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Knowledge-Intensive Innovative Entrepreneurship

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Contents

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ABSTRACT

The interplay between innovation, knowledge and entrepreneurship constitutes a major driver of the economic, social and cultural development in modern societies and has major implications for public policy. To understand these broad trends, a novel literature on knowledge-intensive innovative entrepreneurship has recently emerged. In this book we provide a presentation of the key concepts, the relevant empirical findings and the main specific insights. We take a Schumpeterian, evolutionary and innovation system view of entrepreneurship, knowledge and innovation. In the conceptual framework proposed in this book, knowledge-intensive innovative entrepreneurs are involved in the creation, diffusion and use of knowledge; introduce new products and technologies; draw resources and ideas from the innovation system in which they operate; and introduce change and dynamism into the economy. This volume provides detailed insights into the progress made in defining and understanding

knowledge-intensive innovative entrepreneurship both theoretically and empirically; in discussing the current analytical understanding and empirical evidence; and in proposing the key directions and topics for future research.

Keywords: entrepreneurship; innovation; knowledge; innovation systems; evolutionary theory.

Part I

Introduction to KIE

1

Introduction

This volume examines knowledge-intensive innovative entrepreneurship, shortened as KIE. KIE firms are defined as new learning organizations that use and transform existing knowledge and generate new knowledge in order to innovate within innovation systems (Malerba and McKelvey, 2018a).

The emerging literature on KIE stresses the relevance of the knowledge-based economy, the central position of innovation in modern industries and services and the essential role of new firms in the economic growth of countries. Therefore, this volume puts forward the argument that KIE provides a modern view of entrepreneurship that links the intense use of knowledge by the new ventures with a high innovative activity related to the economy and markets.

1.1 Introducing KIE

Entrepreneurship as a domain of research is highly diverse and expanding, and one where leading scholars stress the need to continue developing underlying theories to better explain the phenomenon (Alvarez *et al.*, 2016; Carlsson *et al.*, 2013). Numerous articles and handbooks have attempted to define the wider field of entrepreneurship as a research field

as well as to characterize the phenomena and the appropriate lines of enquiry for future research (Bruyat and Julien, 2001; Carlsson *et al.*, 2013; Landström *et al.*, 2012; Shane, 2000; Shane and Venkataraman, 2000; Venkataraman *et al.*, 2012). Rather than surveying the very large literature on entrepreneurship in general or even entrepreneurship related to innovation and knowledge, this volume has a specific focus, namely a Schumpeterian inspired view on KIE. The overall view is presented at the end of this volume as a co-evolutionary process model of KIE.

In claiming that entrepreneurship drives economic development, Schumpeter (1934, 1942) focused our attention on how and why the activities of entrepreneurs create a disruptive, disequilibrium force in the economy, which in turn enables growth. More specifically, Schumpeter outlined the entrepreneurial function, whereby entrepreneurs play a key role in stimulating economic dynamism by using ideas and technical inventions, accessing finance and transforming those idea into technological, commercial and organisational innovations (Andersen, 2011; Kurz, 2012; Swedberg, 1991).

Researchers in the Schumpeterian tradition in entrepreneurship and small business economics have been involved in a number of relevant conceptual debates (Carlsson *et al.*, 2013; Landström *et al.*, 2012). These debates include whether opportunities are created or discovered (Alvarez *et al.*, 2013); whether entrepreneurs grasp existing opportunities or create new ones (Buenstorf, 2007; Shane, 2000); the extent to which new firms can challenge incumbents and transform the economic system by creating an entrepreneurial regime (Winter 1984; 2016); and the conditions stimulating entrepreneurial innovation (Acs and Autio, 2014; Autio *et al.*, 2014) and innovative entrepreneurship (Shane, 2009). Moreover, parts of the modern entrepreneurship literature recognize that knowledge – as gained through education, experience and so forth – affects how individual entrepreneurs are able to identify and react to opportunities (Aldrich and Yang, 2014; Alvarez and Barney, 2007; Ardichvili *et al.*, 2003; Shane, 2003). Therefore, the knowledge accumulated by the founders and teams within and across industries, as well as in scientific and research organizations, and in upstream or downstream activities, are vital for entrepreneurship survival and performance (Adams *et al.*, 2016; Agarwal and Shah, 2014; Klepper, 2016). Along these lines, the

emerging literature which has developed the empirical evidence and the conceptualization of KIE articulates the relationships between the entrepreneur (the person), the entrepreneurial firm (the organization), knowledge and the broader social and economic context (innovation system).

The existing conceptualization of KIE extends and integrates three theoretical building blocks constituted by Schumpeterian entrepreneurship, evolutionary economics and innovation systems. This perspective enables a conceptual understanding of both entrepreneurial and innovative processes, which are dependent upon different forms of knowledge in the economy. This emerging stream of literature on KIE includes a wide range of publication forms – from articles to books, as well as book chapters and working papers currently under review in journals. Because this emerging literature is rich and diverse, we have carefully chosen specific contributions and have grouped them into underlying themes. Rather than discussing all the work on entrepreneurship concerning knowledge and innovation, this volume presents selected and focused work on the topic of KIE.

The concept of KIE is also highly relevant for public policy which aims to stimulate knowledge, innovation and entrepreneurship. In recent decades, a community of researchers has been active in defining underlying concepts used by public policy. Early on, the focus was upon research and development (R&D), and its linkages to high-tech, medium-tech and low-tech industries, including the development of specific indicators and of arguments about the relative importance of high-tech industries in the economy (Hatzichronoglou, 1997). Later work continued the exploration of new indicators and understanding, by focusing upon different types of knowledge prevalent across the economy, such as low-tech industries, services and knowledge intensive activities (Eurostat, 2014). The OECD has been very active in promoting a view of the importance of knowledge in the economy, using a set of related concepts, e.g. knowledge economy, knowledge-based economy, learning economy, knowledge-intensive economy. The common denominators of these words are that they stress that the basis of competitiveness (and jobs) in the wider economy depends upon firms searching for, developing, and applying different types of knowledge in economic activities;

and that firms act within more holistic context such as innovation systems and entrepreneurial ecosystems. Thus, this volume on KIE is also highly relevant for public policy.

As previously mentioned, this volume examines the emerging stream of literature on KIE. This volume covers a range of topics in order both to take stock of the current state-of-art research as well as provide detailed insights, which will facilitate future research and public policy implications. This volume presents the relevant definitions, the theoretical conceptualization and the empirical indicators and discusses public policy and trajectories for future research. The literature reviewed in this volume frames the broader phenomenon of KIE as a process of learning and problem-solving aiming to benefit from opportunity identification, creation and exploitation and which is conditioned by the linkages and networks related to innovation systems and knowledge-intensive ecosystems.

1.2 Positioning KIE Through Three Starting Points

This volume is restricted to focusing upon KIE as a distinctive form of entrepreneurship. This concept complements and contains some elements of, but is also different from, other types of entrepreneurship which are already present in the entrepreneurship literature. The concept of KIE is based on three starting points.

The first starting point is that the analysis of KIE as presented in this volume focuses primarily upon economic aspects of entrepreneurs and entrepreneurship. This means that in this volume we do not examine the sociological aspects, in terms of cultural and social aspects, relationships within and across groups; status and background. Nor we will analyze the psychological traits of the entrepreneurs (as in the stream of literature inspired by McClelland, 1967). Finally the volume will not go in depth into the cognitive dimensions and biases of entrepreneurs (Camerer and Lovallo, 1999; Kahneman *et al.*, 1982; Mitchell *et al.*, 2002). The authors do recognize that sociological, cultural, psychological, and cognitive theories could be useful to further explain KIE in later research. However, the concept per se has been developed to understand entrepreneurship related to profits and economic gains in (primarily) a market economy.

The second starting point is that the emerging literature on KIE departs from a Schumpeterian tradition related to the importance of the entrepreneur and of innovations in the economy, and of the role of uncertainty and risk-taking. It brings in a specific view on how knowledge in general is linked to the experience and knowledge of founders and to the capabilities of entrepreneurial organizations. This starting point means that the KIE literature rejects the assertion – quite diffused in the economics discipline – that knowledge is just mere information. This widely held view of information per se has been prevalent in a wide range of contributions in economics, starting from the analysis by Hayek (1954) and exemplified in the major and extensive work by Machlup (1984). In these contributions, the analytical focus is on issues related to decision theory, the communication of information and the static allocation of a given set of resources. In this framework, the pricing system becomes the key mechanism for the communication of information. This view can be found also in some entrepreneurship research. For example, Kirzner's (1973) view is one in which entrepreneurs are characterized by superior knowledge (equal to information) that enables them to benefit from the ignorance of others.

