Introduction to the *Handbook of Research on Techno-Entrepreneurship*, Third Edition

Techno-entrepreneurship is defined as the entrepreneurial and intrapreneurial activities of both incumbent and nascent companies operating in a technology- or knowledge-intensive environment that encourages and fosters the development and introduction of technology-based and knowledge-intensive novel products, services, production methods, or business models (Thérin, 2009; 2014). It serves as an important conduit to firm growth, job and new industry creation, and economic development (Acs et al., 2016; Audretsch, 2007; Baumol, 2010; Carree and Thurik, 2003; Yoon et al., 2018). Despite its significant socio-economic and spillover effects across other constituents of the global economy, techno-entrepreneurship entails high risk and uncertainty that are mainly derived from the fast and dynamically changing nature of technology. Drawing on dynamic and broad views on the phenomenon, this handbook aims to deepen our understanding of techno-entrepreneurship by proposing novel theoretical frameworks, introducing emerging categories of techno-entrepreneurship, and exploring new patterns in entrepreneurial ecosystems and across different countries by using a variety of unique data sources.

First, current research is showing that new theoretical frameworks are needed in order to cope with the growing relevance of techno-entrepreneurship initiatives in different countries (Shan et al., 2018; Chaudhry et al., 2018; Judge et al., 2015; Yu et al., 2009; Venkataram, 2004; Phan and Der Foo, 2004; Baark, 1994). At the same time, we have relatively little understanding about emerging categories of entrepreneurship. Accordingly, we include a chapter dedicated to proposing new roles of technological embeddedness in techno-entrepreneurship, and explore relatively new categories of entrepreneurship that are closely related to reverse and frugal innovation, the drone industry, and gender-specific entrepreneurship.

Second, the scope of contemporary techno-entrepreneurial ventures is changing (Baporikar, 2017), the reason being twofold: on the one hand, it is shifting towards exploring and exploiting opportunities across national borders (Vasudeva, 2009; Baker et al., 2005); on the other hand, it is embodying a broader perspective in dealing with business environmental turbulences (Castrogiovanni, 1991; Li and Atuahene-Gima, 2001) and increasingly complex collaborative networks (Appio et al., 2017;

Sousa and Fontes, 2012; Antoncic and Prodan, 2008). The loci where techno-entrepreneurs find fertile ground are increasingly science parks (Xie et al., 2018), technology incubators (Khorsheed et al., 2014), and business ecosystems (Clarysse et al., 2014; Kapoor and Agarwal, 2017; Carayannis et al., 2018). At the level of global initiatives aiming at stimulating the development of competitive business ecosystems, it is worth mentioning the MIT REAP¹ (Regional Entrepreneurship Acceleration Program), which mainly consists of a series of mechanisms able to inform and support teams of regional leaders to co-create strategic interventions stimulating innovation-driven entrepreneurial (IDE) dynamics; more precisely, it eases interactions among entrepreneur, risk capital, corporate, government, and university implementing the principles of the quintuple helix (e.g., Carayannis et al., 2018; Gastaldi et al., 2015). Another interesting international project is provided by the Business Ecosystem for Tradition and Innovation² (TRINNO) initiative, involving multiple countries (Italy, Hungary, Ireland, Slovenia, and Spain) and approved within the Interreg Europe program financed by the European Regional Development Fund. The TRINNO initiative has the ambition of improving policy instruments for business support systems, and it focuses on the application of digital innovation (products and process) in regional economies, specifically in their traditional sectors. Another class of initiatives entails the creation of observatories in order to map the emergence and evolution of business clusters and understand how they affect the ecosystem of specific regions: the Cluster Observatory³ (a European initiative) and the US Cluster Mapping⁴ (a US initiative). Launched in 2007, but with a history that traces back to 2003, the European Cluster Observatory is an online, single access point to data and analyses of clusters, cluster organizations, and regional microeconomic framework conditions in Europe. It produces reports on clusters and regional competitiveness conditions and provides policy makers and academics with a tool for benchmarking, designing strategic economic roadmaps, and researching ecosystem dynamics. The American counterpart, the US Cluster Mapping, is a national economic initiative providing open data records on industry clusters and regional business environments in the US with the long-term aim of promoting economic growth and national competitiveness. The project leader is Harvard Business School's Institute for Strategy and Competitiveness in partnership with the US Department of Commerce and US Economic Development Administration. These two initiatives highlight the importance of linking cluster dynamics, business ecosystem development and growth, and policy making. An important gap they fill is that they allow for in-depth analyses at different levels: national, regional, metropolitan. The need to move towards finer-grained analyses at city level was highlighted in recent research (e.g., Appio et al., 2019;

Ma et al., 2018) where authors show how and to what extent smart cities epitomize business ecosystems and why strategic policy making is needed in order to wisely balance innovation (Abella et al., 2017), governance (Ruhlandt, 2018), information and communications technology (ICT) infrastructure (Kim et al., 2010; Quan and Sanderson, 2018), and quality of life (Ramaswami et al., 2016). In this context, the holistic view (Xu et al., 2018) is being increasingly preferred over reductionist analyses focusing on some specific pillars since it is the proper way to unveil ecosystem dynamics at play. By adopting this holistic stance, the chapters on entrepreneurial ecosystems deal with dynamic collaborations taking place in incubators, accelerators, the digital ICT industry, and the crowdfunding industry.

Third, higher education institutions are not only acting as producers of knowledge, but also as a catalyst for entrepreneurial activity and are at the heart of the academic entrepreneurship phenomenon (Etzkowitz et al., 2000). Use of academic and intellectual resources for entrepreneurial activities is justified when considering the ability of academics to be creative and to contribute to our knowledge society (Audretsch et al., 2014).

Lastly, techno-entrepreneurship is discussed through the lenses of some country-specific issues for Africa, Italy, and South Korea.

In sum, this edition includes 15 chapters, written by 37 contributors coming from 13 different countries. In line with this conceptual approach, the book has been divided into five parts, dealing respectively with:

- I. Conceptualization (Chapter 1)
- II. New categories of entrepreneurship (Chapters 2–5)
- III. Ecosystems (Chapters 6–9)
- IV. Academic entrepreneurship (Chapters 10 and 11)
- V. Country-specific entrepreneurship (Chapters 12–15).

NOTES

1. <http://reap.mit.edu/>.
2. <https://www.interregeurope.eu/trinno/>.
3. <http://www.clusterobservatory.eu/index.html>.
4. <http://www.clustermapping.us/>.

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