



Organizing for transformative innovation policies: The role of social enterprises. Theoretical insights and evidence from Italy

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ABSTRACT

Transformative innovation policies can provide systemic solutions to socio-environmental challenges because of their “experimental”, “reflexive” and “inclusive” character. We contend that social enterprises can act as catalysts for transformative innovation for the geographically and socially marginalized. Thus, including social enterprises in transformative innovation policies can mitigate the negative effects of innovation-based growth, making policies more socially and geographically inclusive. Following a syncretic approach to the literatures on transformative innovation policies and social entrepreneurship, this paper identifies the key dimensions of social enterprises’ transformative innovation potential: *directionality* (i.e., social goals as the purpose of innovation); *social and geographical inclusiveness* (i.e., the inclusion of marginalized areas and individuals in the provision of goods or services); *reflexivity* (in terms of participatory governance and monitoring the achievement of goals); and *experimental character* (in terms of establishing partnerships with heterogeneous actors). We then assess this capacity through an exploratory cluster analysis of Italian social enterprises. We identify three distinct groups that suggest a range of entrepreneurial approaches from largely transformative to not at all. The transformative innovation readiness of social enterprises has implications for policymakers seeking to undertake pilot schemes and implement actions that support an appropriately transformative innovation ecosystem.

1. Introduction

Innovation plays an important role in national economies, accounting for almost 50 % of total GDP growth (OECD, 2015). However, innovation policies often entrench geographic and social inequalities, largely as a result of concentrating knowledge-based economy activities in specific regions (Enflo and Rosés, 2015; Rodríguez-Posé, 2018).¹ Thus, metropolitan regions become “insular vanguards” (Unger, 2019) of innovation while rural areas stagnate.

In response, policymakers have proposed location-sensitive solutions: namely, place-based innovation policies that exploit knowledge and technological opportunities for local development (Barca et al., 2012; Rodríguez-Posé, 2018). Yet, this approach has generally failed in

practice, sparking a retreat to place-neutrality and high standardization (Rodríguez-Posé and Wilkie, 2017). So far, place-based policies have mimicked the “Silicon Valley” model, in which knowledge - and technology-intensive organizations focus on innovation processes without considering the needs of, and potential benefits for, specific environments (Breznitz, 2021).

Against that background, this paper investigates how innovation policies can be more socially and geographically inclusive, and thereby respond to societal and environmental needs and challenges.

We focus on the systemic perspective offered by transformative innovation policy (TIP hereafter) (Steward, 2012; Sen, 2014).² TIP represents a new paradigm for innovation policymaking that seeks to address societal and environmental challenges also those presented in

Abbreviations: SE, Social enterprise; TIP, Transformative innovation policies.

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¹ More specifically, knowledge-based economies are defined by the OECD (1996: 7) as “economies which are directly based on the production, distribution and use of knowledge and information”.

² The transformative innovation concept has also been developed by leading scholars in the context of sustainability transitions, socio-technical systems and challenge-oriented innovation systems (see also: Fagerberg, 2018; Diercks et al., 2019; Mazzucato et al., 2020; Mazzucato, 2021).

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the United Nations Sustainable Development Goals (Schot and Steinmüller, 2018; Diercks et al., 2019; Haddad et al., 2022). The transformative perspective conceptualizes innovation from a holistic, boundary-spanning perspective that addresses not only technological issues, but also behavioral and social ones (Borrás and Edquist, 2019). TIP contends that, to confront grand challenges, innovators must directly engage with society and its multiple stakeholders, which entails experimenting with new pathways that include non-traditional institutional actors (Schot and Steinmüller, 2018; Marshall and Dolley, 2019; Howoldt and Borrás, 2022). Moreover, transformative innovation initiatives are locally embedded in specific contexts, but they affect global challenges through their translocal nature (Loorbach et al., 2020). Specifically, transformative innovation is “connected to other local initiatives” and “forms networks that exchange, translate and diffused ideas”, gradually producing the “shared discourse, objects, and practices” that underlie solutions to societal challenges (Loorbach et al., 2020: 252).

The TIP paradigm incorporates new concepts and practices related to the social impact of technology and innovation (Schot and Steinmüller, 2018, 2019; Diercks et al., 2019). These include social innovation (Phillips et al., 2015; Nicholls et al., 2015), defined as “the development of product, process, organizational or marketing innovations that improve the access of vulnerable groups in our society to basic provisions” (Andries et al., 2019: 281), as well as inclusive innovation (Guth, 2005; George et al., 2012; Chataway et al., 2014; Heeks et al., 2014; Pansera and Owen, 2018), defined as “the development and implementation of new ideas which aspire to create opportunities that enhance social and economic wellbeing for disenfranchised members of society” (George et al., 2012: 663). TIP also relates to the concept of social entrepreneurship (Dees, 1998; Austin et al., 2006; Dees and Anderson, 2006; Chell, 2007), which refers to “organizations that created models for efficiently catering to basic human needs that existing markets and institutions have failed to satisfy” (Seelos and Mair, 2005: 241).

The social innovation literature has received limited attention from management and entrepreneurship scholars; hence, the connection between innovation studies and social innovation is still ambiguous (Van der Have and Rubalcaba, 2016). The few studies that make this link highlight that such innovation requires collaborations between different actors in order to identify the trajectories and diffusion of innovations (Edler and Fagerberg, 2017; Howoldt and Borrás, 2022). Here we argue that the social economy, and particularly social enterprises (SEs), can act as a catalyst for transformative innovation for the geographically and socially marginalized.³ That is, including SEs in TIP can mitigate the negative effects of innovation-based growth, making transformative innovation policies more socially and geographically inclusive. We contribute to this nascent literature by formalizing a framework that matches specific elements of transformative innovation to the organizational attributes of SEs (hereafter, the TIP-SEs linkage). We first review the TIP and SE literatures through a syncretic approach, identifying key dimensions that capture SEs' transformative innovation potential: *directionality* (i.e., social goals as the purpose of innovation); *social and geographical inclusiveness* (i.e., the inclusion of marginalized areas and individuals in the provision of goods or services); *reflexivity* (in terms of participatory governance and goal achievement monitoring); and *experimental character* (in terms of establishing partnerships with heterogeneous actors). We then assess this capacity through an explorative cluster analysis of Italian SEs.

³ There are 2.8 million SEs in Europe (representing 10 % of all businesses in the EU) and more than 11 million people who work for social enterprises (about 6 % of all employees in the EU). They operate in several sectors, from health and education to banking and utilities. SEs are mostly micro-, small-, and medium-sized enterprises, but a few are large enterprises with international outreach (European Commission, January 20, 2022).

Our results reveal three distinct groups of Italian SEs that reflect a variety of entrepreneurial approaches (from largely transformative to not at all). We also find that SEs' ongoing technological transformation (Arena et al., 2018; Del Giudice et al., 2019) can accelerate and scale the potential for more transformation-oriented SEs. These actors may deliver services that not only respond to the needs of communities, but also have the potential to adopt technological knowledge.

In short, our paper makes two contributions: First, we add to the debate about how transformative innovation can address societal challenges. Second, we present new empirical evidence on Italian SEs—based on data collected through a wide-ranging survey conducted in 2018—that highlights the organizational characteristics underlying SEs' transformative innovative potential.

2. Transformative innovation and its dimensions

The aim of TIP is to orient the innovation ecosystem toward resolving—or at least alleviating—societal challenges within the framework of UN Agenda 2030 (Mazzucato, 2018; Wesseling and Edquist, 2018; Hekkert et al., 2020; Haddad et al., 2022; TIP, 2022).

As noted by Schot and Steinmüller (2018), TIP establishes a clear paradigm shift relative to previous frames driving innovation policies. The authors distinguished three frames according to three different periods: The first wave of innovation policies, starting in the 1950s, aimed at orienting government programs around addressing market failures in R&D. In the 1980s, the second wave reoriented innovation policies around incentivizing the last mile of innovation (i.e., innovations' commercialization pathways). In the third and most recent wave, policymakers emphasized technological innovation for its economic potential, typically reflected in the numbers of patents or new jobs created (see also Mazzucato, 2018).