In contrast, in a KIE perspective, knowledge is considered more than information: it includes the selection, interpretation, absorption and process of information (Cohen and Levinthal, 1990; Foray, 2004; Metcalfe, 2002) and hence is related to the experience and knowledge of founders and to the capabilities of entrepreneurial organizations. Moreover, knowledge can be characterized in many different dimensions (for example, declarative or procedural, codified or tacit, and so on), and may involve a wide variety of dimensions and processes (Nelson and Nelson, 2002). In this respect, KIE moves away from the view that considers entrepreneurs as dealing only with information, because this widely held view in economics ignores the complexity of knowledge, the role of capabilities and the innovation process.

In order to develop this second starting point a bit more, we need to add that the Schumpeterian and knowledge view of KIE implies an understanding of entrepreneurship which is rather opposite from the one of the Austrian school. The Austrian school – and Kirzner in particular – sees entrepreneurship as a stabilizing force that accelerates the

process of adjustment to equilibrium (Kirzner, 1973). In contrast, the Schumpeterian view considers entrepreneurship as a disequilibrium force that disrupts existing practices and introduces novelty and chance into the economic system, while a Kirznerian perspective views entrepreneurship in an opposite way, as a force that accelerates the process of adjustment to equilibrium (Kirzner, 1973). For Kirzner markets cannot work without entrepreneurs, who are alert to situations of opportunities when situations of disequilibrium are present. Profits are not the returns to innovation or to actions facing true uncertainty, but the reward of the alertness to opportunities by the entrepreneur. In entrepreneurship literature, the ontology of Kirzner vs Schumpeterian view of discovery vs creation has in particular been applied to the debate about whether opportunities are discovered or created (Alvarez *et al.*, 2013).

Hence, this Schumpeterian tradition places KIE in a theoretical perspective different from the traditional neoclassical view of entrepreneurship as an equilibrating process that wipes out temporary extra-profits in an industry. This also means that this positioning also places KIE in a different position even with respect to the most interesting recent attempts by the neoclassical tradition that aim to reconcile entrepreneurship and innovation (that is novelty and change) with incentives, competitive markets and equilibrium. To illustrate the differences, take as an example the recent sophisticated work by Baumol (2010), as further explained on page 11.

The strong Schumpeterian flavor means that the emerging literature on KIE sees entrepreneurship as a process of carrying out new combinations and of creative destruction related to innovation (Schumpeter, 1934). This also implies a broad view of innovation as related to "the new commodity, the new technology, the new source of supply, the new type of organization" (Schumpeter, 1942) and is linked to the extensive research done in innovation studies and economics of innovation. The Schumpeterian view of KIE also leads to the interpretation that the entrepreneur faces situations characterized by high uncertainty (as opposed to risk), as it has also been discussed extensively by Knight (1921) and (1942). For Knight, human behavior is inherently explorative and experimental, with economic activity facing uncertainty. This is particularly relevant for entrepreneurs, who bear major uncertainty when they mobilize resources and introduce novelty in the economic

system. When facing uncertainty, profits are the reward for this type of economic activity.

The third starting point is that this volume focuses upon knowledge-intensity. The Malerba and McKelvey (2018a) definition of KIE firms as new learning organizations that use and transform existing knowledge and generate new knowledge in order to innovate within innovation systems clearly positions and differentiates KIE from other types of entrepreneurship related in various ways either to knowledge or innovation. Many existing contributions about entrepreneurship do discuss certain aspects of knowledge, innovation, industrial structure and growth, and have been extremely useful for inspiration in several instances. However, these contributions cover only limited parts of the phenomena captured by KIE, as it is will be explained below in relation to the three concepts of knowledge, innovation and industrial structure/growth, respectively.

Many definitions within the entrepreneurship literature discuss knowledge as related to a particular type of technology or as originating from university research and education organizations. We acknowledge that there is an enormous literature on entrepreneurial firms in high-tech industries reliant upon advanced technology (for example, Acs *et al.*, 2009; Audretsch and Thurik, 2001c; OECD, 2005); new engineering-based firms (for example Autio, 1997, 2007); and new technology based firms (for example Colombo *et al.*, 2004; Colombo and Grilli, 2005). These definitions emphasize the distinctiveness of the new ventures in terms of advanced technology and R&D activities. We certainly acknowledge that advanced technologies and R&D are indeed relevant for understanding some groups of KIE ventures. Instead, the overall KIE definition includes high-tech industries and technology per se, but is broader in that it also includes services, traditional industries, manufacturing, creative industries as well as a broad set of knowledge areas including also design, creativity, experience, and science.

Another stream of literature focuses upon knowledge related to the university – through concepts such as commercialization, academic entrepreneurship, and the entrepreneurial university. Perkman *et al.* (2013) provides a thorough review of this literature and propose a distinction of two ways in which the university may affect society, where one type is commercialization through patents and start-up companies and another type is academic engagement with industry through

knowledge networks and relationships. Perkman *et al.* (2013) also differentiate the analysis at the level of individuals, organizations and institutions, in order to make propositions that while institutions and organizations appear most likely to be involved in commercialization, individuals are key for academic engagement with industry. Agarwal and Shah (2014) explain in great detail the characteristics and relevance of academic and scientific entrepreneurship per se. Academic engagement and academic entrepreneurship definitively are one type of KIE firms. However the overall KIE concept is broader than academic entrepreneurship in that it encompasses all that entrepreneurship that is knowledge-intensive and innovative, and not just the type that belongs to the academic sphere.

Another approach is the stream related to entrepreneurship as knowledge filter, as proposed by Acs *et al.* (2009) and Braunerhjelm *et al.* (2010). In that tradition, knowledge becomes a key factor enabling the entrepreneurial function, creating opportunities and leading to economic growth (Audretsch and Keilbach, 2007). The knowledge filter definition and that of KIE have in common the point that entrepreneurship plays a major role in the transmission and transformation of knowledge. However, they are not synonymous. KIE focuses upon the aspect of being innovative (i.e. introducing new products and processes in the economic system), while the definition associated with the knowledge filter is associated with knowledge spillovers and not necessarily focused upon innovation.

In terms of innovation as related to entrepreneurship, there are recent streams of literature that stress innovation per se. One example is the innovative entrepreneurship discussed within the neoclassical tradition which sees knowledge as information. For Baumol, innovative entrepreneurship represents that partner of the inventor who covers the steps between invention and final marketing. According to Baumol (2010) the presence of competitive markets leads to discriminatory pricing for innovative activity, which entails that entrepreneurs set prices that differ. But due to competitive markets and intertemporal price discrimination, innovative entrepreneurs as a group should expect negative economic profits. In this way Baumol (2010) is able to insert entrepreneurship into a theory based on incentives and equilibrium. This view, albeit sophisticated and consistent, is at odds with the view of KIE based

on disequilibrium and on profits which are generated by knowledge and innovation and not by different information. Another stream of literature concentrates on highly innovative new firms (Schneider and Veugelers, 2010), in which the focus is on new firms that present a high rate of innovation and that may overcome various obstacles to their innovative activity. However, highly innovative firms are only a subset of KIE. KIE may not necessarily be highly innovative and do not necessarily have high growth, rather, in addition to innovation, they are characterized by a high knowledge intensity in their activity.

In terms of industrial structure/growth related to entrepreneurship, the existing literature provides many insights that can be of relevance for an understanding of KIE. The literature on KIE is consistent with the view that a variety of factors affect the supply and the demand for entrepreneurship (Casson, 1982, and 2003). On the one hand, the supply of entrepreneurship can be related to the distribution of entrepreneurial ability in the population and to socio-economic conditions that affect entrepreneurship and the institutional framework of the economy. On the other hand, the demand for entrepreneurship is related to the pace of change and the level of opportunities in an economy (Audretsch and Thurik, 2001c; Storey, 1994). Similarly, industrial structure and technological context affect the rate of entrepreneurship in an economy, and networks and education are important to the development and diffusion of knowledge and innovation. Hence, much entrepreneurship literature may be relevant for an understanding of KIE at a general level.

An example of the way in which industrial structure/growth helps to generate knowledge which affects later entrepreneurship is seen in literature related to spinoffs (Agarwal *et al.*, 2004; Klepper, 2016) and to vertical new entrants coming from the upstream or downstream industries (Adams *et al.*, 2018). This view of new firms examined according to the knowledge content of the founder emphasizes the differences in the knowledge and experience that the founder has at the moment of founding the new firms. This indeed represents a subset of KIE firms. However KIE includes more that new firms with industry experience, be in the same industry or in the upstream or downstream industries. Hence, the stream of literature on spinoffs and

the pre-history of the founders does not explicitly address whether the new venture is highly knowledge intensive nor the fact whether the new venture is innovative or not. Nevertheless this literature helps identify important inputs to specific types of knowledge relevant to entrepreneurship, specifically where the founder has direct experience and knowledge of the activities taking place in the same industry of the start-up phase and/or in upstream or downstream industries.

