

# CONTRIBUTIONS OF COOPERATIVES TO THE CHALLENGES OF THE CIRCULAR ECONOMY AND PRODUCT-SERVICE SYSTEMS IN THE CONTEXT OF ENVIRONMENTAL TRANSITION

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## 1 Introduction

The recent and current global environmental and social challenges are leading us to rethink the configuration of economy and society, in the perspective of balancing climate and ecological considerations with socio-economic concerns. The literature refers to this as transformation or transition toward sustainability, defined as “fundamental changes in structural, functional, relational, and cognitive aspects of socio-technical-ecological systems that lead to new patterns of interactions and outcomes” (Patterson et al., 2017, p. 2). These terms are also gaining in popularity in the public discourse, following the publication by the United Nations of the set of the 17 Sustainable Development Goals to be achieved by 2030 (Patterson et al., 2017).

Nevertheless, the economic models that will allow a transition to more sustainable societies are yet to be firmly established. Among those models, Product-Service Systems (PSS) are believed to be among the systems able to contribute to the challenges of this transition (Roman, Thiry, Muylaert, Ruwet, & Maréchal, 2023). PSS are defined as business models selling a service that a product provides without the need for the user to own the product itself (known examples of PSS are clothing libraries, care sharing, or rental services).

So far, PSS have mainly focused on economic and environmental dimensions (Annarelli, Battistella, & Nonino, 2016). This is understandable as PSS are often associated with the circular economy (Van Niel, 2014) that breaks with the present dominant paradigm of the linear economy (Boutillier, Laperche, & Picard, 2014) that adopts a take-make-waste perspective. However, the actual contribution of PSS to environmental sustainability is not yet unequivocally established, and there is no empirical evidence of widespread better environmental performance (Roman et al., 2023; Kjaer, Pigosso, Niero, Bech, & McAloonon, 2019; Annarelli et al., 2016). Furthermore,

so far, there are various firms that implement PSS only as it improves their competitiveness and profitability but without any environmental concerns (Graça, 2021; Vaileanu-Pau & Boutillier, 2012); in some cases, it may generate positive externalities in terms of environment, in others, not at all. It therefore appears that this model, although promising sustainability, is already being misused by some traditional companies. Finally, the contribution of PSS to the transition may be limited due to their poor ability to recruit and retain enough consumers (Tunn, Bocken, Van den Hende, & Schoormans, 2021; Roman et al., 2020; Hazée, Delcourt, & Van Vaerenbergh, 2017), jeopardizing their economic viability. Indeed, it has been shown that consumers often prefer to retain control over the goods they use (Tukker, 2015; Catulli, 2012; Intlekofer, Bras, & Ferguson, 2010; Halme, Anttonen, Hrauda, & Kortman, 2006). This is one of the obstacles to consumer take-up of PSS offers. In this respect, the ability of PSS to be an economically viable model applied on a significant scale remains a major challenge.

Today, there is a consensus that we have to rethink the configuration of our economy toward more sustainable models. To achieve this, economic, environmental, and social dimensions have to be simultaneously taken into account. For those reasons, this chapter postulates that if PSS firms really wish to favor a transition toward more sustainability, they should adopt the concept of triple bottom line (TBL) developed by Elkington (1998) encompassing environmental integrity, economic prosperity, and social equity. This is in line with some of the findings of Gatersleben (2001) in an empirical study where she shows that people will be more inclined to accept environmental consumption alternatives if the social dimension is also taken into account.

In terms of potential positive environmental effects, PSS offer the potential to reduce waste associated with production and consumption while promoting end-of-life options (Bal & Satoglu, 2020), such as refurbishment and re-use, which are key elements of circular economy-related strategies (Haber & Fagnoli, 2021). By making a good available to multiple customers (simultaneously or sequentially), the PSS model also intensifies the use of goods (Roman et al., 2023; Tukker, 2004) and may favor in some cases a more conscious use of the product (De Jesus Pacheco et al., 2022), less energy consumption through for instance the sharing of infrastructures (Sarancic, Pigosso, Pezzotta, Pirola, & McAlloone, 2023), and prevention of pollution (Blüher et al., 2020). Regarding positive economic effects, Sarancic et al. (2023) mention that PSS offer the possibility to obtain additional, more predictable and recurring revenue streams. Finally, regarding social aspects, we can mention that PSS may offer an access and a use to resources that some citizens would not be able to own (Sarancic et al., 2023).