Departing from that exclusive focus on economic growth, TIP reframes innovation as a chance to generate sustainable outcomes, respond to societal needs and problems while generating sustainable growth (Boon and Edler, 2018; Edler and Boon, 2018; Diercks et al., 2019; Hekkert et al., 2020). Thus, TIP seeks to address a broad spectrum of challenges, including ending deprivations, promoting social inclusion, improving education, achieving sustainable economic growth and consumption, preserving resources, etc. (TIP, 2022). An example of this normative turn in innovation policy is the Dutch government's Public-Private-Procurement policy (as analyzed by Wesseling and Edquist, 2018). One element of this policy was the “Dutch programme water safety” which sought to develop the employment of a water safety technology (an innovative flood barrier) and thereby address the pressing risks of flooding exacerbated by climate change. This policy reflects an open collaboration between multiple actors (governmental agencies, firms, users, research institutions, and other stakeholders) who mobilize various resources and forms of expertise to implement, develop, and assess the innovative flood barrier (Wesseling and Edquist, 2018).

TIP broadens the understanding of innovation to encompass its social, commercial and public facets. Given this foundation, one can identify several key elements of TIP. The first is directionality: uncovering innovations that drive prosperity⁴ while also addressing social and environmental challenges (Diercks et al., 2019; Grillitsch et al., 2019; Bergek and Haddad, 2022; Haddad et al., 2022). The second is reflexivity capacity: TIP seeks to mobilize diverse resources that spark collaboration and engage with the needs of demand-side actors (Diercks et al., 2019). On this point, Schot and Steinmüller (2018), applying Weber's and Rohracher's framework, acknowledged that TIP should be

⁴ In the traditional innovation-growth perspective, the focus is on the capacity of innovation to increase firms' productivity and profitability, thereby ensuring economic growth in terms of GDP per capita (see, among others, Romer, 1986, 1990; Fagerberg et al., 1999).

able to address a series of innovation policy failures related to: (i) goal setting (or directionality), by requiring multi-stakeholder dialogue and prioritizing to set transformative goals; (ii) coordination among policies from different sectors (as occurred in the Dutch Programme example, which synchronized energy policies and agricultural policies through a collaboration); (iii) meeting the demand, and (iv) involving and monitoring all actors (i.e., reflexivity capacity) by overcoming the inertia of organizations and individuals with respect to change (e.g., the reticence to adopt a new behaviour or an adaptive approach).

Diercks et al. (2019) added another element to this discussion: TIP's policy antecedents (i.e., previous policy paradigm). As the authors pointed out, the TIP paradigm emerged from different literature traditions that point toward both narrow and broad conceptions of transformative innovation. The narrow conception stems from the mission-oriented policy narrative, which imagines innovation as a linear model rooted in supply-side concerns, i.e., innovations generally start in one domain, academia, and move outward focusing on the last mile of innovation process, its commercialization (Diercks et al., 2019). In this approach, innovation policies oriented around grand challenges are scarcely inclusive of actors in civil society (Howoldt and Borrás, 2022). Meanwhile, the broad conception of TIP flows from the socio-technical transitions literature, which highlights the failures of market approaches and instead embraces demand-side needs while being more inclusive of civil society, NGOs, and public agencies (Diercks et al., 2019).

Haddad et al.'s (2022) remedy for the conceptual muddle was to map the five main TIP characteristics that emerged from these fundamental streams. The first characteristic is: (i) *Grand challenges and inclusive growth* as a new general framework for policymaking in innovation; (ii) *Directionality* (clear direction) toward challenges, whereby inclusive growth is the main engine of change and it leverages both top-down and bottom-up policies; (iii) *Multi-faceted policy intervention* in terms of mixing horizontal (sector-neutral) and vertical interventions; (iv) *Multiple actors and a global network* that benefits from a diverse set of stakeholders; and (v) *Multi-level governance* that has reflexive capacities and embraces the experimental nature of TIP. The *experimental nature* concerns partnerships, and specifically how to mitigate failures in the learning and development process that emerge from the challenge of aggregating different actors' conflicting goals and interests. *Reflexivity* is intended as the "ability of the system to monitor, anticipate and involve actors in processes of self-governance towards its transformative goals" (Weber and Rohrer, 2012: 9; see also Schot and Steinmüller, 2018).

While this classification is useful, Haddad et al. (2022) did not clearly define *inclusivity*. In this study, we contend that the inclusivity of transformative innovation features a societal and geographical dimension. In its simplest conception, *Social inclusivity* captures the need for innovations to be accepted by users, communities, and society in general. In other words, it involves identifying and implementing acceptable innovation pathways (Schot and Steinmüller, 2018). Accordingly, it requires broad participation from diverse individuals who may be affected by the innovation. This concept overlaps with inclusive innovation (Chataway et al., 2014), which seeks to include marginalized groups or individuals in the ideation, development, and utilization of an innovation (see also George et al., 2012; Heeks et al., 2014; Tello-Rozas, 2016). *Geographic inclusivity* refers to the capacity of innovation to benefit marginalized geographical areas. Granted, policymakers cannot simply replicate past perspectives, whose efforts to "re-vitalise areas by making investments in new technology-based firms" led to ambiguous results (Schot and Steinmüller, 2018: 1556). In this updated sense, 'benefitting marginalized areas' reflects the ability to use local resources to respond to societal problems—the trans-local aspect of transformative innovations (Loorbach et al., 2020). For example, the Dutch program was implemented by local actors in the Netherlands, but contributes to solving the global climate emergency.

In sum, TIP is a new frame that broadens the impact dimension of innovation beyond economic goals to encompass social and environmental ones. To this end, TIP introduces a series of characteristics that

invert previous narratives. To borrow Haddad et al.'s (2022) phrasing, TIP marks the shift from an economic to a societal policy agenda. Given that SEs jointly pursue economic and social goals, making entrepreneurial contributions to current social challenges (Alter, 2007), we sought to explore their synergies with TIP. In the next section, we develop this intuition.

3. The TIP-SEs linkage

SEs are "organizations that created models for efficiently catering to basic human needs that existing markets and institutions have failed to satisfy" (Seelos and Mair, 2005: 241). To clarify, SEs occupy the middle of a spectrum (Alter, 2007) between two extremes: traditional non-profits (such as philanthropic organizations pursuing social objectives) and traditional for-profits (seeking profit as their primary goal) (see also Dohrmann et al., 2015).⁵ Thus, SEs are defined as hybrid organizations due to the coexistence of social and economic logics in their activity (see, among others, Doherty et al., 2014).

This paper's objectives align with a limited number of works that have highlighted the transformative potential of SEs. Pel et al. (2020) initially conceptualized SEs' transformative innovation capacity as their engagement in collective processes and network-building capacity. Monroe-White and Zook (2018) investigated the link between SEs' innovation and their country-level and macro-institutional factors, finding that SEs' innovation (in terms of product or process) is positively related to public spending on education and health, institutional effectiveness, corruption regulation, etc. The authors also noted that Research and Development (R&D) and Science, Technology, Engineering and Mathematics (STEM) workforces are not predictors of SEs' innovation, suggesting that innovative responses to social problems need to look beyond traditional innovation frameworks. In this vein, Chell et al. (2010: 489) discovered that innovations pursued by SEs require unconventional resources and practices to "offer innovative solutions to persistent social problems". Their findings suggest that SEs' innovation is related to elements beyond R&D funding, such as workforce diversity or embeddedness in social networks. This is consistent with Desmarchelier et al. (2021), who uncovered that public-sector social innovation exhibits a systemic and collaborative nature. By leveraging Zahra et al.'s (2009) social entrepreneur categories, those authors also investigated the different entrepreneurial approaches used to address social problems, ranging from broad and powerful to narrow and weak.

