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Cluster policy: the challenging and complex horizon in the 2020s

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ABSTRACT

Cluster policies have been implemented for many years across Europe. Within an evolutionary perspective, industrial development policies need to be updated, and adapted to respond to new changing scenarios, challenges and demands of the social and economic community. It is the case of the challenges raised by climate change and the recent international summits and agreements (e.g. 2016 Paris Agreement or the recent COP27 in Sharm-el-Sheikh) or by exogenous shocks to supply and demand due to present international crises. This is the focus of this paper that analyses the evolution of cluster policies and identifies a specific gap that could and should be addressed soon. The policy literature thoroughly examines several areas that cluster policy should target to respond to the aforementioned challenges. However, one component is not adequately considered. This is the social capital linked to the important migration waves that have modified the social spectrum of European economies and have produced a strong impact on the way industry clusters function. Specific actions are required to address these important transformations and to restore the 'social embeddedness of economic action' and the social capital that ignites the competitive capacity of clusters.

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1. Introduction

With over 1500 clusters across the large European geography (European Cluster Observatory 2022), the importance of these local/regional industry configurations cannot be underplayed (European Commission 2023). However, their competitive role in industry cannot be taken for granted; instead, a proactive development/policy approach is required to maintain and even bolster their effective contribution to competitiveness, economic performance and the overall social wellbeing across the European economies.

Cluster policies have been implemented for many years across Europe, first in informal terms and more recently in more formal terms (Schmitz 1992; Belussi 1999; European Commission 2023). However, the evolutionary economics perspective stresses

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that industrial development policies need to be progressively updated, and adapted to respond to new scenarios, challenges and demands of the overall social and economic community (Flanagan, Uyarra, and Wanzenbock 2023). It is the case of the challenges raised by climate change and the related international summits and agreements (e.g. 2016 Paris Agreement or the recent COP27 in Sharm-el-Sheikh) or exogenous shocks to supply and demand such as with the current international gas crisis, among others. This is the focus of this specific paper that analyses the evolution of cluster policies and identifies a gap that these policies could address over the next few years.

The policy literature thoroughly examines several areas that industry cluster policy could and should target to respond to the afore-mentioned challenges. However, in our view there is one component that it is not adequately considered. This is the social context linked to the important migration waves that have modified the social spectrum of European societies and their economies and have produced a relevant impact on the way traditional industry clusters function and compete in open markets. Specific actions are required to address these important transformations so as to restore the effective 'social embeddedness of economic action' (Granovetter 1985) and the social capital that ignited the competitive capacity of clusters and industrial districts in the past (Becattini 1990; Trigilia 1992; Putnam 1993; Parrilli 2009). This novel challenge requires a totally new type of work within clusters, which is oriented to benefiting from more heterogeneous sources of social capital, i.e. bridging social capital (Putnam 2000; Parrilli 2012; Dei Ottati 2018).

This document includes a historic section (two) on the growing importance of clusters and cluster policies in the 1980s and 1990s, before moving to section three where the most recent policy developments are discussed. In section four the impact on economic performance and economic development are presented, while the current policy gap is identified and discussed in section five together with specific policy actions that could be put in place to address such gap. Section six present some synthetic conclusions.

2. Early approaches to industry clustering and initial policy insights (1980s–1990s)

The early research on the success of industrial districts in Italy (Piore and Sabel 1984; Becattini 1990) and elsewhere (Pyke, Becattini, and Sengenberger 1990) focused on critical conceptualisations on the key drivers and competitive frameworks (e.g. Porter's diamond, 1990; Schmitz's collective efficiency, 1992). On these bases, some preliminary attempts were developed around the formation of cluster and industrial district strategies as a means to transfer useful lessons to other contexts, countries and regions (Porter 1990; Schmitz 1992; Asheim 1994; Belussi 1999).

Several industry clusters were identified as examples of successful experiences in developed and developing countries such as the automotive industry in Baden-Wurttenberg (Cooke and Morgan 1994), the textile, food and motor clusters in Emilia-Romagna (Brusco 1982), the footwear clusters in Sinos Valley (Schmitz 1995), Guadalajara (Rabellotti 1999), and Agra (Knorringa 1999), among many others. On the whole, several scholars realized that SME clusters represent the backbone of many important economies, such as Italy (Sforzi 2002), Spain (Boix and Galletto 2009), China (Bellandi and Di Tommaso 2005), and Brazil (Cassiolato and Lastres 2000), among others.

