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## **Editorial: Diamonds in the rough, what does it take for clusters and technoparks to become masterpieces?**

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Ever since the success of the Silicon Valley, and especially with the growth of high-technology culture, other countries and regions have been trying to replicate this experience and to create highly dynamic entrepreneurial and innovative areas. While some of such attempts were successful (though, arguably, none yet as much as the 'model' itself), many of them were not. It is therefore important to examine the critical factors that underpin the creation of successful technology districts and clusters.

While it is well-known that the development of technoparks, science parks, technology districts and clusters generally requires appropriate infrastructures (e.g., legal, communication, transport), a strong presence of venture capital firms in the area, as well as a well-planned design (bottom-up, up-down or a mixture of two), the presence of all of these components, does not guarantee neither immediate nor long-term success.

Thus, the main aim of this special issue is to advance our theoretical and empirical understanding of technology districts and clusters and to examine the factors that play a key role in the success and the development of technology districts, clusters, technoparks and science parks in different countries and regions. As a matter of fact, the seven articles in this special issue focus on the creation, development and success of technology districts and clusters in a wide range of countries: Austria, Canada, Czech Republic, France, Hungary, Israel, Italy, Poland, Slovakia and Slovenia, thereby providing a good (albeit not exhaustive) overview of local and regional experiences.

Nowak focuses on the specific mechanisms that shaped Israel's high-tech clusters and investigates the necessary steps towards successful creation of technology clusters in general. In particular, the author argues that regions need to carefully assess and identify the potential of each area and carry out measures that will transform this potential into usable assets. Nowak also emphasises the importance of considering country-specific settings when building country's or region's technological capabilities. This means that specifically designed policies need to be introduced and that the implementation of such policies needs to be consistent with the specificities of the country or region. Hence, policies that have 'worked' somewhere are unlikely to be transferable to other countries and regions without serious adaptation to the specific context of the target region.

Nowak's discussion of the identification of regions' potential resonates well with the increasingly popular concept of smart specialisation (SmSp). Indeed, SmSp argues that different regions have different abilities to absorb, disseminate and exploit general purpose technology. In their article, Rosiello et al. explore some of the issues associated with the SmSp logic and, in particular, its implementation. Based on three case studies (Lower Austria, Lithuania and Saskatchewan) that correspond to economies at different stages of development, Rosiello et al. identify specific challenges that regional innovation policy need to overcome and investigate how SmSp can be structured to help overcome these challenges. In particular, Rosiello et al. show that entrepreneurial opportunities can be identified and explored by a variety of stakeholders and that multi-stakeholder involvement is needed for successful coordination of technopoles and clusters.

Coletti and Di Maria also investigate the issue of cluster development, but this time from the perspective of the management process within the cluster. Based on 96 surveys conducted with cluster management in Austria, Czech Republic, Hungary, Italy, Poland, Slovakia and Slovenia, one of their main finding is that while cluster managers generally are highly proactive and positively minded individuals seeking to make an impact, they often lack the managerial skills and knowledge required to develop their particular cluster. Another key finding is that, regardless of their origin and localisation, a critical problem all clusters face is the difficulty to evolve from one stage of development to the next one, until they have become fully functional clusters and achieved a certain level of effectiveness and stability. Furthermore, Coletti and Di Maria emphasise that this is particularly the case for clusters that rely on public funds, as they, more often than others, struggle to achieve economic viability.

Adopting a 'user' perspective, Castellano et al. investigate the relationship between companies and clusters. One of the findings in this article is that companies can benefit from balancing, on the one hand, agglomeration and clustering (territorial anchorage) and, on the other hand, localisation in different environment (nomadic approach) to gain legitimacy. In particular, Castellano et al. identify four types of strategy emerging as a result of finding the right balance: new venture; multi-localised; spill-over, and institutional strategy, all of which are detailed in the article. The authors emphasise that

understanding of these four strategies is particularly important for companies operating in changing, complex and uncertain environments.

An interesting point salient in this special issue is that no two clusters are the same, even when they are supported by the same 'top down' policy. To this respect, Bonnafous-Boucher et al. develop a typology enabling to investigate how policy-based French clusters are organised and operate. Their typology is based on the structure of the cluster, geographical concentration, existence of a local productive system, and internationalisation. Their analysis of 71 clusters reveals how new rules are being established via interactions between clusters and within a cluster itself. Another key finding in this article is that the need for knowledge, skills and capabilities development depends on the type of the cluster.

Racine and Hanin investigate further this question of skills in a cluster. Their article focuses on the features and dynamics of the skills ecosystem within the IT sector of Quebec region. In particular, they investigate the role of the government in the development of skills required in the cluster. The authors conducted a survey of 203 IT companies in Quebec, the results of which were used to map the different dimensions of the skills ecosystem. Racine and Hanin then evaluate the impact of recent policy and economic changes on the skills ecosystem: the ability of freelance workers to gain access to calls for tender, the increase in immigrant workers, the lack of a specific competency framework in the Quebec public sector.

Finally, taking a look at the impact of clusters on innovation, Mariotti and Salvador investigate the role played by science parks and incubators in the growth and development of research spin-offs. Based on a survey of 155 Italian research spin-offs, they find that on-park research spin-offs are not only usually smaller than off-park firms, but also are more oriented to deal in the international market. Moreover, on-park research spin-offs are less prone to develop patents compared to off-park ones. They conclude that on-park research spin-offs, therefore, can be potentially more innovative, but require high level of investment in equipment and laboratories in order to develop and grow – facilities that can be offered by science parks and incubators.

Hence, this special issue progresses our knowledge and understanding of clusters by emphasising that no two clusters are the same (Nowak), even when located within one relatively homogenous country and supported by the same policy (Bonnafous-Boucher et al.). Unsurprisingly, there is no 'one size fits all' policy enabling to successfully develop a cluster, which explains why so many attempts to replicate Silicon Valley by using the same 'recipe' have failed. It is thus critical to identify and understand the local specificities of each region to turn these specificities into assets (Nowak; Rosiello et al.). However, doing so is generally not straightforward and, besides developing fit-for-purpose policies, it is critical to involve relevant stakeholders in order to identify key entrepreneurial opportunities (Rosiello et al.). Furthermore, considering the companies' strategies in relation to the cluster is also becoming critical (Castellano et al.).

A further critical issue identified in this special issue relates to skills available in the cluster, not only those available to the companies in the cluster (Racine and Hanin), but also those available to the managers of the cluster (Coletti and Di Maria). Finally, it is important to adopt a broader overlook and to consider companies operating within and outside of the clusters (Mariotti and Salvador), as well as those firms that operate in mixed environments (both in and out) or across several clusters (Castellano et al.). This last point is particularly critical, as the success of clusters should not be considered in

isolation: clusters success is often the result of a symbiosis, not only with the outside environment, but also with other clusters (Bonnafous-Boucher et al.).

As a conclusion, this special issue shows that for clusters to be successful, they need to move away from the model of the Silicon Valley. It is probably by stopping to be 'cheap copies' that clusters and technoparks will become masterpieces and, thereby, be successful in their own right.