Another group of contributions regarding entrepreneurship focuses upon growth of firms. There is a large literature on gazelles (Birch, 1979; Henrekson and Johansson, 2010), and on unicorns. Both of these concepts are defined in terms of high growth rates over a certain period. In this tradition, there is relevant work done on high growth entrepreneurial firms (Coad, 2009) which can also be applied to KIE firms. But the KIE literature does not propose that all KIE firm grow at such rapid rates. Hence, the measurement and reasons for different rates of growth is an empirical issue and can vary across KIE ventures; it is not a way of defining KIE firms.

In summary, the positioning of the emerging literature on KIE has been done relative to three starting points. The first starting point is that the analysis of KIE as presented in this volume focuses primarily upon economic aspects of entrepreneurs and entrepreneurship. The second starting point is that the emerging literature on KIE builds upon the Schumpeterian tradition of the importance of the entrepreneur and of innovations in the dynamics of the economy, and the role of knowledge in entrepreneurship. The third starting point is that this volume focuses upon the knowledge intensity of the innovative activity of KIE.

In this positioning relative to other literature, it is clear that there are many existing definitions of entrepreneurship related to either knowledge, innovation, growth or industrial structure, which may capture some sub-set of the phenomena related to KIE, but which also differ in important ways. In fact the conceptualization of KIE is broader than other highly focused definitions of start-us, such as new high-technology firms, academic entrepreneurship, unicorns and so forth. Moreover, KIE indicates a need to consider both knowledge-intensive and innovative firms: they can be found across all sectors, technologies, and industries.

It thereby includes services and traditional sectors and not just the academic spin-offs or firms in high-tech industries.

1.3 A Roadmap

Following this introduction, this volume is divided into three parts.

- Part II focuses upon theory, definitions, and measurements of KIE, and includes Sections 2 and 3.
- Part III focuses upon empirical evidence on KIE, and includes Sections 4 and 5.
- Part IV focuses upon a process model of KIE and on future research directions, and includes Section 6.

More specifically, Part II of this volume consists of Section 2 on the theoretical building blocks of KIE and Section 3 on research design for empirical work and measurements.

Section 2 on the theoretical building blocks starts with the Schumpeterian tradition that deals with the entrepreneur and innovation then discusses evolutionary economics that focusses on knowledge and co-evolution and finally examines the innovation systems approach which puts a lot of emphasis on the context. Then it discusses the integration of three building blocks for a theoretical definition of KIE.

In Section 3, the existing KIE literature on measurements and empirical data is examined. The emerging literature proposes an empirical definition and a way in which KIE can be measured and analyzed. KIE are defined as new firms that are innovative, have significant knowledge intensity in their activity, are embedded in innovation systems and exploit innovative opportunities in diverse evolving sectors and contexts (sub-section 3.1). There are many ways to translate these constructs into measurements and to carry out research. In sub-section 3.2, some basic measures and indicators of each characteristics of KIE are presented. This section contains a discussion of several issues related to data in surveys and case studies. These insights are useful for conducting research on many future topics.

Part III of this volume discusses analytical understanding of KIE in Section 4 as well as quantitative understanding and proposed taxonomies of KIE ventures in Section 5.

Section 4 on the qualitative understanding of KIE initially discusses the specificities of KIE entrepreneurial processes (sub-section 4.1) with both an analysis of the entrepreneurial process and its relation to collaborative research for science and technology. Then in sub-section 4.2, entrepreneurs and ventures are examined with respect to knowledge, innovation and systems, in terms of phases of development, search, innovative opportunities and networks. In sub-section 4.3, the discussion moves to review work on KIE in sectoral innovation systems and technologies, with particular attention to information technology and digitalization, renewal of existing industries and emerging technologies and industries.

Section 5 presents the quantitative evidence on KIE. It first examines the relevance of KIE within the population of new firms (sub-section 5.1), and then the role of knowledge and innovation systems with respect to the characteristics of KIE ventures, capabilities and performance (sub-section 5.2). The analysis then moves to KIE in relation to national innovation systems (sub-section 5.3), particularly European countries, China, India, Russia and Latin America. Finally, the section concludes with a discussion of KIE and sectoral innovation systems (sub-section 5.4). First differences across sectors are examined, then the focus moves to high-tech industries, low and medium tech industries and creative and digital industries, followed by the existing taxonomies of KIE ventures (sub-section 5.6).

Part IV of this volume discusses a process model and future research. This Section outlines a process model for KIE that brings together the theoretical and conceptual understanding, in ways of relevance for both public policy and future research (Section 6). Sub-section 6.1 presents the model. It consists of origin of the KIE venture; the role of knowledge, opportunities and market conditions in affecting learning in the whole entrepreneurial process; the linkages between the management and development of the new venture and the innovation systems, with two-way interactions with actors and institutions. Sub-section 6.2 highlights the most interesting directions and topics for future research.

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References

Acs, Z. and E. Autio (2014). "National Systems of Entrepreneurship: Measurements Issues and Policy Implications". *Research Policy*. 43(8): 476–494. URL: http://dx.doi.org/10.1016/j.respol.2013.08.016.

Acs, Z., P. Braunerhjelm, D. Audretsch, and B. Carlsson (2009). "The Knowledge Spillover Theory of Entrepreneurship". *Small Business Economics*. 32(1): 15–30.

Adams, P., R. Fontana, and F. Malerba (2016). "User-industry Spin-Outs: Downstream Knowledge as a Source of Entry and Survival". *Organization Science*. 27(1): 18–35. URL: http://dx.doi.org/10.1287/orsc.2015.1029.

Adams, P., R. Fontana, and F. Malerba (2018). "Vertical Spinouts: Linking Vertically Related Industries". *Industrial and Corporate Change*. Forthcoming.

AEGIS Research Project (2013). AEGIS stands for: Advancing Knowledge-Intensive Entrepreneurship and Innovation for Economic Growth and Social Well-being in Europe, Grant Agreement number 225134. Brussels: European Commission, DG Research.

Agarwal, R., R. E. April, F. Malerba, and M. B. Sarkar (2004). "Knowledge Transfer Through Inheritance: Spin-out Generation, Development and Survival". *The Academy of Management Journal*. 47(4): 501–522. URL: http://dx.doi.org/10.2307/20159599.

Agarwal, R. and S. Shah (2014). "Knowledge Sources of Entrepreneurship: Firm Formation by Academic, User And Employee Innovators". *Research Policy*. 43(7): 1109–1133. URL: http://dx.doi.org/10.1016/j.respol.2014.04.012.

Aldrich, H. and T. Yang (2014). "How Do Entrepreneurs Know What to Do? Learning and Organizing in New Ventures". *Journal of Evolutionary Economics*. 24(1): 59–82.

Alvarez, S., D. Audretsch, and A. Link (2016). "Advancing Our Understanding of Theory in Entrepreneurship". *Strategic Entrepreneurship Journal, Special Issue: Theories of Entrepreneurship*. 10(1): 3–4. URL: http://dx.doi.org/10.1002/sej.1216.

Alvarez, S. and J. Barney (2007). "The Entrepreneurial Theory of the Firm". *Journal of Management Studies*. 44(7): 1057–1063. URL: http://dx.doi.org/10.1111/j.1467-6486.2007.00721.x.

Alvarez, S. and J. Barney (2010). "Entrepreneurship and Epistemology: The Philosophical Underpinnings of The Study of Entrepreneurial Opportunities". *The Academy of Management Annals*. 4(1): 557–583. URL: http://dx.doi.org/10.1080/19416520.2010.495521.

Alvarez, S., J. Barney, and P. Anderson (2013). "Forming and Exploiting Opportunities: The Implications of Discovery and Creation Processes for Entrepreneurial and Organizational Research". *Organization Science*. 24(1): 301–317.

Alves, A. C., B. B. Fischer, N. S. Vonortas, and S. Queiroz (2018). "Configurations of Knowledge-Intensive Entrepreneurial Ecosystems: An Assessment of the State of São Paulo, Brazil". *Revista de Administração de Empresas*. URL: http://dx.doi.org/10.17648/egepe-2018-83378.

Andersen, E. (2011). *Joseph A. Schumpeter's Evolutionary Economics: A Theory of Social and Economic Evolution*. Basingstoke and New York: Palgrave Macmillan. ISBN: 978-1-4039-9627-5.

Antonelli, C., J. Krafft, and F. Quatraro (2010). "Recombinant Knowledge and Growth: The Case of ICTs". *Structural Change and Economic Dynamics*. 21(1): 50–69. URL: http://dx.doi.org/10.1016/j.strueco.2009.12.001.

Ardichvili, A., R. Cardozo, and S. Ray (2003). "A Theory of Entrepreneurial Opportunity Identification and Development". *Journal of Business Venturing*. 18(1): 105–123. URL: http://dx.doi.org/10.1016/S0883-9026(01)00068-4.