International organizations and governments followed suit and deployed cluster policies to promote growth in western economies, and even more so in developing countries. This is the case of the leading work of the United Nations Industrial Development Organization (Ceglie and Dini 1999) in relation to the promotion of networks of firm and institutional collaboration in India, Nicaragua, and the Caribbean, among other countries; or the work of the Inter-American Development Bank to support the formation of effective clusters in global value chains across Latin America (Pietrobelli and Rabellotti 2007).

Several governments backed by the powerful network of the Harvard Institute of Strategy and Competitiveness developed strategies around clustering within the boundaries of their own countries. This depended very much on the interest of national policy makers to apply policy instruments to large national geographies rather than local geographies. As Porter's approach to clusters (1990, 2008) is geographically 'flexible' (i.e. sometimes local, others regional or even (sub)national), it created room for a much more flexible policy tool than the more circumscribed 'industrial district' approach (Becattini, Bellandi, and De Propris 2008; Schmitz 1992).

In any case, both institutional channels (national and regional/local) stressed two types of action. On the one hand, they stressed the importance of horizontal networking and cooperation; on the other, the emphasized the significance of vertical, supply chain components. The former indicates the importance to pull together joint actions that restore scale and scope economies across large numbers of small and medium-sized enterprises (SMEs) in activities related to R&D, commercialization, input purchase, access to finance, among others (Schmitz 1992; Ceglie and Dini 1999). The latter is about the reconstitution of collective advantages in the vertical connection of supply chain agents that generate the capacity to efficiently reach out to markets as well as to input supply and service provision (Porter 1990; Humphrey and Schmitz 2002; Pietrobelli and Rabellotti 2007).

With these considerations in mind, several projects were implemented within Europe and around the world from the early 2000s. Among these, the important European Cluster Observatory (ECO) created within the Stockholm Economics School in collaboration with the Harvard Institute of Strategy and Competitiveness. It produces detailed figures around more than 1,500 clusters operative across Europe in relation to their position – i.e. mapping – the type of organizations they contain and other figures that help to identify the overall competitiveness of these geographical and industry concentrations (http://www.clusterobservatory.eu/). This effort has been appropriated by the European Commission that gathered the opportunity to exploit these relevant tools for the assessment of the clusters' competitiveness and the required promotion policies across the European space. This endorsement led all European countries to put in place policies and programs to support innovative measures to strengthen their clusters. The case of Sweden is particularly representative (Dinnetz 2007); here the cluster policy has been framed around three focal points, (i) innovation and technology, developed for instance through the program 'Visanu', oriented to support existing clusters, connecting them with knowledge sources in the innovation system, and marketing them more broadly; (ii) regional economic development, promoted for instance through the Inter-reg program 'District', which supported the role of SMEs in mature industry clusters in Vastra-Gotaland, and (iii) Entrepreneurship in SMEs, applied for instance through the

'Network of Incubators' program across various regions and supported by the agency Vinnova (Dinnetz 2007). The Swedish case shows the important effect of this European effort in the definition of cluster policies across Europe in the 2000s (http://www.clusterobservatory.eu/policy).

3. Strategic policy developments in the 2010s

3.1. Theoretical advances in the 2010s

In the 2010s, a strand of scholarly research developed a new analytical framework called 'related varieties' (Asheim, Boschma, and Cooke 2011; Boschma and Capone 2015). This approach identified the importance of growing through related industries (e.g. biotechnology from pharmaceuticals, logistics from transportation, etc.) as this represents a gradual and firmly grounded growth based on former skills and capabilities that are gradually improved and expanded once different actors and industries/companies come together exchanging knowledge insights, technologies and competences. This strategy opens the opportunity to enter new industries/sectors that are often part of the same broader industry classification (two-digit NACE), thus increasing the resilience and resistance to shocks of regions and industries (Boschma and Iammarino 2009), and promoting their renovated competitiveness through an increasing complexification of their economies (Asheim, Boschma, and Cooke 2011).

Simultaneously, other scholars developed a complementary novel framework for the development of regional economies and their clusters called 'smart specialisation'. Foray (2016) and McCann and Ortega-Argiles (2015) identified the importance of a smart specialization (clustering) strategy (S3) across large geographies (i.e. Europe). This represents 'a virtuous process of diversification through the local concentration of resources and capabilities in a certain number of new domains that represent possible paths for the transformation of productive structures' (Foray 2016, 1430). Such smart specialization represents the capacity of regional economies to promote new 'entrepreneurial discoveries' around new activities that bring about a 'smart' approach that is simultaneously unique, complementary and necessary to the rest of the regions and markets so as to form a competitive space with plenty of hardly overlapping specializations that respond to a larger, changing and challenging demand from the largest pool of consumers (i.e. the European space and beyond).