We add to this literature by reflecting on the meaning of transformative innovation within the SE domain. We also develop the TIP-SEs linkage by building a symmetry between key dimensions of TIP and SE organizational characteristics that have emerged from the literature. First, we clarify that the meaning of *transformative* can be different for TIP and SEs. To grasp the TIP-SEs linkage, one needs to look at the historical path of the Social Economy.⁶ The differentiated evolutionary patterns of the Social Economy mirror the variable normative

⁵ There are multiple definitions of SEs, but they reflect three main approaches (Young and Lecy, 2014): European, Anglo-American, and social innovation. In the first view, the concept of SEs is related to the third-sector organizations that pursue public benefit and social missions according to a universalistic and impartial view of social welfare and a multi-stakeholder governance, while also seeking financial sustainability (Defourny and Nyssens, 2017; Sacchetti and Borzaga, 2020). In the Anglo-American view, SEs encompass a broad spectrum of dual-purpose organizations: from for-profit enterprises to pure philanthropic organizations (Dees, 1998). The social innovation view includes a variety of (social) ventures aimed at responding to unmet social needs without clear boundaries (Young and Lecy, 2014). For a broad discussion of the definition of SEs, see also Defourny and Nyssens (2010a,b), Bacq and Janssen (2011), and Alegre et al. (2017).

⁶ We thank an anonymous referee for suggesting a reflection on the meaning of "transformative" in SEs.

approaches adopted.⁷

The first type of SEs are those with a redistributive function (Defourny and Nyssens, 2010a,b). They provide quasi-public goods and services (e.g., education, healthcare, health, etc.) to disadvantaged people, generally free (or almost free) of charge thanks to voluntary in-kind (mainly work or money) contributions (Defourny, 2001: 2). Here, SEs mainly engage in what Alter (2007) named “non-profit with commercial activities”. The second type of SE adds a productive purpose to the redistributive function, with two peculiarities: a multi-stakeholder governance and limited profit distribution (Defourny, 2001; OECD, 2016). The third type of SE is similar to type two, with an emphasis on (and wide recognition of) innovation and its transformative role. Here, SEs are “innovative providers of general interest services that can contribute to both transforming the welfare system and supporting a sustainable development paradigm” (Borzaga and Galera, 2016: 16). Accordingly, SEs are focused on developing innovative solutions that relate to not only the production of quasi-public goods and services, but to a wider spectrum of activities with intentional societal impact (from social agriculture to sports activities, from urban construction to public building regeneration, etc.). These three visions have given rise to coexisting organizational forms that mirror the respective dynamics (Borzaga and Galera, 2016).

In this paper, we stress that such diversity leaves space to discuss what “transformative” means for TIP. While the redistributive role may be dominant in the non-profit SEs, the productive and innovation orientations prevail in the other types. In fact, the second and third typologies have organizational characteristics that mirror some of the main characteristics of transformative innovation identified by the TIP literature (see Section 2).

Aside from being oriented toward social goals, SEs' organizational characteristics reflect TIP's reflexivity, experimental nature and inclusivity. First, SEs have broader goals in terms of societal needs and challenges; thus, they often need to balance the different claims and interests of various stakeholders (Ebrahim et al., 2014; Pestoff and Hulgård, 2016). To do that, SEs use multi-stakeholder governance, which relies on multiple actors to identify needs, adapt strategies, and generally encourage co-creation and co-production among different actors (Pestoff and Hulgård, 2016; Bryson et al., 2017). By adopting inclusive and participatory governance, SEs can cultivate social capital (Cantatore and Spencer, 2015), which facilitates knowledge transfer and diffusion from higher education institutions to small- and medium-sized enterprises (Crescenzi et al., 2013), as well as within organizations (Guth, 2005). Meanwhile, SEs monitor and assess their impact through social impact evaluations (Lall, 2017; Rawhouser et al., 2019). These characteristics mirror what the TIP literature labels *reflexivity*, that is, the ability to implement participatory governance and monitor outcomes so as to navigate complexity and achieve transformative change.

Meanwhile, the experimental nature of TIP is embodied in SEs' multi-faceted identities, which allow them to build partnerships among multiple public and private actors in order to unfold systemic change (Choi et al., 2021).

Lastly, SEs typically include marginalized areas and individuals in their goods/services provision—namely by operating in areas and sectors that markets or governments traditionally cannot reach alone (Tapsell and Woods, 2010). In fact, SEs appear to have more innovation potential in rural and marginalized areas than other businesses: SEs appear to be more evenly distributed across regions than purely commercial enterprises (Wu et al., 2017). This capacity allows them to address geographic inclusivity. The literature recognizes a spatially even distribution of SEs across regions when compared to commercial business (Pinch and Sunley, 2015). Amin et al. (2002) highlighted the intrinsic place-based character of SEs and their capacity to link local

resources to new opportunities and networks for people located in less developed regions. SEs' capacity to tackle societal problems stems from their ability to mobilize local resources in disadvantaged and peripheral contexts (Steiner and Teasdale, 2019). Because of this, Hadjimichalis and Hudson (2007) and Rinkinen et al. (2016) argued that SEs should be included in regional economic-development strategies. This mirrors the *Inclusive* property of TIP.⁸

Based on these links, we contend that SEs have transformative innovation potential that can redistribute economic and social achievements; in short, they may act as a catalyst for TIP. Indeed, SEs stimulate transformative innovation demand by attracting cause-conscious entrepreneurs who become disenchanted by traditional for-profit firms and seek a greater social purpose (Besley and Ghatak, 2017). To make our reasoning more concrete, let's consider Atelier Paysan: a French Social Cooperative seeking to offer technical and technological “sovereignty” to small farmers working in marginalized areas of the country. They offer physical devices running on an open-source platform that give farmers and local entrepreneurs access to technologies for their specific needs, which have not been addressed due to large agro-industries dominating technological development. Atelier Paysan aims to make technological knowledge more open and democratic through courses and consulting services about ‘appropriate technologies’ (Franco et al., 2020), self-designed tools, and the resale of materials that facilitate a more sustainable and place-based agriculture. On the innovation policy side, French institutions are facing problems related to coordinating the characteristics (i.e., being open and experimental; having a bottom-up identity) of the transformative innovation paradigm (Casula, 2022). An example of the potential of the TIP-SEs linkage in this context could be an innovation policy leveraging on Atelier Paysan's success in the field of agroecology to spread innovations in further marginalized areas. In this vein, Atelier Paysan can represent a vehicle (a “catalyst”) for implementing a policy's transformative goals, such as, supporting sustainable growth by preserving small agricultural corporations and supporting their technological advancement.

To clarify our metaphor, a catalyst, in chemistry is “any substance that increases the rate of a reaction without itself being consumed” (Britannica, 2022). Similarly, SEs may increase the policy capacity to find (or at least contribute to finding) innovative solutions that can solve (or at least alleviate) societal problems.⁹ Thus, we argue that most innovation-ready SEs are able to build local networks, foster co-creation and co-production processes between different actors, and operate in remote areas. They represent an entrepreneurial infrastructure for spreading innovation, including technological ones, that can address social needs by inclusively generating transformative change.¹⁰

4. The 7 dimensions of the TIP-SEs linkage

Drawing on the above discussion, SEs' potential can be measured according to key dimensions that mirror the main characteristics of TIP. We identified seven such dimensions of SEs' organizational

⁸ Similarly, Auvinet and Lloret (2015) and Christensen et al. (2006) have argued that SEs can support systemic change due to their organizational characteristics.

⁹ We acknowledge that different entrepreneurial approaches address specific local needs or broad social problems at a large scale. The social economy encompasses SEs with more or less potential to develop transformative innovation, ranging from organizations using current technologies to alleviate unmet needs, to those fostering the co-production of broader innovation, and to those promoting frugal innovation (Zahra et al., 2009). Surie (2017) and Wu et al. (2017) highlighted SEs' potential role as knowledge-intensive actors in innovation if supported by appropriate innovation systems and ecosystems.