Some papers have examined the link between PSS and TBL. Nevertheless, our review of the literature has led us to argue that the definition of TBL is often too generic. Indeed, even when some authors such as Tseng et al. (2019) or Kondoh et al. (2014) use TBL to analyze whether PSS are sustainable or not, they often do not refer to any precise TBL criteria. Furthermore, not all authors use the same indicators. As an example, Ries et al. (2023) take emissions and pollutants as environmental indicators while Sarancic et al. (2022) take product longevity. Finally, we must recognize that the social aspect of the TBL is little discussed and developed in studies on PSS (Blüher, Riedelsheimer, Gogineni, Klemichen, & Stark, 2020). In addition, TBL seems to be used above all to analyze the environmental side, leaving the social one largely untouched (Lee et al., 2012). But, as mentioned by Halme et al. (2004, p.125) “there is the need for a concept of sustainable services in which the social sustainability aspect is also recognized with equal attention”.

This leads us to suggest the following research question: Could PSS supplied by social economy cooperatives better contribute to a TBL sustainability when compared with what conventional for-profit firms do?

Social economy organizations are neither capitalist nor state organizations and are gathered into what is often called the third sector (Defourny & Nyssens, 2017). Gui (1991) explains that two conditions should be fulfilled for being considered as social economy organizations: the right to residual benefits should not belong to the shareholders and the right to residual control should not belong to the public state. There is no unanimous definition of the social economy organizations but most of them focus on both their legal form (associations, cooperatives, mutual, and public-benefit foundations in most countries, and sometimes some specific private companies) and their common values or principles (including participative democracy in decision-making, autonomous management, and the priority given to service to the members or to the community rather than for profit) (Defourny, Gronbjerg, Meijs, Nyssens, & Yamauchi, 2016). In terms of contribution to the social and environmental transition, social economy has largely innovated by setting up initiatives in fields, such as employability, personal care, or territorial development.

For almost 200 years, cooperatives have played a major role in providing services to people excluded from some conventional markets, thanks to the establishment of mutual and solidarity mechanisms. Are they good candidates to favor PSS in a transition perspective? That is the question.

## **2 Literature review on PSS and social economy cooperatives**

We carried out a systematic literature review on Scopus to find all the articles analyzing PSS and cooperative. The search reveals 70 documents (as of June 19, 2023) linking the terms cooperative and PSS, but in many cases, the term cooperative did not refer to cooperatives as organizations. Therefore, after reading the 70 abstracts, only 12 documents appear to be of interest to our research question, and after reading the texts, only two articles really shed light on it, illustrating how little literature has been devoted to this issue so far.

First, Pereira, Carballo-Penela, González-López, and Vence (2016) examine the impact of PSS deployed by agricultural cooperatives on farming eco-efficiency. They argue that agricultural cooperatives already incorporate various features of PSS. Indeed, agricultural cooperatives offer both products (such as material inputs) and services (such as marketing services, technical advice, maintenance), and members of cooperative are particularly looking for the access to the function of the products and services that they collectively own. The collective use of heavy equipment, as for instance, combine harvesters constitutes a good example of this. The authors show in their empirical study that there is an improvement of farming efficiency when PSS is deployed by agricultural cooperatives. They conclude that “economic benefits can be aligned with environmental gains in farms that integrate into service cooperatives” (p.91).

Second, Gelbmann and Hammerl (2015) examined the contribution of re-use eco-work integration social enterprises to the three dimensions of sustainability. They argue that these should have competitive advantages in favoring sustainability compared with conventional firms such as their long tradition in re-use activities, their credibility in balancing the three dimensions of sustainability, and their social mission that may encourage potential customers to buy in such enterprises. They indeed show that re-use eco-working integration social enterprises contribute to the three dimensions of sustainability but when re-use activities evolve from a niche to a dominant practice, the contribution of those organizations is not sufficient anymore since the demand for re-used goods has already overcome its supply. In this vein, it can be useful for such organizations to collaborate with conventional waste management companies.

In conclusion to this literature review and with due respect to the authors mentioned hereabove, we can say that there is a true gap in the literature as for understanding what role social economy cooperatives could play in the implementation of PSS in a true transition perspective.