In this case a number of strategies can be adopted to promote the overall diversification of the economy and its enhanced competitiveness. These strategies include operations for re-tooling or extending (e.g. introducing Key Enabling Technologies -KETs- in traditional industries) to more complex and demanding efforts through emerging industry clusters or even the cross-fertilization of industries (e.g. the growth of an IT industry from a former electronics cluster, or the introduction of biotechnology R&D in the fishery industry, see Navarro, Aranguren, and Magro 2012). These strategies and actions go beyond the horizontal type of policies, while putting in place vertical policies that help to create more specific skills and capabilities in the selected region with an overall focus to form an effective and region-specific 'micro-system of innovation' that is dependent on grassroots-based entrepreneurial discovery processes rather than on a 'mistake-type 1 of the omniscient (government/central) planner' (Foray 2016, 1432).

Overall, these two approaches complement well each other as the former (i.e. related variety) tells what is the best analytical/scientific framework for industry diversification and expansion, while the latter (i.e. smart specialization) focuses on promoting such specializations insofar as the scope for overlapping and duplications is limited or controlled to the extent of avoiding inefficiencies and destructive competition inside the common market area. As we see in the following subsection, this approach has produced an important impact on the renovated competitiveness of the European economies.

3.2. Cluster policies and their impact

3.2.1. Policy frameworks and measures

Framed within the wider Lisbon Agenda on Innovation, this twofold approach (i. related varieties, ii. smart specialization) has become effective through the S3 strategy over the past ten years across Europe. Moving beyond the steps taken in former institutional frameworks, the European Commission has been driving this approach through new frameworks. In 2021, the European expert group on clusters issued a 'Recommendation Report' that identified the critical blueprints for cluster policy in the 2020s; (i) leading the green transition; (ii) accelerating the digital transition, and (iii) building resilience. In the first realm, a relevant example is delivered by the Danish Strategy for Circular Economy or the European Hydrogen Cluster Alliance. These represent benchmarks of what can be done in relation to circular, greener and more competitive SMEs. The second objective (digital transition) is aligned with initiatives led to increase the clusters' capacity to provide advanced business services to SMEs as in the case of the Artificial Intelligence 4.0 strategic program in Finland, or the Transilvania Digital Innovation Hub that is trying to make clusters an integral part of digitalized innovation processes. At a wider level, clusters are seen as strategic agents for the implementation of digital policies in the European space as in the Galatea project across five countries and seven ICT clusters. The third objective, the resilience component, refers to the capacity of policies to help clusters respond to exogenous shocks and crises, e.g. the disruption of value chains following the recent Covid-19 and gas crises in Europe. This approach has taken the form of the European Alliance Against Coronavirus (EAAC) and its outputs such as protective equipment and technologies by machinery manufacturers, or the development of an active role of clusters in local labour markets for the reskilling and upskilling of workforce in times of crisis as with the AS-Fabrik Alliance in Bilbao, among others (EU Commission 2021).

These three objectives, and the related promotion policies and programs, are to be met through stages in which relevant capabilities are built up. These include (i) the formation of 'islands of excellence' in specific innovative industries, (ii) the development of industrial value chains (to connect industry leaders with a large set of SME suppliers), and (iii) the formation of co-evolving eco-systems, where regional institutions and organizations contribute to the entrepreneurial, innovative and competitive capacity of local SMEs (EU Commission 2021, 7–8).

The European Commission has incorporated these recommendations and priorities within specific policies and programs that have led to the formation of (1) European cluster partnerships and collaborations, which are financed through programs intended to promote innovation, internationalization and excellence of industry clusters; (2)

advanced and enabling technologies for industry and inter-regional investment that are monitored through effective practices of 'technology watch', 'sectoral watch', and 'product watch', and promoted through projects (e.g. the PITCCH project) that enhance the structured collaboration between public technology centres, big corporations (as technology seekers) and SMEs (as prospective technology providers); and (3) the promotion of the green transition through a network of expert organizations and a knowledge platform that includes good practices and appropriate tools, and (4) the setting up a toolbox for policy makers that are often country-based such as with the Maltese Marsa program for the maritime industry, Israel's Magneton program for technology breakthrough and transfer, and Ireland's Technology Centres which are supposed to promote R&D collaboration between big corporations and Irish companies, or the Innovation Centre Iceland to promote innovation across Iceland SMEs, among many others. These policies and programs are offered to enhance the contribution of industry clusters to the competitiveness of the European economy (European Commission 2023).