¹⁰ The Cambridge dictionary defines “infrastructure” as “the basic systems and services, such as transport and power supplies, that a country or organization uses in order to work effectively”. Here we argue that SEs can be seen as “roads” that allow innovation to reach marginalized peoples and remote areas.

⁷ For a historical reconstruction of the evolution of SEs in Europe, see Borzaga and Galera (2016).

characteristics that provide an exploratory measure of the TIP-SEs linkage. Besides directionality, inclusivity, experimentation, and reflexivity, we add a dimension related to their “technology and innovation propensity”. The technology dimension reflects the extent to which SEs can accept/develop innovation in line with a holistic conceptualization of transformative innovation, which entails mixing social and technological elements (Rahman et al., 2017; Borrás and Edquist, 2019). The strength of the TIP-SEs linkage stems from the degree to which SEs have developed each dimension.¹¹ The description of each dimension is as follows:

1. Technology and innovation propensity captures SEs' readiness to leverage technologies for product and process innovations (see Chell et al., 2010; DiVito and Bohnsack, 2017; Rahman et al., 2017; Monroe-White and Zook, 2018).
2. Directionality describes whether and to what extent social need is driving innovation. Namely, it captures SEs' level of explicit intention to address the needs or problems of a marginalized group. Thus, this dimension reflects whether social enterprises are “directional” in their inherent and intentional orientation to meeting a societal need, consistent with the transformative characterizations outlined by Mazzucato et al. (2020) and Diercks et al. (2019).
3. Social inclusiveness assesses whether marginalized groups are the consumers and/or beneficiaries of innovative products and services; namely, it captures the demand-orientation in innovative activity (Schot and Steinmüller, 2018; Diercks et al., 2019).
4. Geographic inclusiveness captures the diffusion of SEs in peripheral areas: their capacity to operate in rural and/or marginalized areas that are characterized by weak economic structures and concurrent depopulation trends (George et al., 2012; Rodríguez-Posè, 2018). This dimension also encompasses the ability to use local resources to respond to societal problems from a trans-local perspective (Loorbach et al., 2020).
5. Reflexivity I captures SEs' participatory governance setting (i.e., whether marginalized groups are included in innovation processes and decision-making), which is a precondition for transformative innovation given its definition of being inclusive and experimental (Marshall and Dolley, 2019).
6. Reflexivity II is related to SEs' monitoring capacity, i.e., evaluating their social goal achievement (Weber and Rohrer, 2012; Owen et al., 2013; Lubberink et al., 2018).
7. Experimentation, in line with the TIP literature, is related to partnerships and inter-organizational learning. It captures SEs' capacity to build networks and partnerships that promote the development and adoption of transformative innovation in other organizations. This capacity is related to mobilizing cross-institutional and cross-sectorial resources for transformative objectives (Marshall and Dolley, 2019).

5. Methodology and data

5.1. The unit of analysis: the Italian context

This study adopts the European conception of SEs as third-sector ventures: social and co-operative models, anchored to a social mission, that aim to provide a public benefit while simultaneously pursuing

¹¹ The approach of measuring orientation and potential is not new in the managerial literature. For example, DiVito and Bohnsack (2017) adopted a survey to measure “social entrepreneurial orientation”, while Rahman et al. (2017) exploited a survey to create a Technology Readiness Index that measured technology adoption among micro-social entrepreneurs in Bangladesh. Accordingly, we measured these dimensions with survey questions that mirrored different degrees of potential for each dimension. See Appendix 2 for details.

financial sustainability. There are two main reasons that we used Italy as a context to explore the relationship between innovation policies and SEs.

First, Italy's strong mutualistic heritage helped it become a front-runner for social entrepreneurship. The country passed its first law on SEs in 1991 (Law n. 381), thereby producing a benchmark for many other countries (Defourny and Nyssens, 2010a,b, 2017). Since the 90s, social entrepreneurship has grown rapidly to encompass various organizations, including those with stronger market orientation and managerial structuration (Raffini et al., 2021). Indeed, Italian SEs take a variety of legal forms, including social cooperatives and other mutualistic organizations, but also more recent knowledge and technology intensive legal forms. New laws—like Law 221 passed in 2012—have added knowledge- and technology-intense forms to this group, such as impact-oriented innovative start-ups (named SIAVs) (Arenà et al., 2018). Moreover, the “Third-Sector” reform in Italy—introduced by Law 106 in 2016—clarified the type of corporations that can adopt the title of “social enterprise”. Thus, in addition to social cooperatives, there are now organizations pursuing a public purpose, accepting stakeholder participation, and allocating profits to the pursuit of said purpose. Policymakers explicitly enlarged the SE spectrum in order to increase investment opportunities, particularly in relation to innovation and technological development (Raffini et al., 2021).

The second reason relates to recent trends in Italian innovation policy. In recent decades, the Italian policies that incentivize the creation and development of technological districts and science parks have produced limited effects in terms of territorial innovation performance and broader socio-economic impact (Caloffi and Bellandi, 2017; Corrocher et al., 2019). The Italian government also achieved mixed results when it sought to bridge innovation, research, industrial and territorial actors through network practices and collaborative clusters (Caloffi and Bellandi, 2017; Consiglio Nazionale delle Ricerche, 2019). In line with these goals, the Italian Ministry of University and Research defined a “Social Innovation Policy agenda” in 2012. The agenda aims to promote technologically innovative entrepreneurial ideas in the short- to medium-term in order to address specific societal problems in local contexts. Lawmakers supported this action through the so-called Social Innovation Fund, which strengthened public administrations' capacities to implement the initiative. Given the favorable development of SEs in Italy and the government's efforts to generate social impact through innovation policies, the country offered a useful case for exploring the connection between innovation policy and SEs (see also Gerli et al., 2022).

Coherently, our target study population is Italian entrepreneurial organizations that follow the national regulations described above. Using database from the Bureau Van Dijk (AIDA) and the Registers of the Chambers of Commerce, we identified 9305 entities (8101 social cooperatives (87 %), 1087 social enterprises (12), and 117 innovative start-ups (1 %)). These organizations operate mainly in welfare services provision, education, and sport and recreation (ISTAT, 2021).

5.2. Data source

We surveyed our sample of organizations in 2018. The survey comprised eight sections with a total of 48 questions. We identified SEs according to three main variables: legal status, location (north, center or south), and size (number of employees). The questionnaire was sent to companies' publicly available email addresses (most often a standard customer service portal), albeit with a cover letter clearly asking for the survey to be given to founders or managers. The random sample (95 % confidence level with a $-1.25/+1.25$ % margin error) comprised 3682 SEs (about 40 % of the population). The sample consisted of 428 (90 %) social cooperatives, 7 (1.5 %) SIAVs, 38 (8.03 %) ex-lege social enterprise. In term of size: 317 (67 %) are micro, 78 (17 %) are small, only 4 (1 %) medium, and 74 (16 %) are big enterprises. The survey was administered online, using Survey Monkey software, from mid-May to

mid-October 2018. We achieved a response rate of approximately 12 %, equalling 473 collected surveys.¹²

Finally, we derived geographic and sector information for Italian SEs (construct 1 and 7 in our model) from the Bureau Van Dijck (AIDA) database, which is recognized as a comprehensive source of information on Italian enterprises (Lasagni et al., 2015).

