elements – beliefs and cognitive maps market actors have on CE – and networks - interpersonal ties through which culture travels – may help appreciate the different CE diffusion pathways.

The approach proposed in this article suggests exploring the multiple cognitive maps and the different beliefs that markets actors have regarding CE. Such empirical advancement in the extant studies will make it possible to integrate sociological studies on the diffusion of new forms by completing them through a cultural explanation on how CE spreads and diffuses in the economy. On one side, different topologies of social networks may explain how new forms spread over networks, based on their characteristics. On the other side, cultural aspects provide a richer representation of how CE spreads, based on the moral responsibility individuals feel towards CE, and how individuals represent CE's functioning and the roles actors may play in circular markets.

This article provides some original and novel contributions. Firstly, it suggests a multi-level theoretical framework that bridges the cultural and relational analysis of markets to explain why, how, and to what extent emergent forms of economic and social exchange get traction. Secondly, it suggests how future studies may generate a granular and multi-facet representation of the pathways through which CE spreads within and across markets.

5 Limitations and future research

The paper has also some limitations. Firstly, as it is a conceptual paper it presents an original theoretical contribution to studies on the CE's diffusion but does not include any methodological section. Secondly, as it offers a rich and new theoretical framework to explore the CE's diffusion dynamics, it does not indicate in detail how to empirically investigate culture and networks mechanisms related to the CE diffusion.

For these reasons, future studies may explore empirically different aspects related to the cultural and network dynamics that may support or hinder the CE's diffusion in the economy. Firstly, to appreciate the cultural aspects of CE, future research may explore the beliefs that market actors have regarding CE's adequacy as a response to the problem of sustainability in production and consumption activities. It would be interesting to chart the cognitive maps (DiMaggio, 1997; Porac et al., 1989; Zerubavel,

2009) that actors use to mentally represent CE's organization and functioning. Secondly, researchers may also investigate the processes through which culture — i.e., beliefs and cognitive maps — and information exchange networks (jointly) shape individual CE initiatives, and the rate and extent of the CE diffusion in the economy. Such a new approach based on a sociological and cultural perspective will enable the scientific community to appreciate how different configurations of culture and networks map alternative CE diffusion pathways.

The CE diffusion in the economy can be explored by considering an economy as a collection of markets. Each market is a community in a sociological sense — socio-economic exchange is dense within individual communities, whereas it is limited or absent across the boundaries of any two different communities. Indeed, markets are characterized by different relationships. To explore how CE spreads across and within markets, this paper suggests studying different aspects. Firstly, the proportion of connected markets via 'take-make-reuse' ties (for example, those based on traditional or hybrid relationships). Secondly, the strength of the connections linking markets – i.e., the extent to which market 'i' supplies market 'j' with resources that would have been discarded in a 'take-make-waste' approach.

Regarding the social network of interaction among market actors of CE, future research could reflect different 'basic' topologies that have been widely investigated in the field of network science. Specifically, each combination of cultural elements could be observed under four topologies: i) random network (interactions among market actors are randomly distributed across dyads — i.e., there is no theoretical process that guides inter-personal tie formation, maintenance, or dissolution; see Erdös & Rényi 1959); ii) small-world network (interactions primarily develop within small, cohesive clusters, while different clusters are connected via few and sparse ties; see Watts & Strogatz 1998); iii) grid network (interactions involve a limited number of proximal contacts); iv) scale-free network (the large majority of actors have few ties, while a limited number of actors have a very high volume of ties that are responsible for the connectivity of the network; see Barabási & Bonabeau, 2003). CE is expected to spread widely in this network if hubs adhere to this form because they have a lot of connections (Barabási 2009), provoking the so-called cascading effect, i.e. the chain reaction bringing a cascade of adoptions of CE new form. Exploring cultural elements under different social networks could be relevant as, based on their characteristics, they may affect in different ways the diffusion of new types of behavior or material artifacts (Centola, 2015; Macy and Willer, 2002 Newman et al., 2006; Park et al., 2018) on CE.

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