3.2.2. Impact of these cluster policies

This approach is being implemented under a set of powerful exogenous shocks that the European Union has been facing in recent years. Brexit, Covid-19, and the Ukraine war with the related gas crisis in 2022/23 have put enormous pressure on European countries. The macroeconomy has been suffering from high inflation, exchange rate depreciation (vs US dollar), employment issues (e.g. health and transportation workers on strike), and finally limited economic growth/recession. Yet, the whole European economy is responding. The economy is expected to grow by 2.7% in 2022 and 1.5% in 2023. Growth in the EU economy will grow by 2.7% in 2022 and 1.5% in 2023. Growth in the euro area is expected at 2.6% in 2022, then moderating to 1.4% in 2023. Annual average inflation is projected to peak at historical highs in 2022, at 7.6% in the euro area and 8.3% in the EU, before easing in 2023–4.0% and 4.6%, respectively (EU Economic Commission 2022). These macro data show the overall effective approach taken by the European Union and its member states in contrasting the effects of those exogenous shocks and crises.

This successful response is closely connected to our core topic (i.e. clusters and cluster policies). In fact, research undertaken by the European Commission in 2020 analysed the impact of the Brexit exogenous shock (and the first wave of Covid) and showed evidence on 2,950 clusters in 51 industry sectors that account for 62 million jobs, half of the jobs in exporting industries and approximately one in four across the Union (Hollanders and Merkelbach 2020, 13). In addition to displaying the heterogeneity of such industry configurations with a group of high-performing clusters, vis-à-vis a larger group of medium-performing clusters, and another larger group of basic-performing clusters, Hollanders and Merkelbach (2020, 13–15) show that the average productivity of these clusters has been higher than average productivity for non-clustered industries. In average, clusters show a much higher than average industry productivity (+25%). They also show a much higher productivity in exporting industries than in the case of non-clustered exporting industries (+35%). This higher-than-average productivity can be found also in medium-performing clusters (+15%) and basic-performing clusters (+10%) vis-à-vis non-clustered industries across the European space.

A critical area of (cluster) competitiveness is innovation. Within the EU the work of the Pro-Inno research office in Mastricht is central. They are studying the success of national and regional innovation systems across the continent (Hollanders 2021). With its limitation the RIS 2021 gives a clear picture of how European regions evolve (and the clusters that are typically embedded in their regions and representative of the regions' competitiveness). There are differences, which make up for a distinction among innovation leaders (e.g. some German regions, Swedish regions, Dutch regions, among others), strong innovators (French regions, Belgian regions, German regions, Finnish regions, a few Italian regions, among others), moderate innovators (some Italian regions, some Spanish regions, among others), and modest innovators (most Polish, Slovak, Romanian, Hungarian, Bulgarian and Greek regions, with most Southern regions in Italy, Spain and Portugal). Within this context, countries and regions from Estonia, Lithuania and the Czech Republic show the penetration of innovation policies in the typically lagging Central and Eastern Europe, thus deepening the catching up process across European regions. Simultaneously, Southern European regions are also going through a catching up process thanks to their good performance in tourism after Covid (Oxford Economics 2022). Also in this case (as for the more specific cluster policies), this success is due to structuring innovation policies and programs that not only promote the wider formation of RISs across these catching-up economies (Hervas-Oliver, Parrilli, and Sempere-Ripoll 2021), but that in particular connect the work of these RISs with local industry clusters so as to help transfer knowledge and technology directly to local SMEs and help them becoming more competitive and resilient within relevant supply chains (Belso-Martinez et al. 2018).

4. Current research policy priorities

In spite of these several elements of consensus, research on cluster competitiveness continues. Several fields are identified and targeted through research strands that attempt to cover further gaps and research questions. The first important stream of current research emphasizes an element that has been tackled in the past but with a different nuance today. It is the importance of networking and cooperation. This was identified in the early days of research on districts and clusters (Piore and Sabel 1984; Pyke, Becattini, and Sengenberger 1990; Putnam 1993). However, today the discussion on networking and cooperation refers explicitly to the knowledge realm, knowledge exchange and innovation promotion. This was anticipated by Belussi, Sammarra, and Sedita (2010), and then broadly emphasized through the wide bibliographic research of Sedita, Caloffi, and Lazzeretti (2018) and evidenced by recent contributions of Belso-Martinez et al. (2018), Hassine and Mathiey (2020), Graf and Broekel (2020), Lucena-Piquero and Vicente (2019), Anic and Corrocher (2022), and Rypestol et al. (2021) for the cases of Spain, France, Germany, Croatia and Norway.