5.3. Method

To investigate the transformative innovation propensity of Italian SEs, we first produced descriptive statistics for the variables in the model. We then analyzed the results using cluster analysis, which allowed us to assess if SEs are good candidates for catalyzing transformative innovation policy, as well as group them according to their transformative innovation attributes. Cluster analysis is a multivariate analysis that groups objects with similar attributes (Berry and Linoff, 2004); it is useful for recognizing patterns within distinct objects that form the same dataset (Simón-Moya et al., 2014). Management studies use cluster analysis for a range of purposes, such as grouping firms' strategies or developing taxonomies according to age, size, and growth potential (for a review, see Crum et al., 2020). We did not limit our cluster analysis to a specific algorithm or parameter (Crum et al., 2020); rather, we implemented different specifications from the hierarchical cluster analysis, using Ward's linkage to non-hierarchical k-means with different number of clusters ranging from 2 to 5. We also ran a series of ANOVA tests to capture statistically significant differences among the clusters' variables, if any (Brusco et al., 2017). We then selected the k-means method with three clusters.¹³

5.4. Variables description: operationalizing the 7 dimensions into proxies

In this section, we describe the variables used in our exploratory analysis (see Table A1 in the appendix for details).

5.4.1. Technology and innovation propensity

To measure the technology and innovation propensity of our SEs, we used three proxies: (i) technological intensity; (ii) knowledge intensity; and (iii) technological readiness. To measure (i) and (ii), we adopted the Eurostat classification of a company's level of technological- and

¹² The response rate aligns with other surveys on SEs, e.g., the recent ESEM Survey (the European Social Enterprise Monitor) supported by the European Commission (Dupain et al., 2022). SEs' reluctance to respond to surveys may reflect their reporting culture, which is grounded by an instrumental view. In fact, SEs disclose information mainly "to enhance their performance, access resources, and build organizational legitimacy" (Nicholls, 2009:766, see also Nicholls, 2010; Molecke and Pinkse, 2017). Of course, the relatively low response rate may bias our empirical results, especially if SEs characterized by largely (slightly) transformative characteristics are more likely to complete the survey when they have higher (lower) transformative dimensions. But we had no reason to suspect this occurrence, as the survey asked for organizational characteristics and did not cue respondents to think of their firm as transformative or not. Moreover, following Rogelberg and Stanton (2007), we also monitored the identity of non-respondents in order to avoid biasing the magnitudes and relations among the variables of interest. Specifically, the respondents' characteristics aligned with sample strata in terms of the size and type of legal form.

¹³ In more detail, we first implemented the Ward linkage methodology: an approach that generates groups of observations by analyzing the variance within clusters, instead of measuring the distance among observations (Crum et al., 2020). Ward's method combines observations in the two groups that result in the minimum increase in the error sum of squares. By analyzing the dendrogram, we generated three clusters; however, the ANOVA tests showed non-significant differences between the clusters' variables. We then adopted the k-means approach (with $k = 3$), which creates k groups that minimize the within-cluster variances (squared Euclidean distances). The three clusters were robust under the ANOVA analysis.

knowledge intensity based on its economic sector (sectoral approach).¹⁴ Regarding *technological intensity*, a company is classified from high (4) to non-intensive (0) based on an aggregation of manufacturing industries that combines R&D expenditure/value-added and the two-digit NACE classification of economic activities.

Concerning *knowledge intensity*, the Eurostat classification identifies four categories according to the level of tertiary education achieved by people engaged in specific activities, classified at the two-digit level of NACE sector. The classification ranges from knowledge-intensive and high-tech sectors (3) to non-knowledge-intensive sectors (0). To measure *technological innovation readiness*, we included a survey item capturing whether technological change has (1) or has not (2) modified the organization's response to social needs (cf. Appendix 2, question n. 1). A range of studies (e.g., Lasagni et al., 2015; Daunfeldt et al., 2016) have used this approach to examine innovation, research, and technology.

5.4.2. Directionality (social need as the purpose of innovation)

"Social need as purpose of innovation" captures whether the innovation address the needs, wants, or problems of a marginalized group. To measure it from an organizational perspective, we used revenue source (Appendix 2, question n. 2), which is categorized as: (i) the collection of donations and funds (0), a commercial activity; (ii) unrelated to the social need (1); (iii) an accessory to the social need (2); (iv) partially related to the social need (3); (v) the sale of goods and products in response to the social need (4).

The social entrepreneurship literature has debated the strong link between organizational funding and mission, which is rooted in the consistency between organizations' social and commercial aspects (see Smith et al., 2012; Scillitoe et al., 2018). More specifically, social enterprises occupy a broad spectrum: ranging from charities (relying on donations as funding) to more entrepreneurial actors whose revenues derives from commercial activities that are either related (integrated hybrid) or unrelated (differentiated hybrid) to their intended social cause (see Ebrahim et al., 2014). Tethering the revenue source directly to the social purpose inclines actors to see social challenges as an investment opportunity. In other words, innovations have more potential impact when the organization's revenue is tied to its social purpose.

5.4.3. Social inclusiveness (demand-orientation in the innovative activity)

"Demand-orientation in the innovative activity" captures whether marginalized groups are the consumers of the innovative products and services, and whether beneficiaries are involved in the organization's core activities. To measure this construct, we used two proxies: (i) beneficiaries' degree of involvement in the business and (ii) whether beneficiaries are also the organization's customers (Appendix 2, questions n.3 and n. 4). The variables range from 0 (the first quartile) to 4 (the fourth quartile). The second variable is a dummy assuming the value 1 if the beneficiaries are also consumers, and 0 otherwise.

5.4.4. Geographic inclusiveness

Following the National Strategy for Inner Areas (SNAI, its Italian acronym),¹⁵ we classified municipalities according to a six-class taxonomy that measures their spatial distance from service poles. The classification goes from *urban poles (centres)* (0) (municipalities hosting key services, such as schools, healthcare facilities, and transport facilities) to

¹⁴ Given the low patent propensity of third-sector organizations, we deemed it more appropriate to use a classification based on the sectoral approach (see https://ec.europa.eu/eurostat/cache/metadata/en/htec_esms.htm, last accessed September 2021).

¹⁵ The Italian government launched the SNAI initiative in 2012 to address problems in peripheral and ultra-peripheral areas, characterized by strong demographic abandonment and weakening socio-economic institutions (Masironi and Romagnoli, 2020).

ultrapерipheral municipalities (5) (those located more than 75 min away from service poles). According to the SNAI classification, inner areas are those municipalities classified as intermediary, peripheral, and ultra-peripheral (3–5), while the remaining municipalities are poles where services centres are located (1–2).

5.4.5. Reflexivity I (participatory governance)

“Participatory governance” captures whether marginalized groups are included in SEs’ decision-making. We used three dummies to capture whether (i) beneficiaries, (ii) volunteers, (iii), and employees occupy space on the board, where (1) is inclusion and (0) is otherwise (Appendix 2, question n.5).

Governance is important to addressing both societal challenges and economic sustainability. Moreover, SEs’ co-productive attribute powers its ability to generate public value (Pestoff and Hulgård, 2016; Bryson et al., 2017).

5.4.6. Reflexivity II (monitoring capacity)

Measuring and evaluating social impact is a fundamental aspect of social entrepreneurial research and practice (Rawhouser et al., 2019). To measure “monitoring capacity”, we focused on the type of social-value measurement process implemented by the organization (Appendix 2, question n. 8). The variable assumes a value from 0 to 4 where (0) is ‘does not adopt a measurement process’, (1) is ‘adopts an ad-hoc internal method’, (2) is ‘uses a standard internal method’, (3) is ‘uses an ad-hoc external method’, and (4) is ‘uses a standard external method’. This variable depicts the status quo on current measurement approaches, highlighting that much work is still needed to create accepted and legitimized standards in terms of practices and KPI (Key Performance Indicators) for what concerns social aspects (Molecke and Pinkse, 2017).

5.4.7. Experimentation (partnerships/inter-organizational learning)

We used two measures to capture the capacity to develop inter-organizational learning through partnerships and drive policy change: (i) partnership value (i.e., the degree of importance the organization places on external partnerships and their social value generation process) and (ii) the capacity to affect local policy agendas (Appendix 2, questions n.6 and n.7). The first variable has a value from 0 to 4, where 0 captures the first quartile and 4 captures the fourth quartile of response distributions regarding the value of partnerships in generating social value (see Appendix 2 for details about the question). The second variable is a dummy assuming a value of 1 if the SE is able to affect the political agenda, and 0 otherwise.