### **3 Theoretical frameworks**

#### ***3.1 To examine our research question, we suggest to mobilize two theoretical frameworks***

Firstly, we will look at the multi-level perspective, a transition approach. Transition approaches help us understand some of the complexity of the changes required for a transition. More specifically, the Multi-Level Perspective (MLP) is an approach that theorizes the transition of our production regimes, in particular toward more sustainable configurations. It highlights the fact that this transition takes place within a so-called socio-technical system (Geels, 2011), where different technical and social elements are constantly interacting (Maréchal, 2012).

The advantage of this approach of transition lies in its ability to explain how innovations – whether environmental or not – emerge and how they can replace, transform, or reconfigure existing systems (Geels, 2011). MLP sees transitions as non-linear processes resulting from the interaction of developments at three analytical levels (Geels, 2011): niches – the locus of radical innovations – the socio-technical regime – the locus of established practices and associated rules stabilizing existing systems – and the socio-technical landscape – the context that influences niche and regime dynamics (Rip & Kemp, 1998 in Geels, 2011).

Examining PSS under this theoretical framework, we can argue that the firms of the regime have developed the linear economy, which has numerous environmental and social impacts. Linear economy is strongly associated with the globalization and hypercompetition (Delbecq & Fayol, 2018) that characterize our societies and constitute the key elements of our socio-technical landscape. This very same socio-technical landscape, when it evolves, is also the context for the emergence of niches, innovations that rethink problems at their roots, often in opposition to regime practices (Geels, 2011). PSS are potentially good examples of that. In response to a landscape altered by the rise of ecological considerations, companies try to address environmental impacts with radical innovations known as PSS.

Secondly, we use the framework of the five conditions for a strong sustainable potential of PSS developed by Roman et al. (2023). It includes (1) accessibility enhanced by products adapted to unowned uses, associated services contributing to a more sober and informed use of the product and convenient and simple logistics, (2) substitution, PSS must replace more resource-intensive supply systems (Kjaer et al., 2019; Matschewsky, 2019), (3) systemic dematerialization by increasing the immaterial content of the offer and minimizing rebound effects (Behrendt et al., 2017) linked in particular to logistics, (4) territorial anchoring that reinforces the relevance of the offer within a cooperative network (Roman et al., 2020; Ademe et al., 2017), and (5) contribution to sobriety by integrating this dimension right from the design stage (Sandberg, 2021; Niessen & Bocken, 2021).

### **4 Potential contribution of social economy cooperatives to PSS**

Based on the MLP presented hereabove, we can argue that social economy cooperatives should contribute to the development of PSS in a sustainable way. Indeed, while PSS still belong to niches, social economy cooperatives have been part of the socio-technical regime for long time and have both more experience and more clearly defined bylaws. Indeed, as mentioned by Schwabe (2020, p. 108), “citizen-projects such as cooperatives are important incubators for opening up and reinforcing more sustainable development paths” (Schwabe, 2020). Therefore, using more solid anchors like social economy cooperatives could enable PSS to deploy themselves.

We then examine whether PSS deployed by social economy cooperatives may better satisfy the different conditions developed by Roman et al. (2023) for a higher sustainability.

First, in our societies, some people have no access to some basic goods and suffer from material deprivation. By favoring the common use of assets, PSS could become an option for making those goods available to these people. Since social economy has often been considered legitimate to provide goods and services that fulfill customers' needs neither met by government nor by conventional firms, PSS offered by social economy cooperatives may be more inclined than PSS offered by conventional firms to satisfy the accessibility condition.

Second, regarding the condition of substitution, our opinion is less clear-cut since we are not convinced that a social economy cooperative deploying a PSS offer will necessarily develop better solutions that are more likely to substitute classical offers than PSS-based solutions developed by conventional firms.