The public (policy) effort to promote knowledge and innovation across SME clusters is not to be taken for granted. The German Bio-Regio case shows the impact on (larger) knowledge networks being stronger during the duration of the public policy instrument (e.g. R&D subsidy), while shrinking once this finalizes (Graf and Broekel 2020), thus showing a certain dependency of businesses on such policy schemes. However, as Graf and Broekel show, there are elements of 'behavioural additionality' that need to be

factored in beyond the standard input and output additionalities and that will produce further positive impact over time (Ibidem; see also Aranguren et al. 2014, in Spain). In any case, it is the collaboration of private and public organizations that is essential to promote development opportunities that otherwise would not be available to local SMEs. This is the case of policy actions (e.g. technological promotion) that are supposed to overcome network failures while generating advanced knowledge and innovation as in the case of the Toulouse aerospace cluster in France (Lucena-Piquero and Vicente 2019) or in Spain (Belso-Martinez et al. 2018). Also in this case, some conditions need to be set to bolster such opportunities. This is also the case of the Croatian clusters where less competitive clusters use networking as a defensive measure (e.g. for lobbying), whilst most competitive clusters use it as a dynamic measure, e.g. for knowledge exchange, innovation and investment in technological infrastructures (Anic and Corrocher 2022).

A second area of ongoing research is cluster policy evaluation**.** This area stresses the importance of continuous assessment of the way cluster policies are implemented. As these policies require resources and take time to materialize, then it is critical to keep them under close observation so as to redirect actions in case they do not provide the expected outcomes. As mentioned above, the outcome of cluster policy should be considered broadly and sometimes with an 'out of the box' approach. This entails not to focus only on the so-called input and output additionality of policy that are expected to produce an immediate impact on productivity and sales (Czarnitzky and Hussinger 2018), but also on behavioural additionality that entails a different type of impact (Clarysse, Wright, and Mustar 2009). The latter produces changes in the way knowledge and innovation activities are organized (e.g. through teamwork or bottom up communications within a wider participatory approach), which tend to produce significant effects over the medium to long term (Graf and Broekel 2020; Aranguren et al. 2014). In any case, the use of public resources and policy tools always need to go hand in hand with the purpose of attaining objectives of efficiency and effectiveness. This is confirmed through the work of Cantner, Graf, and Rothgang (2019), and Kiese (2019) in Germany; and Aranguren et al. (2014) in Spain. These studies stress the important behavioural additionality produced by cluster policy in the selected regions. Both Kiese (2019), and Aranguren et al. (2014) stress the importance of cluster policy for the qualitative improvements in the organizational (participatory) capacity of regions and clusters to manage resources and promote a stronger regional industrial competitiveness.

A third appealing research strand on cluster policy still focuses on the evolution of the afore-mentioned 'smart specialization strategy'. The relevance of the current environmental challenges discussed in critical international summits (COP26 in Glasgow and COP27 in Sharm-el-Sheikh), and the formal commitments taken through the Paris Agreement in 2016, take the international scholarly community to devote time and energies to explore a wider approach to cluster competitiveness that includes the sustainability challenge. This is currently studied by McCann and Soete (2020), Volkman et al. (2021), and Fitjar, Benneworth, and Asheim (2019) that realize the need to move beyond S3 to develop S4 + which includes a special attention to sustainable and inclusive growth.

McCann and Soete (2020) stress the importance of implementing the European Green Deal (EGD) to organize 'a green specialisation area through innovation'. In a way, it is

not innovation per se that guarantees sustainability and competitiveness, but eco-innovation that needs to take the lead within business objectives and strategies. This approach may raise trade-offs that need to be taken on to attain a more inclusive development framework, 'embracing transformative innovation for systemic transitions, reaping the opportunities and alleviating the threats of the global ecological and digital transitions' (McCann and Soete 2020, 8–9). Complementarily, Volkman et al. (2021) emphasize the importance of sustainable entrepreneurial eco-systems to attain the afore-mentioned EGD through a novel entrepreneurship that 'embraces the economic, social and ecological dimensions of sustainability as part of its core business model' (Volkman et al., 2021, 2).