6. Results

In this section, we first provide the descriptive results regarding the variables outlined in Section 5.4. Afterward, we present the results of the cluster analysis.

6.1. Descriptive evidence

Table 1 illustrates the technology intensity of our sampled SEs. The majority of SEs (86.47 %) operate in non-technology-intensive sectors,

Table 1
Technology intensity.

Technology intensity	Freq.	Percent	Cum.
0 – Absent	409	86.47	86.47
1 – Low	25	5.29	91.75
2 – Medium-low	11	2.33	94.08
3 – Medium-high	25	5.29	99.37
4 – High	3	0.63	100.00
Total	473	100.00	

with 5.29 % in low-intensity sectors, 7.62 % in medium-intensity sectors, and only 0.63 % in high-intensity sectors.

The data show that 59.83 % of SEs operates in non-knowledge-intensive sectors, while 37.84 % operate in low-knowledge-intensive sectors. Thus, only 3 % of SEs operates in sectors that require knowledge-intensive employment. Our survey data also indicated that nearly half of sampled SEs (48.20 %) declared that technological change has prompted them to adopt innovation in order to better respond to social needs.

Regarding geographic inclusiveness, Table 2 shows that 56.87 % of SEs operates in urban and inter-municipal areas, while 35.31 % operate in outlying and intermediate locations. Some SEs also operate in peripheral (6.34 %) and ultra-peripheral areas (1.48 %).

We then analyzed the characteristics of technology- and knowledge intensity with respect to SEs’ geographic diffusion across “poles” and “inner areas”. We uncovered no substantial difference between SE locations (poles vs. inner areas) in terms of said characteristics (Tables 3 and 4).

Table 5 reveals that, for 83.3 % of the sampled organizations, the primary funding source “directionally” responds to the sale of a product/service that meets a social need. This finding signals that social need represents an entrepreneurial investment per se (i.e., with financial returns) and is not simply a metaphor for the company’s values/practices (see Cohen, 2020: 18).

A high percentage of SEs (89.22 %) indicated that their services benefitted specific disadvantaged societal groups (e.g., people with disabilities, migrants; Table 6). Because beneficiaries represent the demand side of social needs, they were the SEs’ “customers” in almost 67 % of cases.

Table 7 shows the degree of involvement among beneficiaries, volunteers, and employers on the SEs’ boards. Workers were the most involved (81.18 %), followed by volunteers (34.46 %) and beneficiaries (17.55 %).

Table 8 illustrates the SEs’ capacity to internally develop strategies for monitoring their activity and progress toward societal change. We specifically focused on SEs’ systems for measuring their social impact. The majority (63.85 %) of those SEs used a measurement system, while the remaining had none. Within the former group, almost 30 % use shared standards and metrics, while more than 35 % adopted “ad-hoc methods”.

Concerning experimentation, the survey data revealed that SEs have a systemic capacity to build partnerships in order to develop inter-organizational learning and influence political agendas. While 67.65 % of SEs declared that they have successfully established partnerships with other organizations, 11.84 % of these did not think that the partnerships had generated more social value, this means that the 89 % did. In addition, 21.56 % of SEs declared they had influenced the local policy agenda, acting as a catalyst for transformative localized change.

6.2. Cluster analysis

We now exploit a cluster analysis to understand how to group SEs based on all the attributes present in the model. This analysis revealed three broad clusters (Table 9), with 56 (11.84 %), 236 (49.89 %), and 181 (38.370 %) organizations in clusters 1, 2, and 3, respectively.

Table 2
Geographic inclusiveness.

Geographic inclusiveness	Freq.	Percent	Cum.
0 – Urban pole	259	54.76	54.76
1 – Inter-municipal pole	10	2.11	56.87
2 – Outlying area	112	23.68	80.55
3 – Intermediary	55	11.63	92.18
4 – Peripheral	30	6.34	98.52
5 – Ultrapерipheral	7	1.48	100.00
Total	473	100.00	

Table 3
Technology intensity & geographic inclusiveness.

Technology intensity & geographic inclusiveness	Poles (%)	Inner areas (%)
0 – Absent	86.09	88.04
1 – Low	4.99	6.52
2 – Medium-low	2.36	2.17
3 – Medium-high	5.77	3.26
4 – High	0.79	0

Table 4
Technology intensity & geographic inclusiveness.

Knowledge intensity & geographic inclusiveness	% poles	% inner areas
0 – Non knowledge intensive	59.06	63.04
1 – Less knowledge intensive	38.32	35.87
2 – Knowledge intensive	2.62	1.09

Table 5
Revenue source.

Revenue source & social needs	Freq.	Percent	Cum.
0 - the collection of donations and funds	7	1.48	1.48
1 - commercial activities not related to the social need	20	4.23	5.71
2 - commercial activities accessory with respect to the social need	41	8.67	14.38
3 - commercial activities partially related to the social need	11	2.33	16.70
4 - the sale of goods and products responding to the social need	394	83.30	100.00
Total	473	100.00	

Table 6
Marginalized beneficiaries.

Marginalized beneficiaries	Freq.	Percent	Cum.
0 main beneficiaries are not a specific class of marginalized	51	10.78	10.78
1 main beneficiaries are a specific class of marginalized (disabilities, migrants, inmates)	422	89.22	100
Total	473	100	

Table 7
Participatory governance and intra-organizational learning.

Participatory governance	Freq	Percent
Presence of employees on the board	384	81.18
Presence of beneficiaries on the board	83	17.55
Presence of volunteers on the board	163	34.46
Total	473	

Table 8
Monitoring capacity.

Monitoring capacity	Freq.	Percent	Cum.
0 - no measurement process within the organization	171	36.15	36.15
1 - internal measurement with ad-hoc method	129	27.27	63.42
2 - internal measurement with standard method	119	25.16	88.58
3 - external staff measurement with ad-hoc method	44	9.30	97.89
4 - external staff measurement with standard method	10	2.11	100.00
Total	473	100.00	

We describe the three clusters according to the cluster means obtained for the 14 characteristics considered (Table 10). Not all variables across the three clusters demonstrated statistically significant differences; however, there was at least one significant dimension per construct, with the exception of monitoring capacity.

Table 9
Frequency of clusters.

Cluster	Freq.	Percent	Cum.
1 – <i>Not transformative</i>	56	11.84	11.84
2 – <i>Partially transformative</i>	236	49.89	61.73
3 – <i>Largely transformative</i>	181	38.27	100
Total	473	100	

1- *Non- transformative* (n = 79)

We labeled this cluster *non-transformative* because, while its organizations displayed a discrete potential in terms of “technology and innovation propensity”, they had below-average scores in the following constructs: *socially inclusive* (“demand orientation in innovation”), *directionality* (“social need as the purpose of innovation”), *reflexivity I* (“participatory governance and processes”), and *experimentation* (“partnership & inter-organizational learning”).

2- *Partially transformative* (n = 236)

This cluster displayed high potential in terms of directionality, social inclusion and experimentation. However, this cluster comprises SEs that are mainly located within poles (central locations) and thus reflects lower *geographic inclusiveness*. This cluster also represents SEs with weaker *reflexivity* (participatory governance). In short, this cluster comprises SEs with high scores in most of the social dimensions (except for technology intensity, participatory governance, and territorial inclusiveness).

3- *Largely transformative* (n = 181)

This cluster exhibited the highest score for social and geographical inclusiveness, directionality, social inclusivity, reflexivity, and experimentation propensity. It comprises organizations that have concurrently high scores across all the model dimensions, except for technology intensity, which is lower than average (reflexive monitoring capacity was also below-average, but there were no substantial differences among the three clusters regarding this variable). This cluster reflects SEs that have the capacity to directly involve actors in working toward transformative goals (participatory governance), especially with respect to employee involvement and influencing policy.