Audretsch, D. (1995). *Innovation and Industry Evolution*. Boston: MIT Press. ISBN: 9780262-011464.

Audretsch, D. and M. Keilbach (2007). "The Theory of Knowledge Spillover from Entrepreneurship". *Journal of Management Studies*. 44(7): 1242–1254. URL: http://dx.doi.org/10.1111/j.1467-6486.2007.00722.x.

Audretsch, D. and R. Thurik (2001c). "What's New about the New Economy? Sources of Growth in the Managed and Entrepreneurial Economies". *Industrial and Corporate Change*. 10(1): 267–315. URL: http://dx.doi.org/10.1093/icc/10.1.267.

Autio, E. (1997). "New, Technology-Based Firms in Innovation Networks Symplectic and Generative Impacts". *Research Policy*. 26(3): 263–281. URL: http://dx.doi.org/10.1016/S0048-7333(96)00906-7.

Autio, E. (2007). *Global Entrepreneurship Monitor: 2007 Global Report on High-Growth Entrepreneurship*. Babson College.

Autio, E., M. Kenney, P. Mustar, D. Siegel, and M. Wright (2014). "Entrepreneurial Innovation: The Importance of Context". *Research Policy*. 43(7): 1097–1108. URL: http://dx.doi.org/10.1016/j.respol.2014.01.015.

Baumol, W. J. (2010). *The Microtheory of Innovative Entrepreneurship*. Princeton University Press. ISBN: 9781400835225.

Becker, M. and T. Knudsen (2002). "Schumpeter 1911: Farsighted Visions of Economic Development". *American Journal of Economic and Sociology*. 61(2): 387–403. URL: http://dx.doi.org10.1111/1536-7150.00166.

Bender, G. and S. Laestadius (2005). "Non-Science Based Innovativeness: On Capabilities Relevant to Generate Profitable Novelty". *Perspectives on Economic Political and Social Integration*. 11(1): 123–170. URL: http://dx.doi.org/10.1177/0969776411403990.

Bergek, A., S. Jacobsson, B. Carlsson, S. Lindmark, and A. Rickne (2008). "Analyzing the Functional Dynamics of Technological Innovation Systems: A Scheme Analysis". *Research Policy*. 37(3): 407–429. URL: https://doi.org/10.1016/j.respol.2007.12.003.

Birch, D. (1979). *The Job Generation Process*. MIT Program on Neighborhood and Regional Change. MIT.

Borrás, S. and C. Edquist (2017). *Holistic Innovation Policy: Theoretical Foundations, Policy Problems and Instrument Choices*. Oxford University Press.

Boschma, R. and K. Frenken (2011). "Technological Relatedness and Regional Branching". In: *Beyond Territory: Dynamic Geographies of Knowledge Creation, Diffusion and Innovation*. Ed. by B. Harald, M. Feldman, and D. Kogler. Routledge. URL: http://dx.doi.org/10.1111/ecge.12001.

Boschma, R. and R. Martin (2010). *The Handbook of Evolutionary Economic Geography*. Cheltenham, UK: Edward Elgar Publishers. ISBN: 9781847204912.

Braunerhjelm, P., Z. Acs, D. Audretsch, and B. Carlsson (2010). "The Missing Link: Knowledge Diffusion and Entrepreneurship in Endogenous Growth". *Small Business Economics*. 43(2): 105–125. URL: https://doi.org/10.1007/s11187-009-9235-1.

Breschi, S., C. Lenzi, F. Malerba, and M. L. Mancusi (2014). "Knowledge-Intensive Entrepreneurship: Sectoral Patterns in a Sample of European high-tech Firms". *Technology Analysis and Strategic Management*. 26(7): 751–764. URL: http://dx.doi.org/10.1080/09537325.2014.886683.

Breschi, S., F. Malerba, and L. Orsenigo (2000). "Technological Regimes and Schumpeterian Patterns of Innovation". *The Economic Journal*. 110(463): 388–410. URL: http://dx.doi.org/10.1111/1468-0297.00530.

Breschi, S., M. L. Mancusi, and F. Malerba (2010). "Survival of Innovative Entrants in Knowledge-Based Sectors". In: *Knowledge-Intensive Entrepreneurship and Innovation Systems: Evidence from Europe*. Ed. by F. Malerba. London: Routledge. 136–153. URL: http://dx.doi.org/10.4324/9780203857403.

Brink, J. and M. McKelvey (2013). "Financing and Privatizing a Visionary Research Endeavor in Proteonomics: The Case of Prosci in Australia". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Edward Elgar Publishers, Cheltenham. 173–188. ISBN: 978 1 78100 549 1.

Broberg, O., A.-S. Axelsson, and G. Sjöblom (2013). "Entrepreneurial Exploitation of Creative Destruction and the Ambiguity of Knowledge in the Emerging Field of Digital Advertising". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 105–118. ISBN: 978 1 78100 549 1.

Bruyat, C. and P.-A. Julien (2001). "Defining the Field of Research in Entrepreneurship". *Journal of Business Venturing*. 16(2): 165–180. URL: https://doi.org/10.1016/S0883-9026(99)00043-9.

Bryant, P. (2014). "Imprinting by Design: The Microfoundations of Entrepreneurial Adaptation". *Entrepreneurship Theory and Practice*. 38(5): 1081–1102. URL: http://dx.doi.org/10.1111/j.1540-6520.2012.00529.x.

Buenstorf, G. (2007). "Creation and Pursuit of Entrepreneurial Opportunities: An Evolutionary Economics Perspective". *Small Business Economics*. 28(4): 323–337. URL: http://dx.doi.org/10.1007/s11187-006-9039-5.

Buenstorf, G. (2010). "Knowledge Bases Entrepreneurship and International Technology Transfer in The German Laser Industry". In: *Knowledge-Intensive Entrepreneurship and Innovation Systems: Evidence from Europe*. Ed. by F. Malerba. London: Routledge. 243–264. URL: http://dx.doi.org/10.4324/9780203857403.

Buenstorf, G. and D. Heinisch (2018). "Science and Industry Evolution: Evidence from The First 50 Years of the German Laser Industry". *Small Business Economics*. URL: http://dx.doi.org/10.1007/s11187-018-0032-6.

Caloghirou, Y. and A. Protogerou (2016). "The AEGIS Survey: A Quantitative Analysis of New Entrepreneurial Ventures in Europe". In: *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 95–120. ISBN: 978–1138025288.

Caloghirou, Y., A. Protogerou, and A. Tsakanikas (2016). "The AEGIS Survey: a Quantitative Analysis of New Entrepreneurial Ventures in Europe". In: *Dynamics of Knowledge Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 48–94. ISBN: 978-1138025288.

Camerani, R. and F. Malerba (2010). "Patterns of Technological Entry in Different Fields: An Analysis of Patent Data". In: *Knowledge-Intensive Entrepreneurship and Innovation Systems: Evidence from Europe*. Ed. by F. Malerba. London: Routledge. 103–135. URL: http://dx.doi.org/10.4324/9780203857403.

Camerani, R., N. Corrocher, and R. Fontana (2016). "Competing for Product Innovation in Knowledge Intensive Industries: The Case of the Digital Audio Player Industry". In: *Dynamics of Knowledge Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 289–324. ISBN: 978-1138025288.

Camerer, C. and D. Lovallo (1999). "Overconfidence and Excess Entry: An Experimental Approach". *American Economic Review*. 89(1): 306–318. URL: http://dx.doi.org/10.1257/aer.89.1.306.

Cantner, U. (2016). "Foundations of Economic Change – An Extended Schumpeterian Perspective". *Journal of Evolutionary Economics*. 26(4): 701–736. 10/1007/s00191-016-0479-z.

Cantner, U., M. Göthner, and R. K. Silbereisen (2016). "Schumpeter's Entrepreneur – a Rare Case?" *Journal of Evolutionary Economics*. 27(1): 187–214. URL: http://dx.doi.org/10.1007/s00191-016-0467-3.

Carlsson, B. (1995). *Technological Systems and Economic Performance: the Case of Factory Automation*. Dordrecht: Kluwer. ISBN: 978-94-011-0145-5.

Carlsson, B., P. Braunerhjelm, M. McKelvey, C. Olofsson, L. Persson, and H. Ylinenpää (2013). "The Evolving Domain of Entrepreneurship Research". *Small Business Economics*. 41: 913–930. URL: http://dx.doi.org/10.1007/s11187-013-9503-y.

Casson, M. (1982). *The Entrepreneur: An Economic Theory*. Barnes and Nobles Totowa. ISBN: 978–1858989105.

Casson, M. (2003). "Entrepreneurship, Business Culture and the Theory of the Firm". In: *Handbook of Entrepreneurship Research*. Ed. by Z. Acs and D. Audretsch. Boston, MA: Springer. 223–246. ISBN: 978-1-4419-1191-9.