In a similar vein, Fitjar, Benneworth, and Asheim (2019) develop a regional Responsible Research and Innovation (RRI) framework that is supposed to introduce the sustainability challenge within smart specialization policies (RIS3). It is the combination of these two types of innovation policy (RRI and RIS3) that is likely to generate more effective, inclusive and sustainable (cluster and regional) policies for social and economic development. In fact, the 'lack of attention to geography in RRI is matched by the embeddedness of RIS3 policies in regional processes, whereas the lack of attention to broader societal interests in RIS3 is matched by RRI policies' emphasis on innovators' responsibility to stakeholders' (Fitjar, Benneworth, and Asheim, 2019, 780). The development of an integrated framework where dimensions of anticipation, reflexivity, inclusion, and responsiveness are pulled together helps in combining effectively those two innovation policy approaches. This approach is certainly incorporated by the recent discussion of the European expert group on clusters (2021) and the European Commission policy framework (2023) that stresses the importance the green transition through a network of expert organizations and a knowledge platform that includes good practices and appropriate tools (see section 3.2.1 above).

Overall, these three strands of research represent the main areas of commitment, investment and practice of policy makers (European Commission 2023). They are central in the attempt to develop more sustainable and effective cluster and regional policies, although they may leave some core aspects out of the landscape. This is where we introduce our main contribution, which is discussed in the following section.

5. Research gaps on cluster policy

5.1. Research on social heterogeneity within clusters

Despite this important spectrum of research areas and questions taken up by scholars over the years, gaps still exist. In particular, there is very little research on policy for the formation of localized 'social capital'. This is naturally the realm of 'national social policy'; though we argue that it has also a local grounding as Malecki (2012) indicates when talking about social capital: 'Across the board policies will not work, since both public intervention and public/private cooperation are needed to stimulate network formation through the building up of social capital in each region' (Malecki, 2012, 1033). The first of these elements (i.e. public intervention) is eminently 'national', but the second is pretty 'regional', thus requires local efforts and local policies. Echoing Nauwelaers (2001) and Lorenzen (2007), also Malecki stresses that the regions with a low level of

social capital need to make an effort to build it up, and this implies a proactive role for regional/local (cluster) policy.

This was Nauwelaers' approach when she talked about the importance of a 'regional' cluster policy that combines social capital ('orgware' in her language) with 'hardware' (physical capital) and 'software' (human capital). Here

> the notion of social capital tries to capture the capacity of the set of territorially embedded actors to organise around common goals and to develop trust-based relationships, as mentioned above … (these) policies can play a role in influencing even these non-classical, difficult to grasp, determinants of innovation (Nauwelaers 2001, 96).

In a similar vein, in the Spanish/Basque context Etxabe and Valdaliso (2016) emphasized the role of specific local institutional agents (i.e. cluster associations) and the participation of these and other local agents (e.g. firms, technology centres, universities) to relevant local networks of collaboration as a means to promote not only knowledge exchange but, in particular, bridging social capital.

Now, in this aspect an additional element needs special consideration. It is long known that the element of networking and cooperation can only work when economic agents, individually and as organizations (e.g. chambers of commerce, cluster organizations, industry associations) share a common pool of values, norms, routines that lead to increased trust and reputation that, in turn, promote cooperation and knowledge exchange while reducing the related transaction costs (Becattini 1990; Trigilia 1992; Putnam 1993). However, something has recently thoroughly changed; this is social capital, which is still central but in a different format. In fact, we are no more in the context of homogeneous societies and communities where bonding social capital was enough to develop agreements, lower transaction costs and enhance cooperation and external economies. Instead, we are in the context of heterogeneous communities that often produce cultural clashes in terms of values, norms, routines, trust and cooperation (Putnam 2000; Malecki, 2012; Parrilli 2012; Parrilli, Montresor, and Trippl 2019; Dei Ottati 2014, 2018; Antonietti, Rodriguez-Pose, and Burlina 2022). This situation is well represented by the fashion district of Prato where a dense Chinese community has grown in the past two decades. Recognizing that it is common across all ethnic communities immersed in a new host country/region, Dei Ottati (2014, 1260) stresses that 'The success (of this community) in Prato (depends on) the informal economy, i.e. the practice of conducting economic activity with (some) disregard for the host country regulations concerning employment contracts, social security, fiscal regulations and local taxes'. Of course, these practices generate clashes between local and foreign businesses that produce social fractures while jeopardizing the former local trust-based cooperation. Due to this heterogeneity, within such contexts the former low transaction costs and high local economies of scale and scope are lost, while the agreement on a novel 'social contract' is required. This is what Putnam (2000) refers to when he talks about 'bridging social capital' that requires the capacity to organize collective initiatives that connect different people and economic agents in society (e.g. voluntary activities, political engagement) so as to address new common problems, objectives and strategies together (Parrilli 2012; Parrilli, Montresor, and Trippl 2019).