Third, since socialization is often a major motivation of people participating in social economy cooperatives, such organizations have a high potential for offering immaterial content when deploying PSS. One of the authors of this chapter (Muylaert, 2023) conducted focus groups on six PSS offers (two in clothing, two in mobility, and two in tools). Only one of the offers stood out, attracting only positive perceptions (whereas for the other offers, there were always consumers who were not attracted). Its attractiveness stemmed from the fact that this PSS offer gave the impression of being a human project that brings together people with a common hobby or passion. This finding is clearly anecdotal, but it shows that in addition to its function of selling the use of objects, PSS should be above all places for socializing in order to attract and satisfy consumers. Since in cooperatives, consumers are also often members, they may be more involved in the development of the organization activities. Therefore, it can be easier to identify their true needs and the possibility to deploy a PSS offer that would satisfy them. As a result, by being provided by a cooperative structure, the social impact of PSS could be higher. Furthermore, reducing clients' adoption barriers through a better identification of their needs may favor the economic prosperity of PSS and their potential to have a bigger environmental impact.

Fourth, in terms of territorial anchoring, social economy cooperatives are often built on a group of people who perceive themselves as belonging to the same community. As PSS are often based on the idea of sharing resources between people living in the same geographical area, being articulated with organizations that are themselves often geographically well-rooted can clearly be an advantage, particularly in the cases where dilemmas and conflicts among PSS participants could arise. Indeed, when people belong to the same communities, they tend to share the same values and cultural characteristics, making understanding and compromises probably easier to reach than when remoted individuals must be connected.

Fifth, in terms of contribution to sobriety, social economy cooperatives may also have an important role to play. Indeed, literature shows that when the ownership of an asset is not properly defined, this asset may be overused or undermaintained by users of this asset. This phenomenon is usually referred to as the "tragedy of the commons" (Hardin, 1968). It can generate adverse impacts at the three levels of sustainable development. The way electric scooters are left abandoned in many major cities is a good example of that trend. Traditionally, two solutions existed in the literature: either privatizing the asset, so that the owner looks carefully after it, or putting it under the supervision of a centralized force, typically public authorities. However, Ostrom showed that a third way exists through communities managing properly assets they care for based on precise rules. Based on Ostrom's theory of institutions for collective action, the concept of commoning can probably be useful to understand how efficient PSS could be put in place by cooperatives. De Angelis (2017, p.30) claims that commoning is the creation of "use value for a plurality" that

becomes a community, “claiming and sustaining the ownership of the common good” by building “relational values”. As explained by Albareda and Sison (2020, p.731), “this promotes collective forms of common resource governance and ownership in the pursuit of the common good, including collective entrepreneurial experiments, cooperatives, community-based enterprises and peer production initiatives”. Therefore, in theory, cooperatives that are constituted of members who have different things in common could be better suited than conventional firms to maximize the use and maintenance of shared products. Furthermore, numerous social economy cooperatives are active in fields like repair cafés or second-hand shops where PSS are often advocated for.

After reviewing the five conditions suggested by Roman et al. (2023), it seems to us that for four elements out of five, there are good grounds to suggest that social economy cooperatives could play a positive role in developing PSS in a sustainable way.

## **5 Conclusion**

Our mode of development linked to a linear economy is questioned every day more. In this context, PSS, a branch of the circular economy, appear as particularly relevant since they are claimed to contribute to environmental challenges while providing services to customers. However, the literature on PSS is far from unanimous about the real environmental impact of PSS. Furthermore, although today a real transition to sustainability should include environmental, economic, and social dimensions, the potential social impact of PSS is poorly documented.

Knowing that PSS are often used by traditional enterprises for which profitability often remains the company’s main objective at the expense of the other two dimensions, our study examines whether PSS supplied by social economy cooperatives could better contribute to a TBL sustainability when compared with what conventional for-profit firms do.

When studying the results of conventional firms, it is usual to discuss its effectiveness and its efficiency. Some authors (Robbins, DeCenzo, Coulter, & Né, 2017) also suggest looking at the “effisens”. For an organization, the effectiveness is the fact to reach its objective. Its efficiency is linked to its ability to reach its objective while minimizing the resources used. As for “effisens”, a rarer concept, it aims at identifying if the objective and the way an organization operates makes sense for its members and society.

In the context of this research, PSS organized by social economy cooperatives could be considered effective if the services they provide to customers generate a utility to them comparable to the ownership of the product used. Efficiency as always will be linked to the minimization of the resources used. In some cases, social economy cooperatives could be able to do it even though this is probably the least established argument. As for effisens, as shown in our analysis, it is clear that social economy cooperatives have a very promising profile in order to provide PSS in a TBL perspective. Will it be really the case? This remains to be seen.

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