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**KNOWLEDGE
DYNAMICS
IN CLUSTERING
PROCESSES**
A PUBLIC-PRIVATE
INTERACTION PERSPECTIVE



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ISBN

979-12-218-0248-1

IST EDITION

ROME 7 OCTOBER 2022

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ACKNOWLEDGMENTS

This volume develops topics that were the subject of research conducted at the University of Urbino and at the University of Gävle (Sweden).

Numerous people have stimulated and encouraged the study and research activities underlying this work, the responsibility for which must be attributed exclusively to me.

First and foremost, I am genuinely thankful to my supervisors, Professor Alessandro Pagano and Professor Roberta Bocconcelli for their consistent and tireless support. Thank you for teaching me how to do research, for introducing me to the IMP world, and for your unique attitude towards the academic world, for your academic supervision but also for the passion and for your human attention towards me, which have affected me positively and helped me in personally improving and growing.

The choice to explore the topics covered in this volume also stems from the many stimuli I have received during my study and research career. For this, I want to thank the

Professors of the Department of Economics, Society, and Politics from the University of Urbino, who have provided me with training and guidance. I would like to thank the scholars from the University of Gävle, who welcomed me during my visiting period in Sweden, and that have directly or indirectly contributed to part of this work.

This volume was realized thanks to the availability of the respondents from the different institutions and organizations that took part in the two empirical studies. I express my gratitude to them for generously sharing their time, experience, and insights with me.

I want to thank Alessandro Bellocchi and Dalila Ribaudó – who entered my life as Ph.D. colleagues but turned out to be valuable friends – for their precious support. I would also like to thank my co-author Serena Galvani: bringing together our different interests and skills has enriched me with new ways to look at research.

The deepest gratitude goes to my family, my mum, my dad, and my sister. Thank you for giving me unconditional encouragement and being my number one supporter even when you had no idea what I was doing.

INTRODUCTION⁽¹⁾

Clustering and knowledge have been at the core of the policy discourse and of academic research for a long time (Brenner, 2007; Martin and Sunley, 2003; Rebolledo and Nollet, 2011; Speldekamp et al., 2020; Tödtling et al., 2006).

Clustering processes have been described as “*one of our times’ politically most wanted economic phenomena, expressed in policy guidelines on local, national, regional and transnational levels*” (Waluszewski and Wagrell, 2013: 1), and clustering has become a “benchmark” for academics studying economic change through analyses at the territorial level (Sforzi, 2015). At the same time, knowledge has become

(1) This volume draws from a research project conducted by the author in 2018-2021 during the Ph.D. program in Global Studies, international economic policy, business, and governance at the University of Urbino. Part of this work has been presented and defended (March 2021) in the form of a dissertation with the title “The combination of local and global knowledge in clustering processes: the role of public private interaction”.

quantitatively and qualitatively more critical, as the stock of knowledge on which the economic activity is based today plays an important role (Brenner, 2007).

These two themes are deeply interrelated, and research has highlighted the importance of turning our attention to knowledge sharing within clustering processes. The relationship between clustering processes and knowledge flows has attracted a significant amount of research (Bathelt et al., 2004; Malmberg and Power, 2005; Dahl and Pedersen, 2004), as knowledge sharing is crucial for the understanding of clustering preconditions, functioning and outcomes. Due to clustering advantages, the extent of re- and multiple combinations of knowledge seems to be more pronounced in industrial clusters than in non-localized inter-firm networks (Sammarra and Biggiero, 2008).

One might wonder what remains to be discovered in the relationship between clustering and knowledge, as these topics seem to have been widely investigated from different perspectives, and the literature on these phenomena appears to be high-saturated (Leick and Gretzinger, 2020). To answer this question, first, we need to acknowledge the recent emergence of new trends and mechanisms in the dynamics of knowledge flows in firms' agglomerations, which have brought up open questions that deserve further attention. In fact, in the light of the challenges and opportunities of pervasive processes such as globalization and digitization (Halse, 2020; Lazzeretti et al., 2019), the conditions, mechanisms, and effects of knowledge sharing appear to be under-explored. Second, we need to introduce the third focus of this study – with the first two being clustering processes and knowledge – that is, public-private interaction. Indeed, an essential role in the patterns of change and increased

complexity is played by the interaction between public and private actors within clustering processes. Public-private interaction is an established trend of contemporary society (Waluszewski et al., 2019) and it involves further interaction with a diversity of, owing to the synergies and to the cross-fertilization processes it implies (Crespin-Mazet et al., 2013).