Coad, A. (2009). "The Growth of Firms: A Survey of Theories and Evidence".

Cohen, W. M. and D. A. Levinthal (1989). "Innovation and Learning: The Two Faces of R & D". *The Economic Journal*. 99(397): 569–596. URL: http://dx.doi.org/10.2307/2233763.

Cohen, W. M. and D. A. Levinthal (1990). "Absorptive Capacity: A New Perspective on Learning and Innovation". *Administrative Science Quarterly*. 35(1): 128–152. URL: http://dx.doi.org/10.2307/2393553.

Colombo, M., M. Delmastro, and L. Grilli (2004). "Entrepreneurs' Human Capital and the Start-Up Size of New Technology-Based Firms". *International Journal of Industrial Organization*. 22(8-9): 1183–1211. URL: http://dx.doi.org/10.1016/j.ijndorg.2004.06.006.

Colombo, M. and L. Grilli (2005). "Founders' Human Capital and the Growth of New Technology-Based Firms: A Competence-Based View". *Research Policy*. 34(6): 795–816. URL: http://dx.doi.org/10.1016/j.respol.2005.03.010.

Cooke, P. and A. Piccaluga (2004). *Regional Economies as Knowledge Laboratories*. Cheltenham: Edward Elgar Publishing. ISBN: 978 1 84376 821 0.

Delmar, F. and K. Wennberg (2010). *Knowledge Intensive Entrepreneurship: The Birth, Growth and Demise of Entrepreneurial Firms*. Edward Elgar. ISBN: 978–1848449909.

Dosi, G. (1988). "Sources, Procedures and Microeconomic Effects of Innovation". *Journal of Economic Literature*. 26(3): 1120–1171.

Dosi, G. and R. Nelson (2011). "Technical Change and Industrial Dynamics as Evolutionary Processes". In: *Handbook of the Economics of Innovation*. Ed. by B. Hall and N. Rosenberg. Elsevier, North-Holland. 51–127. URL: https://doi.org/10.1016/S0169-7218(10)01003-8.

Dosi, G., R. Nelson, and S. Winter (2002). "The Nature and Dynamics of Organizational Capabilities". In: *The Nature and Dynamics of Organizational Capabilities*. Ed. by G. Dosi, R. Nelson, and S. Winter. Oxford University Press.

Edler, J. and J. Fagerberg (2017). "Innovation Policy: What, Why and How". *Oxford Review of Economic Policy*. 33(1): 2–23. URL: https://doi.org/10.1093/oxrep/grx001.

Edquist, C. (1997). *Systems of Innovation: Technologies, Institutions and Organizations*. London: Pinter Publishers/Cassell Academic. ISBN: 9781855674523.

Edquist, C. and M. McKelvey (2000). *Systems of Innovation: Growth, Competitiveness and Employment*. Cheltenham: Edward Elgar Publishers. ISBN: 978 1 85898 573 2.

European Commission (2013). Research and Innovation Performance in EU Member States and Associated Countries: Innovation Union Progress at Country Level. Brussels, Belgium: RTD Publications. URL: http://dx.doi.org/10.2777/82363.

Eurostat (2014). "Eurostat Indicators of High-Tech Industry and Knowledge Intensive Services, Eurostat Metadata". URL: http://ec.europa.eu/eurostat/cache/metadata/FR/htec%5C_esms.htm.

Fagerberg, J. (2003). "Schumpeter and the Revival of Evolutionary Economics: An Appraisal of the Literature". *Journal of Evolutionary Economics*. 13(2): 125–159. URL: http://dx.doi.org/10.1007/s00191-003-0144-1.

Federico, J., H. Kantis, A. Rialp, and J. Rialp (2009). "Does Entrepreneurs' Human and Relational Capital Affect Early Internationalization? A Cross-Regional Comparison". *European Journal of International Management*. 3(2): 199–215. URL: https://doi.org/10.1504/EJIM.2009.024322.

Ferreira, V. and M. M. Godinho (2016). "The Determinants of Innovation: a Patent and Trademark-Based Analysis for the EU Regions". In: *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 369–390. ISBN: 978-1138025288.

Fischer, B. B., S. Queiroz, and N. S. Vonortas (2017). "On the Location of Knowledge-Intensive Entrepreneurship in Developing Countries: Lessons from São Paulo, Brazil". *Entrepreneurship & Regional Development*. 30(5–6): 612–638. URL: https://doi.org/10.1080/08985626.2018.1438523.

Fischer, B. B., P. R. Schaeffer, N. S. Vonortas, and S. Queiroz (2018). "Quality Comes First: University-Industry Collaboration as a Source of Academic Entrepreneurship in a Developing Country". *Journal of Technology Transfer*. 43(2): 263–284. URL: https://doi.org/10.1007/s10961-017-9568-x.

Fontana, R., F. Malerba, and A. Marinoni (2016). "Knowledge-Intensive Entrepreneurship in Different Sectoral Systems: A Taxonomy". In: *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 191–213. ISBN: 978-1138025288.

Foray, D. (2004). *Economics of Knowledge*. MIT Press. ISBN: 9780262062398.

Freeman, C. (1987). *Technology Policy and Economic Performance: Lessons from Japan*. London: Pinter Publishers. ISBN: 978–0861879281.

Garud, R. and P. Karnøe (2001). "Path Creation as a Process of Mindful Deviation". In: *Path Dependence and Creation*. Ed. by R. Garud and P. Karnøe. Psychology Press, Taylor & Francis Group. ISBN: 978–0415650717.

Gifford, E., G. Buenstorf, D. Ljungberg, M. McKelvey, and O. Zaring (2018). "The Role of Founder Knowledge in the Survival and Growth of Knowledge-Intensive Innovative Ventures". *Presented at the 17th ISS (International Schumpeter Society) 2018 Conference*. Seoul, South Korea.

Gifford, E., D. Ljungberg, and M. McKelvey (2019). "Innovating in Knowledge Intensive Entrepreneurial Firms: How the search for external knowledge affects their innovative performance in terms of goods and service innovations". Working paper at Institute of Innovation and Entrepreneurship, University of Gothenburg, Sweden.

Godin, B. (2006). "The Knowledge-Based Economy: Conceptual Framework or Buzzword?" *Journal of Technology Transfer*. 31(1): 17–30. URL: https://doi.org/10.1007/s10961-005-5010-x.

Göthner, M., M. Obschonka, R. Silbereisen, and U. Cantner (2012). "Scientists' Transition to Academic Entrepreneurship: Economic and Psychological Determinants". *Journal of Economic Psychology*. 33(3): 628–641. URL: http://dx.doi.org/10.1016/j.joep.2011.12.002.

Hatzichronoglou, T. (1997). *Revision of the High-Technology Sector and Product Classification. OECD Science, Technology and Industry Working Papers No. 02*. Paris: OECD Publishing. URL: http://dx.doi.org/10.1787/134337307632.

Hayek, F. A. (1954). "Capitalism and the Historians". ISBN: 978-0226320724.

Hébert, R. F. and A. N. Link (1989). "In Search of the Meaning of Entrepreneurship". *Small Business Economics*. 1(1): 39–49. URL: http://dx.doi.org/10.1007/BF00389915.

Henning, M. and M. McKelvey (2018). "Knowledge, Entrepreneurship and Regional Transformation: Contributing to the Schumpeterian and evolutionary perspectives on the relationships between them". *Small Business Economics*. URL: http://dx.doi.org/10.1007/s11187-018-0030-8.

Henrekson, M. and D. Johansson (2010). "Gazelles as Job Creators: A Survey and Interpretation of the Evidence". *Small Business Economics*. 35(2): 227–244. URL: http://dx.doi.org/10.1007/s11187-009-9172-z.

Hermansson, I., M. McKelvey, and O. Zaring (2018). "The evolution and embeddedness of knowledge-intensive entrepreneurial firms in creative industries: contrasting experienced and non-experienced entrepreneurs in the Swedish fashion industry". *European Planning Studies*. 26(12): 2387–2406. URL: https://www.tandfonline.com/doi/full/10.1080/09654313.2018.1535575.

Hirsch-Kreinsen, H. and I. Schwinge (2014). *Knowledge-Intensive Entrepreneurship in Low-Tech Industries*. Edward Elgar Publishing. ISBN: 978 1 78347 203 1.

Hirsch-Kreinsen, H. and I. Schwinge (2016). "Knowledge-Intensive Entrepreneurship in Low-Technology Industries". In: *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 214–238. ISBN: 978-1138025288.

Hodges, N. and A. Link (2018). *Knowledge-Intensive Entrepreneurship: An Analysis of the European Textile and Apparel Industries*. Springer. ISBN: 978-3-319-68777-3.