Local societies need to move beyond the traditional 'bonding social capital' to promote the formation of weak ties (Granovetter 1985) and bridging and linking social capital,

where the latter involves the common understanding and cooperation between the socio-economic agents and the local institutional and public organizations and authorities (Putnam 2000). This will help to build a renovated and wider cooperation capacity across larger and more heterogeneous segments of local communities, thus making the clustering of industries work effectively in the current changing social context. In other words, it implies the formation of a higher-order social capital that exceeds the traditional boundaries of local communities as discussed at the end of the past century by Becattini (1990), Trigilia (1992) among others, to incorporate the contribution of foreign communities within the local socio-economic boundaries. This calls for the promotion of mutual understanding and engagement leading to social integration and cross-cultural collaboration especially in relation to the communities-on-the-move that have become common and central today in our societies (Dei Ottati 2014; Parrilli, Montresor, and Trippl 2019; Antonietti, Rodriguez-Pose, and Burlina 2022). As a result, these foreign/ethnic communities can contribute to innovation and entrepreneurship in host economies, as a few studies have recently shown. D'Ambrosio et al. (2019) and Schneider et al. (2019) found their contribution to innovation in the regions of Spain and Germany; while Bettin et al. (2019), Tavassoli and Trippl (2019), and Mickiewicz et al. (2019) proved their contribution to entrepreneurship respectively in Italy, Sweden and the UK.

Overall, these findings enhance the need to study social capital within local production systems, and in particular across the new local/regional communities where people meet and work together (e.g. clusters and industrial districts) and sometimes generate tensions that reduce the overall competitiveness of these important industrial collective actors. Therefore, echoing the former argument set by Nauwelaers (2001), Lorenzen (2007) and Malecki (2012), a higher-order social capital is needed, and this requires a cluster/local policy that helps to reap positive impact from the more heterogeneous social forces that form our societies today.

5.2. Prospective social cluster policy

Social Cluster/local Policy needs to entail measures oriented to pull together people from different origins with a common purpose (i.e. local socio-economic development) through personal and collective commitment and joint actions. This novel approach certainly needs to be framed at the supra-national (EU) and national level, although its implementation can and should be organized at the regional/local/cluster level (Nauwelaers 2001; Flanagan, Uyarra, and Wanzenbock 2023; Van Langenhove and Kingah 2016). This will occur through several initiatives that are identified in advanced practices in selected local/regional economies. The first of these refers to the social-economic infrastructures. For instance, in the city of Seattle, the council in collaboration with local institutional agents and scholars/advisors have identified areas where a purposive local environment can be built (APA 2016). This refers to the city infrastructures that (i) improve transport communications to enable the local population to move more easily from point A to B, thus reducing their commuting time; (ii) promote social meetings, gatherings, and socialization in general. With the former (i.e. transportation infrastructures), the cluster/local population is given the opportunity to waste less time in commuting and to lower the emotional stress linked to such compulsory commuting-to-work practice. This generates higher spare time that individuals and households can use for socialization purposes, the creation

of bridging social capital that enhance the opportunities to raise trust and cooperation also across firms and economic activities (Montgomery 2013). Social infrastructures refer also to parks, gardens, playgrounds, theatres, museums that form the natural environment for more relaxed social encounters that enhance the opportunity to grow weak ties and bridging social capital locally (APA 2016).

A second area for cluster policies – echoing Putnam's (2000) considerations – refers to policies and programs that promote political action and the work of charities and political organizations, which are central in raising awareness about the local/cluster social heterogeneity. This process will enhance the possibility to unite forces to address common issues and generate a more comprehensive understanding that leads to reducing transaction costs and promoting novel joint actions that support business competitiveness and long-term local/cluster sustainability projects. As suggested by Malecki (2012) and Nauwelaers (2001) this can be structured at the regional/cluster level as these types of organizations are often context-specific, while having interest in open cooperation through local cultural and political representation (Morris 2021). It is a type of activity that can also be supported and stirred by local development agencies, chambers of commerce, trade and business associations, cluster organizations, among others.