Against this background, the focus of the study is on the interactive aspect of knowledge exchange in clustering processes. In particular, this research accounts for the importance of the geographic space as a catalyst for relationships and not just as physical infrastructure (Schillaci and Gatti, 2011). By taking a public-private interaction perspective, based on the phenomenon-driven Industrial Marketing and Purchasing approach (hereafter IMP) (Håkansson et al., 2009), it aims to provide an understanding of how knowledge flows influence and provoke changes in clustering processes. The main contribution is to address a “missing link” and enhance scholarly and practitioner understanding of the interaction processes for knowledge recombining in clusters in a public-private interaction perspective.

Going more into depth into the changes identified above, one of the aspects introduced relates to the new dynamics of knowledge in firms’ agglomerations. Although clusters and districts have remained a focus of the economic debate both at the national and supranational level, empirical evidence shows that they are suffering from external factors, such as the pressure of globalization, shaped by the emergence of aggressive international competitors in low-cost countries, by the rising complexity of technology and knowledge, and the increasing organization of production. The rapid rise of globally fragmented production has

enhanced competition and provided alternative sources of inputs and technology, encouraging regions to specialize in narrow slices of the value chain (Murphree et al., 2020). At the same time, evidence also shows an increasing structural fragmentation both at the firm and at the institutional level, which is turning clusters and districts remarkably different organizational systems, following different trajectories within a rapidly changing context. Fragmentation is apparent when we look at traditional cohesive districts, which now lack close relationships and display a lower degree of cooperation and sense of belonging, as well as when we account for more formal structures, whose temporary initiatives may involve firms interacting episodically but lacking integration and internal cohesion (Palmer et al., 2017; Dana and Winstone, 2008). We are witnessing the fading of the so-called “district effect”, a tendency towards increasing heterogeneity within and between clusters, new strategies of internationalization, innovation, and access to external knowledge (Foresti et al., 2009; Iuzzolino, 2008; Milanesi et al., 2016). As firms struggle to cope with an increasingly turbulent economic environment, there is widespread recognition that knowledge has become the most strategic component of firms’ resources (Grant, 1996).

Second, changes also concern knowledge flows within clusters and districts, with an increasingly complexity of specific technological and market knowledge, and transversal knowledge, driving innovation in clusters and industrial districts. In recent years, technologies, which have tremendously improved the way knowledge is stored, exchanged and transferred, have been developed (Brenner, 2007). However, it would be wrong to think that just technological knowledge is getting more complicated. The complexification

of modern technologies increases, in turn, the salience of non-technological knowledge, such as market and managerial knowledge (Sammarra and Biggiro, 2008).

This is provoking a shift from the traditional view of districts as labs for localized learning and tacit knowledge towards globalized systems, highlighting the importance of internationally developed knowledge and competences and of combining and linking distant learning with the concept of absorptive capacity. We can talk about a dual local/global logic of localization and knowledge flows around nodes of firms interconnected by a global framework (Belussi and Sedita, 2012; Mitchell et al., 2014). From a dynamic perspective, the mix of local and non-local knowledge sources has been deemed essential for cluster development. *Local* since knowledge, relationships, and interaction are exchanged in a specific place and environment; *global* as there has been an increase in codified knowledge, and even tacit knowledge has become progressively more explicit and transplantable (Nassimbeni, 2003). Indeed, the dichotomy between global and local knowledge represents a challenge to clusters, with patterns of connections and knowledge acquisition reflecting the dichotomy between external knowledge and locally embedded one (Mitchell et al., 2014).

The local/global dimension is not a new one in itself, nor is the role of institutions and public actors for clustering. Yet, today's complexity of markets and technologies gives rise to emerging public-private interaction modes for accessing new knowledge. Therefore, the complexity of knowledge flows raises the question of if and how these processes could overcome social dynamics and the role of localities (Lazzeretti et al., 2019).

Third, the issue of public-private interaction lacks a systematic investigation of the fine-grained mechanisms of interaction (Xing et al., 2018). As different studies have suggested, more research is needed to understand the development of public-private relationships and cooperation within clustering processes. Despite the variety of public actors, existing on different levels and assuming different roles in business networks, these have been comprehensively being categorized as political or institutional actors (i.e., Bengtson et al., 2009; Welch and Wilkinson, 2004) and they have been typically investigated as customers in public procurement projects (Mattsson and Andersson, 2019), mirroring the classical seller-buyer relationship in business networks (Waluszewski et al., 2019).