Hodgson, G. (2015). *Conceptualizing Capitalism: Institutions, Evolution and Future*. Chicago and London: The University of Chicago Press. ISBN: 9780226168005.

Holmén, M., M. Magnusson, and M. McKelvey (2007). "What Are Innovative Opportunities?" *Industry and Innovation*. 14(1): 27–45. URL: http://dx.doi.org/10.1080/13662710601130830.

Holmén, M. and M. McKelvey (2013). "Restless Capitalism and the Economizing Entrepreneur". *Economics of Innovation and New Technology*. 22(7): 684–701. URL: http://dx.doi.org/10.1080/10438599.2013.795780.

Jin, J. and G. Cheng (2015). "The Customer's Role in the Development of China's E-Bike Company: Forward or Backward Linkages". In: *Innovation Spaces: in Asia: Entrepreneurs, Multinational Enterprises and Policy*. Ed. by M. McKelvey and S. Bagchi-Sen. Cheltenham, UK: Edward Elgar Publishing. 87–103. ISBN: 978-1783475674.

Jin, J., Z. Zhang, and M. McKelvey (2015). "The Emergence of Knowledge Intensive Entrepreneurship in China: Four Science-Oriented Nanotech Start-Ups in Suzhou". In: *Innovation Spaces: in Asia: Entrepreneurs, Multinational Enterprises and Policy*. Ed. by M. McKelvey and S. Bagchi-Sen. Cheltenham, UK: Edward Elgar Publishing. 144–166. ISBN: 978-1783475674.

Kahneman, D., P. Slovic, and A. Tversky (1982). *Judgment Under Uncertainty: Heuristics and Biases*. Cambridge University Press. 978–0521284141.

Kantis, H., J. Federico, and S. Garcia (2014). *Systemic Conditions for the Creation of Dynamic Firms in Emerging Countries*. Dublin.

KEINS Research Project (n.d.). *Knowledge Base Entrepreneurship: Institutions, Networks and Systems, EU project n.CT2-CT-2004-506022, supported by European DG Research*.

Kirzner, I. M. (1973). *Competition and Entrepreneurship*. Chicago: Chicago University Press. ISBN: 978–0226437767.

Kirzner, I. M. (1997). "Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach". *Journal of Economic Literature*. 35(1): 60–85.

Klepper, S. (1997). "Industry Life Cycles". *Industrial and Corporate Change*. 6(1): 145–182. URL: https://doi.org/10.1093/icc/6.1.145.

Klepper, S. (2009). "Spinoffs: A Review and Synthesis". *European Management Review*. 6(3): 159–171. URL: http://dx.doi.org/10.1057/emr.2009.18.

Klepper, S. (2016). *Experimental Capitalism*. Princeton: Princeton University Press.

Knight, F. (1921). *Risk, Uncertainty and Profits*. Boston: Hoghton Mifflin. ISBN: 978–0984061426.

Knight, F. (1942). "Profit and Entrepreneurial Functions". *The Journal of Economic History*. 2(S1): 126–132. URL: https://doi.org/10.1017/S0022050700083479.

Krafft, J., F. Quatraro, and P. P. Saviotti (2014). "The Dynamics of Knowledge-Intensive Sectors' Knowledge Base: Evidence from Biotechnology and Telecommunications". *Industry and Innovation*. 21(3): 215–242. URL: http://dx.doi.org/10.1080/13662716.2014.919762.

Kurz, H. (2012). "Schumpeter's New Combinations: Revisiting his *Theorie der wirtschaftlichen Entwicklung* on the Occasion of its Centenary". *Journal of Evolutionary Economics*. 22(5): 871–899. URL: http://dx.doi.org/10.1007/s00191-012-0295-z.

Laage-Hellman, J. (2013). "Building of Collaborative Network Relationships: The Case of a Corporate Spin-Off in The Medical Technology Industry". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 146–158. ISBN: 978 1 78100 549 1.

Laage-Hellman, J. and M. McKelvey (2016). "The Influence of Networks and Sector Conditions for Managing a KIE Venture: A Case Study of Aerocrine in the Swedish Medical Technology Industry". In: *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 265–288.

Lachmann, L. (1986). *The Market as an Economic Process*. Oxford, UK: Basil Blackwell. ISBN: 978–0631148715.

Landström, H., G. Harirchi, and F. Åström (2012). "Entrepreneurship: Exploring the Knowledge Base". *Research Policy*. 41(7): 1154–1181. URL: http://dx.doi.org/10.1016/j.respol.2012.03.009.

Lassen, A. (2013a). "How Tensions Between Exploration and Exploitation Drives the Development Process of KIE: The Case of Sensor Inc." In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 21–33. ISBN: 978 1 78100 549 1.

Lassen, A. (2013b). "The Nexus Between Technology, Organizational, and Market Development: The case of NanoSpace Inc." In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Edward Elgar Publishers. 75–90. ISBN: 978 1 78100 549 1.

Lassen, A. (2019). "Indigenous Chinese Innovation and the Influence of Global Markets". In: *Innovative Capabilities and the Globalization of Chinese Firms: Becoming a Leader in Innovation Spaces*. Ed. by M. McKelvey and J. Jun. Cheltenham, UK: Edward Elgar Publishing.

Lassen, A., D. Ljungberg, and M. McKelvey (2018a). *Digital Disruptors: On the Potentials and Characteristics of Digital Knowledge Intensive Ventures*. Presented at the XXIX ISPIM Innovation Conference, 17–20 June 2018. Sweden: Stockholm.

Lassen, A., D. Ljungberg, and M. McKelvey (2018b). "Knowledge Intensive Entrepreneurship in Manufacturing and Creative Industries: Same, Same but Different". *Creativity and Innovation Management*. 27(3): 284–294. URL: http://dx.doi.org/10.1111/caim.12292.

Lassen, A. and D. Slepniov (2015). "Manoeuvring Global Innovation Spaces: An Explorative Case Study of a South Korean Entrepreneurial Venture in Nanotechnology". In: *Innovation Spaces: in Asia: Entrepreneurs, Multinational Enterprises and Policy*. Ed. by M. McKelvey and S. Bagchi-Sen. Cheltenham, UK: Edward Elgar Publishing. 124–134. ISBN: 978-1783475674.

Lee, K. and F. Malerba (2017). "Catch-up Cycles and Changes in Industrial Leadership: Windows of Opportunity and Responses of Firms and Countries in the Evolution of Sectoral Systems". *Research Policy*. 42(1): 338–351. URL: http://dx.doi.org/10.1016/j.respol.2016.09.006.

Lenzi, C., K. Bishop, S. Breschi, G. Buenstorf, P. Llerena, F. Malerba, M. L. Mancusi, and M. McKelvey (2010). "New Innovators and Knowledge-Intensive Entrepreneurship in European Sectoral systems: a field analysis". In: *Knowledge-Intensive Entrepreneurship and Innovation Systems – Evidence from Europe*. Ed. by F. Malerba. London: Routledge. 179–197. URL: http://dx.doi.org/10.4324/9780203857403.

Loasby, B. (1999). *Knowledge, Institutions and Evolution in Economics: The Graz Schumpeter Lectures*. London: Routledge. ISBN: 978–041529-8100.

Lumpkin, G. T. and G. Dess (1996). "Clarifying the Entrepreneurial Orientation Construct and Linking it to Performance". *Academy of Management Review*. 21(1): 135–172. URL: http://dx.doi.org/10.2307/258632.

Lundvall, B.-Å. (1993). "National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning". London. URL: https://doi.org/10.1080/08109029308629360.

Lundvall, B.-Å. (2007). "National Innovation Systems-Analytical Concept and Development tool". *Industry and Innovation*. 14(1): 95–119. URL: http://dx.doi.org/10.1080/13662710601130863.

Lundvall, B.-Å. (2017). *The Learning Economy and the Economics of Hope*. Anthem Press. ISBN: 9781783085965.

Machlup, F. (1984). *Knowledge. Its Creation, Distribution and Economic Significance: Vol. III. The Economics of Information and Human Capital*. Princeton University Press. ISBN: 978–0691640495.

Malerba, F. (1992). "Learning and Incremental Technical Change". *The Economic Journal*. 102(413): 845–859. URL: http://dx.doi.org/10.2307/2234581.

Malerba, F. (2002). "Sectoral Systems of Innovation and Production". *Research Policy*. 31(2): 247–264. URL: http://dx.doi.org/10.1016/S0048-7333.

Malerba, F. (2004). *Sectoral Systems of Innovation*. Cambridge: Cambridge University Press. ISBN: 9780521833219.

Malerba, F. (2010a). *Knowledge-Intensive Entrepreneurship and Innovation Systems: Evidence from Europe*. New York: Abington. URL: http://dx.doi.org/10.4324/9780203857403.