7. Discussion

This paper contributes to both the TIP and SE literatures by assessing SEs' potential for triggering TIP. Our results indicate that SEs have a lower propensity toward technology and innovation (as measured through traditional constructs) because they operate in sectors that are not traditionally high-tech and innovative. However, SEs are gradually undergoing a technological transformation, with new organizational forms arising to exploit the potential of technological–social innovations (Del Giudice et al., 2019; Turker and Ozmen, 2021). Accordingly, SEs' capacity to inclusively innovate in marginalized areas can be accelerated and potentially “scaled” by growing and furthering the transformation of SEs (Scillitoe et al., 2018) and their technological transformation (Desa and Basu, 2013; Del Giudice et al., 2019; Turker and Ozmen, 2021). In line with this finding, 50 % of the surveyed SEs confirmed that technology has changed how they respond to social needs, suggesting that technological advancement is an ongoing process. However, TIP may galvanize technology-induced transformation.

The results for *geographic inclusiveness* suggest that even technology-intensive SEs can be located in different areas compared to commercial organizations, which have often clustered into metropolitan areas to form “insular vanguards” (Unger, 2019). Our results are consistent with previous studies finding that social entrepreneurs can operate in

Table 10
Cluster means for each variable.^a

Dimensions/constructs	Variables	Min	Max	1	2	3	Total	F(2, 470)	Prob > F
Technology and innovation propensity	Technology intensity	0	4	1.375	0.174	0.088	0.283	78.94***	0
	Knowledge intensity	0	1	0.018	0.021	0.028	0.023	0.13	0.8751
	Technological readiness	0	1	0.482	0.475	0.492	0.482	0.06	0.9419
Social inclusiveness I - Social need as purpose of innovation-	Revenue source from social needs	0	4	1.857	3.898	3.796	3.617	232.69***	0
Social inclusiveness II - Demand-orientation in innovative activity-	Identity beneficiary customers	0	1	0.411	0.703	0.702	0.668	9.82***	0.0001
Reflexivity I -Participatory governance-	Beneficiaries' specific class of marginalized	0	1	0.714	0.890	0.950	0.892	13***	0
	Beneficiaries involvement	0	4	1.982	3.025	2.961	2.877	23.58***	0
	Beneficiaries on the board	0	1	0.125	0.186	0.177	0.175	0.59	0.5548
Reflexivity II -Monitoring capacity-	Employees on the board	0	1	0.679	0.801	0.867	0.812	5.26**	0.0055
	Volunteers on the board	0	1	0.286	0.339	0.370	0.345	0.71	0.4942
	Measurement of social value	0	1	1.071	1.195	1.088	1.140	0.63	0.5342
Experimentation - Partnerships, inter-organizational learning and policy change -	Value attributed to partnerships	0	4	1.536	2.750	2.646	2.567	26.11***	0
	Capacity to affect local policy agendas	0	4	0.089	0.212	0.260	0.216	3.72*	0.0248
Geographic Inclusiveness	Territorial diffusion in peripheral areas	0	5	1.107	0.025	2.685	1.171	727.18***	0

^a While the variable Knowledge intensity has a range from 0 (min) to 4 (max) (see Table A1 in the Appendix 1), neither of the SEs in the sample have value 2, 3, or 4.

marginalized areas (Pinch and Sunley, 2015). That said, given resource scarcity (Tapsell and Woods, 2010) and institutional constraints, innovation capacity is generally linked to self-organization capacity (i.e., the result of an entrepreneurial actor's interactions with locally acquired knowledge).

The survey results indicated that SEs are *socially inclusive* in terms of both their purpose and consumption. Indeed, their entrepreneurial intention is strictly connected with their desire to find solutions to demand-based social needs. The beneficiaries of these solutions are often the SEs' customers, meaning that innovations directly benefit marginalized people. This result is consistent with previous studies in the inclusive innovation literature (Heeks et al., 2014).

Turning to *reflexivity*, SEs' participatory governance is captured by the degree of board involvement among beneficiaries, volunteers, and employees. In the transformative innovation perspective, collaborative processes enable interactions and support learning processes within the institution (Schot and Steinmüller, 2016; Diercks et al., 2019). Our study found that workers had widespread involvement, while volunteers were present in more than one third of the respondent SEs (see also Tandon, 2014). A majority of our sampled SEs monitored their social impact using various measurements, suggesting they are accountable in relation to their products and services (Rawhouser et al., 2019).

Lastly, we focused on SEs' *experimental* approach in terms of building external networks. Similar to social innovation networks featuring collaboration between public sector and third sector organizations, and citizens (Desmarchelier et al., 2021), SEs operate in an inclusive context in which interaction occurs through diffused inter-organizational partnerships. This is particularly relevant, as revised models of knowledge and technology transfer based on social entrepreneurial organizations may leverage this embeddedness to benefit regions and communities. Nonetheless, SEs' embeddedness appears weaker when looking at their capacity to systematically orient local policy agendas toward solving societal challenges. While SEs' localized advocacy capacity seems latent, it may be enhanced by appropriate supportive ecosystems (Terstriep et al., 2020).

Aside from the above, the cluster analysis showed heterogeneity among the transformativeness of SEs, offering insights into whether SEs have the potential to engage in TIP. Based on our assessment, cluster 3 (*largely transformative*) is ready to be included in a feasibility study for catalyzing TIP. These firms' geographic inclusiveness, reflexivity, and experimentation capacity are assets that can overcome the instrumentalism and standardization that often characterize innovation policymaking (Rinkinen et al., 2016). Cluster 2 (*partially transformative*) is

socially inclusive, but its concentration in urban areas undermines its potential for a geographically-inclusive transformative policy. Cluster 1 (*not transformative*) includes more technology- and innovation-ready SEs, but is less socially inclusive; thus, researchers may need a screening procedure to capture whether the SEs in this cluster have a catalyzing potential for TIP.

Our findings show that SEs in cluster 3 represent an available organizational "asset" for TIPs. This unexplored potential may be realized by the technological transformation of entrepreneurship, empowering the social entrepreneurial role of socially-oriented technological innovators that require appropriately supportive systems (Del Giudice et al., 2019; Turker and Ozmen, 2021).

8. Conclusions

How SEs can support TIP? In this paper, we investigated SEs' potential to trigger transformative innovation policies (i.e., those that address social challenges or needs). To this end, we developed an exploratory mapping of SEs based on their potential to contribute to TIP.

Our study adds to the current debate on the role of TIP in enabling transformative change and meeting societal challenges (Schot and Steinmüller, 2016; Diercks et al., 2019; Marshall and Dolley, 2019; Haddad et al., 2022)—namely by exploring and formalizing a framework that matches key elements of TIP to SEs' organizational characteristics. We also contribute to the literature that connects innovation to social innovation (Van der Have and Rubalcaba, 2016; Andries et al., 2019; Pel et al., 2020; Desmarchelier et al., 2021). Specifically, by conceptually and empirically linking SEs to TIP, we highlight SEs' role as transformative innovators and identify the upstream organizational characteristics that embody SEs' potential.

Our main policy implication is straightforward. Policymakers interested in TIP should implement pilot initiatives with the most "ready" SEs: those representing the best mix of innovation and social policies. At the same time, policymakers can promote a favorable ecosystem for the TIP-SEs linkage. For example, policymakers could promote impact measurement and partnerships among SEs through specific initiatives (e.g., capacity building and networking activities) that improve SEs' performance (Glänzel and Scheuerle, 2016; Richter, 2019). With particular reference to the Italian context, about 88 % of sampled SEs in Italy were either partially or largely transformative. This situation suggests that SEs represent a flourishing infrastructure for Italian innovation policymaking. As noted in the recent ASVIS report (ASVIS, 2020: 7): "The greatest commitment to sustainable development in the last five

years, the actions taken in response to the pandemic were largely aimed at protecting the socio-economic system, rather than transforming it to put it on a more sustainable path". Thus, policymakers could leverage the TIP-SEs linkage when developing a long-term vision toward addressing the most urgent societal challenges and achieving sustainable growth. On the other hand, the 12 % of "not transformative" SEs may be incentivized to expand their potential transformative SEs building capacity building program for strengthening the measurement and networking capacity as well as increasing the technological readiness through appropriate reskilling and/or by leveraging on social public procurement as tool to incentivize transformations (Hafsa et al., 2022).