A third field of regional social (cluster) policy intervention is education**.** In this case, it is crucial not to think only in terms of skills and competences, which is normally tackled at the national level, but also in terms of the cultural breadth of education that is supposed to form wider scope for mutual understanding, knowledge, appreciation, thus leading to new learning processes that propel economic activities over time. This is also to be framed nationally, though specific applications can be made at the regional/local level (Goddard 2013) because the specific foreign communities that are present in the regional territory may be unique to that territory (e.g. the Indian and Chinese communities in Silicon Valley, Saxenian, 2012; or the Chinese in Prato, Dei Ottati 2014). The opportunity to go beyond the technical, STEM-based orientation, needs to be included to help people (especially young people) to learn about different cultures in a way that connects both recreative practices and working routines (Parrilli 2012). This will help to set the bases for a more profound understanding of what is expected in life, society, economy from all the old and new members of the local community.

A fourth field of intervention is the job market**.** This needs to become more fluid and based on a domponent of merit combined with community engagement to (i) create opportunities for promoting the effective development of individual skills and capabilities together with (ii) an ethical approach that fits within the objective of uplifting the future of the local community (Imbroscio 2016). Until this happens, society functions in the form of closed silos where some will have excess opportunities, while others will be geographically, socially and economically marginalized (Imbroscio 2016). This situation may be particularly strong in specific local (cluster) environments where action is required to favour higher mobility and the development of role models across the different communities that form the new spectrum of the local social economy.

6. Conclusions

With this paper we show the evolution of cluster policies over a significant period of time (1990s-2020s). In a first moment (1980s-1990s), the focus was on promoting hard

networking and cooperation to increase scale and scope economies within clusters, thus enhancing the competitiveness of their firms (Schmitz 1992; Belussi 1999; Ceglie and Dini 1999; Pietrobelli and Rabellotti 2007). In a second moment (2000s-2010s), the novel framework of smart specialization was bolstered as a way to favour the inter-regional coordination of industry specializations (Foray 2014; 2016; McCann and Ortega-Argiles 2015) and the development of new capabilities through the related varieties framework (Boschma and Capone 2015; Balland et al., 2019). In the current period (2020s), the knowledge economy has come to the fore and has modified the former hard approach to networking and cooperation (Sedita, Caloffi, and Lazzeretti 2018; Belso-Martinez et al. 2018; Hassine and Mathiey 2020; Graf and Broekel 2020). Continuous cluster policy evaluation is also developed as a means to produce more effective and efficient regional government interventions (Cantner, Graf, and Rothgang 2019; Kiese 2019; Graf and Broekel 2020). Moreover, the importance of sustainability is stressed in order to move beyond the RIS3 approach towards a regional responsible research and innovation approach (Fitjar, Benneworth, and Asheim 2019; McCann and Soete 2020; Volkman et al. 2021).

Current cluster policies have been effective as we have seen from some data in section 3.2.1 New policies and measures are being discussed and put in place in relation to the three main strands of research identified above (section 3.2.2). The European Commission (2023) is well-aware of this through its overarching approach and program displayed through the work of the Expert Group on Cluster Policy as well as in the Commission's programs currently in operation. These include: the promotion of knowledge networks (e.g. through the widespread formation of public/private cluster organizations); cluster policy evaluations (e.g. program-specific effectiveness assessments); and sustainability-led subsidies and initiatives (e.g. regional cluster organizations specifically driven to raise the environmental sustainability profile of the region, for instance most Local Enterprises Partnerships in UK regions or the ACLIMA cluster organization in the Basque region in Spain) (Borowik 2014).

Moreover, our argument and proposal is that a complementary sphere needs to be introduced and supported within a novel approach to cluster policy. This is the social policy component that derive from the afore-mentioned considerations around the new heterogeneous local and regional economies of Europe. Usually, social policy is the remit of national governments (e.g. Department of Levelling up, Housing and Communities in the UK, Ministry of Labour and Social Policy in Italy, Ministry for Solidarity and Health in France, among others). However, we recognize that (1) the social element differs from region to region and, (2) the social component directly affects the way local production systems (e.g. clusters) function. For these reasons, the regional/cluster policy level needs to step in and offer policies and programs to promote a renovated 'social embeddedness of economic action'. For these reasons, as Nauwelaers (2001), Lorenzen (2007) and Malecki (2012) underlined, the 'cluster policy' needs to entail a social component also at the regional/local level.

All these important areas of policy reflection and action need to be informed by principles of tolerance, opening and mutual exchange, but also responsibility and commitment towards the formation of public goods (see also Asheim's and Parrilli 'creative knowledge environments', 2012; or Imbroscio's 'community paradigm', 2016). This is likely to generate a purposive environment where all communities and (heterogeneous)

people participate, share and contribute, thus lowering the risk of social clashes and enhancing the opportunities for trust and cooperation which are the essence of cluster competitiveness and sustainability (Parrilli 2012; Imbroscio 2016).

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