This explains the recent calls for a better understanding of how cluster firms engage in knowledge exchanges (Alberti and Pizzurno, 2015; Speldekamp, 2020) and of the interplay of local and external knowledge-related exchanges (Maskell, 2014). Cooperative mechanisms and collaborative patterns assume in this context new forms through interaction and interdependencies involving the public and the private sphere (Nissen et al., 2014; Xing et al., 2018).

In particular, fragmentation and knowledge complexity guide the emergence of a new push for cooperation, which, at the same time, points to a gap concerning the analysis of “collective” interaction. Cooperation and collective interaction cannot disregard the role of public actors, who interact not only with single firms but also with clusters and networks. Such collaborations, involving the public and the private side, have become of increasing concern in practice and academic literature (Mattsson and Andersson, 2019) as they offer a pathway to tackle different challenges (Xing et al., 2018).

The interesting aspect is the collective dimension of activities, which directly impacts agglomeration vitality. Given the high complexity of firms' agglomerations, the collective dimension is neither automatic nor obvious. Co-location and geographic proximity do not explain in-depth cooperation and active forms of collective intentionality (Schillaci and Gatti, 2011). Therefore, the collective dimension can be qualified as the integration and co-evolution of the multiple and varied individualities (individuals, groups, organizations, institutions) and as an approach that orients individual behavior towards a systemic perspective (Schillaci and Gatti, 2011).

Within this context, the empirically-based IMP tradition could be deemed a useful and appropriate approach due to its phenomenon-driven nature aimed to provide a picture of the business world, and, thanks to some critical dimensions investigated and developed, such as those of interaction, network dynamics, relationships, and embeddedness, it has the potential to generate original insights on the business landscape (Håkansson and Snehota, 2017). In particular, it contributes and integrates knowledge on different aspects, such as clusters and space, public-private interaction, knowledge, and collective level of interaction, populated by several varied species engaged in economic exchange, creating an intricate web of interdependencies across time and space, across the borders of private businesses and public bodies (Håkansson and Waluszewski, 2020).

Thus, IMP could offer insights into the often-overlooked complexities interactions are embedded in, as organizations are part of a broader context of interdependent and interconnected actors, and it provides useful, flexible frameworks suitable to investigate the complexity of phenomena. The

IMP approach's basic notions imply that businesses have to operate in a context of private and public entities as well as other societal actors (Elbe et al., 2018). The IMP approach traditionally investigates business and non-business relationships, and recent streams have started dealing with private-public interaction (among others, Kronlid and Baraldi, 2020; Munksgaard et al., 2017; Waluszewski et al., 2019).

After introducing the theoretical underpinnings (Chapters 2 and 3) and methodological considerations (Chapter 4), two case studies (Chapter 5) are presented. The first case study examines the dissemination of Industry 4.0-related knowledge, exploring the main mechanisms for its spreading (Belussi and Sedita, 2012; Lazzeretti and Capone, 2016) and highlighting the main factors shaping such processes in the context of an Italian industrial district active in a traditional sector. The analysis has been conducted on the evolution of Industry 4.0 (I4.0)-related knowledge dissemination in the industrial district, by focusing on the three dimensions of actors, activities and resources. Main findings concern the absence of clear sectoral and geographical boundaries in the upgrading of knowledge related to I4.0, disjointed institutional and business efforts pertaining to initiatives for the diffusion of such knowledge, and the engagement in deliberate measures leading to a combination of formal and informal initiatives involving public and private actors, such as regional governments, universities, cluster initiatives, network alliances, and hybrid actors acting as knowledge brokers.

The second case study is set in the context of an internationalization project implemented by a Swedish formal cluster initiative aimed at exchanging internationalization knowledge. Key results of the analysis emphasize

the formal cluster's role at the governance-level as orchestrator, supporter, and accelerator, but also actively participating in relationships with local and international partners (Colovic and Lamotte, 2014; Andresen, 2021). The formal cluster has been supported by other public actors involved in the project, which have acted as providers of resources at the operational level. On the private side, firms assumed the customers' roles but played different roles depending on their degrees of interest, commitment, and heterogeneity. Knowledge-related activities aimed at spreading internationalization knowledge have occurred at multiple levels (inter-organizational, intra-project, inter-project), with different timings, implementing various activities (from individual coaching to trips abroad and workshops), and involving heterogeneous resources.

Chapter 6 summarizes the findings of the case studies and discusses them in relation to each other and to the overarching aim of the volume. The final chapter outlines conclusive remarks, as well as managerial and policy implications. Finally, the limitations of the study are pointed out and an agenda for future research is suggested. Indeed, the peculiarities of knowledge flows, clustering processes, and public-private interaction are disentangled in a review chapter and two empirical analyses dealing with different aspects of this phenomenon.