In spite of these results and their applications, our paper features a few limitations. The first involves the operationalization of our proposed framework. This paper is among the first to use an exploratory cluster analysis to uncover SEs' different potential for becoming TIP catalysts. However, the literature is a conceptual muddle of abstract terms like 'social value', 'needs', and 'transformation'. Thus, research could advance our proposed operationalization by further exploring the connection between the dimensions and their proxies—perhaps by developing in-depth and comparative case studies (Eisenhardt, 1989; Yin, 2003). By investigating the perspectives of policymakers and entrepreneurs, a case study approach would help to clarify how proxies make sense of these transformative potentials.

Second, we did not explore how other contextual elements (besides SEs' potential) could shape policy effectiveness. Thus, further research should consider context-related variables such as the state or regional innovation policy implemented, the state of the economy, the urgency of certain challenges, etc. It would also be worthwhile to assess whether

our proposed proxies and concepts differ across countries.¹⁶ In short, policymakers may need to adopt a systemic transformative perspective in order to tightly integrate social, welfare, industrial, and innovation policymaking (Marshall and Dolley, 2019). Finally, research needs to more deeply evaluate SEs' knowledge and technological intensity in order to enable a more precise and evidence-based transformative policymaking.

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CRedit authorship contribution statement

Magali Fia: Conceptualization, Co-supervision, Original draft preparation and further adaptations, Methodology, Analysis, Writing-Reviewing and Editing. **Francesco Gerli:** Conceptualization, Original draft preparation, Original draft analysis, Data curation, Integrations in the edited version. **Mario Calderini:** Supervision, Conceptualization, Validation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

Appendix 1. Variables

Table A1

Summary of the variables.

N	Dimension/construct	Variables	Description	Source	Range
1	Technology and innovation propensity	Technology intensity	Categorical variable: measure of technological intensity according to the sector-based (NACE) classification provided by Eurostat	AIDA	Min 0 max 4 0 = no technology intensity 1 = low technology intensity 2 = medium-low technology intensity 3 = medium-high technology intensity 4 = high-technology intensity
		Knowledge intensity	Categorical variable: measure of knowledge intensity according to a sector-based (NACE) classification provided by Eurostat	AIDA	Min 0, max 3 0 = Not knowledge Intensive Sector 1 = Less knowledge Intensive Sector 2 = Knowledge Intensive Sector 3 = Knowledge intensive and High-tech Sector
		Technological readiness	Binary variable: whether technological change has modified the way they respond to social need	Survey Q1	Min 0, max 1. 0 = No technological readiness 1 = Technological readiness
2	Social inclusiveness I - social need as purpose of innovation	Revenue source	Categorical ordinal variable: strength of the relationship between the first revenue source with the response to social needs	Survey Q2	Min 0, max 4 The first revenue source of the organization is 0 = the collection of donations and funds. 1 = commercial activities not related to the social need 2 = commercial activities accessory with respect to the social need 3 = commercial activities partially related to the social need 4 = the sale of goods and products responding to the social need
3	Social inclusiveness II - demand-orientation in innovative activity	Marginalized beneficiaries	Binary variable, indicating that the main beneficiaries of the social value of the organization are represented by specific marginalized groups	Survey Q3a	Min 0, max 1. 0 = Absence of Specific marginalized groups among the beneficiaries of the

(continued on next page)

¹⁶ We thank the anonymous referee for suggesting this point.

Table A1 (continued)

N	Dimension/construct	Variables	Description	Source	Range
					social value 1 = Presence of Specific marginalized groups among the beneficiaries of the social value
		Beneficiaries involvement	Categorical ordinal variable by quartile: 0–100 scale: degree of beneficiaries' involvement in the business.	Survey Q3b	Min 0, max 4. Quartile-based scale. 1 = 0 - Absent 1 = (0;0.25] - Low 2 = (0.25; 0.5] - Medium\low 3 = (0.5;0.75] - Medium\high 4 = (0.75;1] - High
		Identity beneficiary customers	Binary variable, indicating an identity between beneficiaries and customers.	Survey Q 4	Min 0, max 1. 0 = Absence of identity 1 = Presence of identity
4	Reflexivity I -participatory governance	Beneficiaries on the board	Binary variable: presence of organization's beneficiaries on the board.	Survey Q 5	Min 0, max 1. 0 = Absence of beneficiaries 1 = Presence of beneficiaries.
		Volunteers on the board	Binary variable: presence of organization's volunteers on the board.	Survey Q 5	Min 0, max 1. 0 = Absence of volunteers, 1 = Presence of volunteers.
		Employees on the board	Binary variable: presence of organization's employees on the board.	Survey Q 5	Min 0, max 1. 0 = Absence of employees. 1 = Presence of employees.
5	Reflexivity II monitoring capacity	Measurement of social value	Categorical ordinal variable: measurement robustness of social value measurement process in the organization. and rigour	Survey Q 8	Min 0, max 4. 0 = no measurement process within the organization, 1 = internal measurement with ad-hoc method, 2 = internal measurement with standard method, 3 = external staff measurement with ad-hoc method, 4 = external staff measurement with standard method.
6	Experimentation - Partnerships, inter-organizational learning and policy change	Value attributed to Partnerships	Categorical variable, by quartile: perceived value attributed to interorganizational partnerships on 0–100 scale.	Survey Q 6	Min 0; max 4. Quartile-based scale. 1 = 0 - Absent 1 = (0; 0.25] - Low 2 = (0.25; 0.5] - Medium\low 3 = (0.5;0.75] - Medium\high 4 = (0.75;1] - High
		Capacity to affect local policy agendas	Dummy variable: perceived capacity to have successfully affected policy agendas.	Survey Q 7	Min 0, max 1. 0 = No success 1 = Success
7	Geographic inclusiveness	Territorial diffusion in peripheral areas	Categorical ordinal variable of territorial remoteness of SEs location.	AIDA	Min 0, max 5. 0 = Urban pole 1 = Intermunicipal pole 2 = Outlying area 3 = Intermediate location 4 = Peripheral location 5 = Ultraperipheral location.

Appendix 2. Questions included in the survey

In this appendix we provide a summary of survey questions analyzed in this paper.

Question 1)

Has the availability of innovative technologies changed the model used by the organization to solve the social problem?

- a) Yes
- b) No

Question 2)

Please indicate the first revenue source for the organization (select only one response)

- a) the collection of donations and funds
- b) commercial activities not related to the social need
- c) commercial activities related to the social need
- d) commercial activities partially related to the social need
- e) the sale of goods and products responding to the social need

Question 3)

a) Who are your direct beneficiaries of the social value generated

- Elderly
- Unemployed people
- Children and teenagers
- People with a physical or psychological disability
- Offenders or former offenders
- People affected by any kind of addiction
- Refugees and migrants
- Environment

b) To what extent does the organization involve the beneficiaries in the creation of the product/service what meets the social need?

(Scale 0:100)

Question 4)

Do the beneficiaries of the organization correspond to the customers of the product/service

a) Yes

b) No

Question 5)

Which of the following stakeholders are on the board of the organization (more than one answer is allowed)?

a) Beneficiaries

b) Volunteers

c) Employees

Question 6)

Please rate the degree to which you agree with the following sentence (0 min agreement - 100 max agreement): The organization has built partnerships that have created a greater level of social value than working alone.

Question 7)

In the last two years, the organization has significantly and successfully influenced local policies through its action?

a) Yes

b) No

Question 8)

Has the social value, created by the organization, been measured?

a) No measurement process within the organization,

b) Internally with ad-hoc method

c) Internally with standard method

d) With external staff and with an ad-hoc method

e) With external staff and with a standard method.

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