Malerba, F. (2018). "Sectoral Systems: Taxonomies, Evolution and Modeling". In: *Innovation Systems, Policy and Management*. Ed. by J. Niosi. Cambridge: Cambridge University Press.

Malerba, F., Y. Caloghirou, M. McKelvey, and S. Radosevic (2016). *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. London: Routledge. ISBN: 978–1138025288.

Malerba, F. and S. Mani (2009). *Sectoral Systems of Innovation and Production in Developing Countries*. Cheltenham: Edward Elgar. ISBN: 978 1 84844 656 4.

Malerba, F., S. Mani, and P. Adams (2017). *The Rise to Market Leadership. New Leading Firms from Emerging Countries*. Edward Elgar Celthenham. ISBN: 978 1 78347 678 7.

Malerba, F., S. Mani, V. Sterzi, X. Wu, and A. Yudanov (2016b). "The Growth of Knowledge Intensive Entrepreneurship in China, India and Russia: Quantitative Analysis and General Overview". In: *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 391–424. ISBN: 978-1138025288.

Malerba, F. and M. McKelvey (2016). "Conceptualizing Knowledge Intensive Entrepreneurship: Definition and Model". In: *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. Routledge. 19–47. ISBN: 978-1138025288.

Malerba, F. and M. McKelvey (2018a). "Knowledge-intensive Innovative Entrepreneurship: Integrating Schumpeter, evolutionary economics, and innovation systems". *Small Business Economics*. URL: http://dx.doi.org/10.1007/s11187-018-0060-2.

Malerba, F. and M. McKelvey (2018b). "Knowledge Intensive Entrepreneurship and Future Research Directions". In: *Innovation Management, Systems and Policy*. Ed. by J. Niosi. Cambridge University Press.

Malerba, F., R. Nelson, L. Orsenigo, and S. Winter (2016a). *Innovation and the Evolution of Industries*. Cambridge: Cambridge University Press.

Malerba, F. and L. Orsenigo (1997). "Technological Regimes and Sectoral Patterns of Innovative Actvities". *Industrial and Corporate Change*. 6(1): 83–118. URL: http://dx.doi.org/10.1093/icc/6.1.83.

Malerba, F. and N. Vonortas (2011). *Innovation Networks in Industries*. Cheltenham, UK: Edward Elgar Publishing.

Mamede, R., D. Mota, and M. M. Godinho (2010). "Are the Dynamics of Knowledge-Based Industries Different?" In: *Knowledge-Intensive Entrepreneurship and Innovation Systems: Evidence from Europe*. Ed. by F. Malerba. London: Routledge. 265–284. URL: http://dx.doi.org/10.4324/9780203857403.

McClelland, D. C. (1967). *Achieving Society*. Simon and Schuster. ISBN: 978–1891396397.

McKelvey, M. (1996). *Evolutionary Innovations: The Business of Biotechnology*. Oxford University Press. ISBN: 978–0613921565.

McKelvey, M. (1998). "Evolutionary Innovations: Learning, Entrepreneurship and the Dynamics of the Firm". *Journal of Evolutionary Economics*. 8(2): 157–175. URL: http://dx.doi.org/10.1007/s001910050.

McKelvey, M. and S. Bagchi-Sen (2015). *Innovation Spaces: in Asia: Entrepreneurs, Multinational Enterprises and Policy*. Cheltenham, UK: Edward Elgar Publishing. ISBN: 978–1783475674.

McKelvey, M. and J. Jun (2019). *Innovative Capabilities and the Globalization of Chinese Firms: Becoming a Leader in Innovation Spaces*. Cheltenham, U.K: Edward Elgar Publishing. ISBN: 978 1 78643 447 0.

McKelvey, M. and A. Lassen (2013a). *Managing Knowledge Intensive Entrepreneurship*. Cheltenham: Edward Elgar Publishers. ISBN: 978 1 78100 551 4.

McKelvey, M. and A. Lassen (2013b). *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Cheltenham: Edward Elgar Publishers. ISBN: 978 1 78100 549 1.

McKelvey, M. and A. Lassen (2018). "Knowledge, Meaning and Identity: Key Characteristics of Entrepreneurship in Creative and Cultural Industries". *Creativity and Innovation Management*. 27(3): 281–283. URL: https://doi.org/10.1111/caim.12293.

McKelvey, M., D. Ljungberg, and J. Laage-Hellman (2013b). "Collaborative Research in Innovative Food: An Example of Renewing a Traditional Low-Tech Sector Industry". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 159–172. ISBN: 978 1 78100 549 1.

McKelvey, M., D. Ljungberg, and A. Lassen (2016a). "Structuring the Process of Knowledge Intensive Entrepreneurship: Empirical Evidence and Descriptive Insights from Eighty-six AEGIS Case Studies". In: *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. Maureen, and S. Radosevic. London: Routledge. 142–169. ISBN: 978-1138025288.

McKelvey, M., D. Ljungberg, and A. Lassen (2016b). "A Meta-analysis of Opportunities in Eighty-six AEGIS Case studies of Knowledge Intensive Entrepreneurship". In: *Dynamics of Knowledge-Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 170–188. ISBN: 978-1138025288.

McKelvey, M., D. Ljungberg, O. Zaring, J. Laage-Hellman, and S. Stefan (2013a). "Collaborative Strategies: How and Why Academic Spin-offs Interact with Engineering University Center". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 34–47. ISBN: 978 1 78100 549 1.

McKelvey, M., O. Zaring, and S. Szücs (2019). "Evolutionary Governance Routines: Governance of technology and knowledge intensive entrepreneurship". *Journal of Evolutionary Economics*. URL: http://dx.doi.org/10.1007/s11187-018-0060-2.

Metcalfe, J. S. (1998). *Evolutionary Economics and Creative Destruction*. Abingdon, UK: Routledge. ISBN: 978-0415406482.

Metcalfe, J. S. (2001). "Institutions and progress". *Industrial and Corporate Change*. 10(3): 561–586. URL: http://dx.doi.org/10.1093/icc/10.3.561.

Metcalfe, J. S. (2002). "Knowledge of Growth and the Growth of Knowledge". *Journal of Evolutionary Economics*. 12(1–2): 3–15. URL: http://dx.doi.org/10.1007/s00191-002-0107.

Metcalfe, J. S. (2003). "The Entrepreneur and the Style of Modern Economics". *Journal of Evolutionary Economics*. 14(2): 15–75. URL: http://dx.doi.org/10.1007/0-387-25987-2%5C_3.

Metcalfe, J. S. (2014). "Capitalism and Evolution". *Journal of Evolutionary Economics*. 24(1): 11–34. URL: http://dx.doi.org/10.1007/s00191-013-0307-7.

Miles, I. (2005). "Knowledge Intensive Business Services: Prospects and Policies". *Foresight*. 7(6): 39–63. URL: https://doi.org/10.1108/14636680510630939.

Mitchell, R., J. B. Smith, E. A. Morse, K. W. Seawright, A. M. Peredo, and B. McKenzie (2002). "Are Entrepreneurial Cognitions Universal? Assessing Entrepreneurial Cognitions Across Cultures". *Entrepreneurship Theory and Practice*. 26(4): 9–32. URL: https://doi.org/10.1177/104225870202600402.

Mowery, D. and R. Nelson (1999). *Sources of Industrial Leadership: Studies of Seven Industries*. Cambridge University Press. ISBN: 978-0521645201.

Murmann, J. P. (2003). *Knowledge and Competitive Advantage: The Coevolution of Firms, Technology, and National Institutions*. Cambridge University Press. ISBN: 978-0521684156.

Murmann, J. P. (2013). "The Coevolution of Industries and Important Features of their Environments". *Organization Science*. 24(1): 58–78. URL: https://doi.org/10.1287/orsc.1110.0718.

Nefke, F., M. Hartog, R. Boschma, and M. Henning (2018). "Agents of Structural Change: The Role of Firms and Entrepreneurs in Regional Diversification". *Economic Geography*. 94(1): 23–48. URL: https://doi.org/10.1080/00130095.2017.1391691.

Nelson, R. R. (1959). "The Simple Economics of Basic Scientific Research". *Journal of Political Economy*. 67(3): 297–306. URL: http://dx.doi.org/10.1086/258177.

Nelson, R. R. (1993). *National Innovation Systems: A Comparative Study*. Oxford University Press. ISBN: 978-0195076172. URL: https://doi.org/10.1080/00130095.2017.1391691.

Nelson, R. R. (1994). "The Coevolution of Technology and Institutions". *Industrial and Corporate Change*. 3(1): 47–63. URL: http://dx.doi.org/10.1093/icc/3.1.47.

Nelson, R. R. (2011). "Economic Development as an Evolutionary Process". *Innovation and Development*. 1(1): 39–49. URL: http://dx.doi.org/10.1080/2157930X.2010.55105.

Nelson, R. R. (2016). "Behavior and Cognition of Economic Actors in Evolutionary Economics". *Journal of Evolutionary Economics*. 26(4): 702–737. URL: http://dx.doi.org/10.1007/s00191-015-0431-7.

Nelson, R. R. and K. Nelson (2002). "On the evolution of human know-how". *Research Policy*. 31(5): 719–33. July.

Nelson, R. R. and S. Winter (1982). *An Evolutionary Theory of Economic Change*. Cambridge: The Belknap Press of Harvard University Press. ISBN: 978–0674272286.

Nelson, R. R. and S. Winter (2002). "Evolutionary Theorizing in Economics". *The Journal of Economic Perspectives*. 16(2): 23–46. URL: http://dx.doi.org/10.1257/0895330027247.

OECD (1994). "The Measurement and Scientific and Technical Activities: Proposed Standard Practice for Surveys of Research and Experimental Development-Frascati Manual 1993". In: *The Measurement of Scientific and Technological Activities*. Paris: OECD Publishing. URL: http://dx.doi.org/10.1787/9789264063525-en.

OECD (1996). *The Knowledge Based Economy, General Distribution OECD/GD*. Paris: OECD Publishing.

OECD (2002). "Frascati Manual 2002: Proposed Standard Practice for Surveys on Research and Experimental Development". In: *The Measurement of Scientific and Technological Activities*. Paris: OECD Publishing. URL: http://dx.doi.org/10.1787/9789264199040-en.

OECD (2003). *Science, Technology, and Industry Scoreboard 2003 – Towards Knowledge-Based Economy*. Paris: OECD Publishing.

OECD (2005). *Oslo-Manual: Proposed Guidelines for Collecting and Interpreting Technological Innovation Data*. 3rd edition. Paris: OECD Publishing.

OECD (2013). *Science, Technology and Industry Scoreboard: Innovation for Growth*. Paris: OECD Publishing. URL: http://dx.doi.org/10.1787/20725345.

Østergaard, C. R. and E. Park (2013). "Knowledge Intensive Entrepreneurship from Firm Exit in a High-Tech Cluster: The Case of the Wireless Communications Cluster in Aalborg, Denmark". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 91–104. ISBN: 978 1 78100 549.

Pavitt, K. (1984). "Sectoral Patterns of Technical Change: Towards a Taxonomy and a Theory". *Research Policy*. 13(6): 343–337.

Perkman, M., V. Tartari, M. McKelvey, and E. Auto (2013). "Academic engagement and commercialization: a review of the literature on university-industry relations". *Research Policy*. 42(2): 423–442. URL: https://doi.org/10.1016/j.respol.2012.09.007.

Polanyi, M. (1966). "The Logic of Tacit Inference". *Philosophy*. 41(155): 1–18. URL: http://dx.doi.org/10.1017/S0031819100066110.

Protogerou, A. and Y. Caloghirou (2016). "Dynamic Capabilities in Young Knowledge-Intensive Firms: An Empirical Approach". In: *Dynamics of Knowledge Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 239–264. ISBN: 978-1138025288.

Protogerou, A., Y. Caloghirou, and N. Vonortas (2017). "Determinants of Young Firms' Innovative Performance: Empirical Evidence from Europe". *Research Policy*. 46(7): 1312–1326. URL: http://dx.doi.org/10.1016/j.respol.2017.05.011.

Protogerou, A., A. Kontolaimou, and Y. Caloghirou (2017a). "Innovation in the European Creative Industries: A Firm-level Empirical Approach". *Industry and Innovation*. 24(6): 587–612. URL: http://dx.doi.org/10.1080/13662716.2016.1263551.

Radosevic, S. and E. Yoruk (2016). "Entrepreneurial Orientation of Knowledge-based Enterprises in Central and East Europe". In: *Dynamics of Knowledge Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. Abingdon: Routledge. 327–368. ISBN: 978-1138025288.

Radosevic, S., E. Yoruk, and R. Woodward (2011). "Knowledge Intensive Entrepreneurship in Central and Eastern Europe: Results of a Firm Level Survey". In: *Knowledge-Intensive Entrepreneurship and Innovation Systems: Evidence from Europe*. Ed. by F. Malerba. London: Routledge. 198–218. URL: http://dx.doi.org/10.4324/9780203857403.

Rosa, A., R. Mamede, and M. M. Godinho (2013). "How Cross-Fertilization of High-Tech and Low-Tech Sectors Creates Innovative Opportunities: The Case of The Wearable Electrocardiogram". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 135–145. ISBN: 978 1 78100 549 1.

Rosenberg, N. (1974). "Science, Invention and Economic Growth". *Economic Journal*. 84(333): 90–108. URL: http://dx.doi.org/10.2307/2230485.

Rosenberg, N. and R. Nelson (1994). "American Universities and Technical Advance in Industry". *Research Policy*. 23(3): 323–348. URL: https://doi.org/10.1016/0048-7333(94)90042-6.

Sallos, M., E. Yoruk, and A. García-Pérez (2017). "A Business Process Improvement Framework for Knowledge-Intensive Entrepreneurial Ventures". *Journal of Technology Transfer*. 42: 354–373. URL: http://dx.doi.org/10.1007/s10961-016-9534-z.

Salter, A. and M. McKelvey (2016). "Evolutionary Analysis of Innovation and Entrepreneurship: Sidney G. Winter – recipient of the 2015 Global Award for Entrepreneurship Research". *Small Business Economics*. 47(1): 1–14. URL: http://dx.doi.org/10.1007/s11187-016-9702-4.

Schneider, C. and R. Veugelers (2010). "On Young Highly Innovative Companies: Why They Matter and How (Not) to Policy Support Them". *Industrial and Corporate Change*. 19(4): 969–1007. URL: https://doi.org/10.1093/icc/dtp052.

Schumpeter, J. (1934). *The Theory of Economic Development*. Harvard Economic Studies. ISBN: 9780674879904.

Schumpeter, J. (1942). *Capitalism, Socialism and Democracy*. Harper and Brothers. ISBN: 978–0061561610.

Schumpeter, J. (1949). *Economic Theory and Entrepreneurial History-Change and the Entrepreneur. Postulates and Patterns for Entrepreneurial History*. Harvard University Press: Cambridge MA.

Shane, S. (2000). "Prior Knowledge and the Discovery of Entrepreneurial Opportunities". *Organization Science*. 11(4): 448–469. URL: https://doi.org/10.1287/orsc.11.4.448.14602.

Shane, S. (2003). *A General Theory of Entrepreneurship: The Individual-opportunity Nexus*. Northampton, MA: Edward Elgar Publishers. ISBN: 978–1843769965.

Shane, S. (2009). "Why Encouraging More People to Become Entrepreneurs is Bad Policy". *Small Business Economics*. 33(2): 141–49. URL: http://dx.doi.org/10.1007/s11187-009-9215-5.

Shane, S. and S. Venkataraman (2000). "The Promise of Entrepreneurship as a Field of Research". *Academy of Management Review*. 25(1): 217–226. URL: https://doi.org/10.5465/amr.2000.2791611.

Sharif, N. (2006). "Emergence and Development of the National Innovation Systems concept". *Research Policy*. 35(5): 745–766. URL: https://doi.org/10.1016/j.respol.2006.04.001.

Short, J., D. Ketchen, C. Shook, and D. Ireland (2010). "The Concept of 'Opportunity' in Entrepreneurship Research: Past Accomplishments and Future Challenges". *Journal of Management*. 36(1): 40–65. URL: https://doi.org/10.1177/0149206309342746.

Slepniov, D. and B. V. Waehrens (2013). "Managing International Expansion in a KIE Venture: Going Global in Alpha Composites". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 62–74. ISBN: 978 1 78100 549 1.

Slepniov, D., A. Lassen, S. Haakonsson, and M. McKelvey (2015). "Understanding Innovation Spaces of Emerging MNEs in China: An Explorative Case Study of a Chinese Wind Turbine Manufacturer". In: *Innovation Spaces: in Asia: Entrepreneurs, Multinational Enterprises and Policy*. Ed. by M. McKelvey and S. Bagchi-Sen. Cheltenham, UK: Edward Elgar Publishing. 103–123. ISBN: 978-1783475674.

Smith, K. (2005). "Measuring Innovation". In: *The Oxford Handbook of Innovation*. Oxford University Press. 148–177. URL: http://dx.doi.org/10.1093/oxfordhb/9780199286805.003.0006.

Søberg, P. V. (2019). "A Case Study of the Link Between Artificial Intelligence and Knowledge Creation in an Emerging Technology in China". In: *Innovative Capabilities and the Globalization of Chinese Firms: Becoming a Leader in Innovation Spaces*. Ed. by M. McKelvey and J. Jun. Cheltenham: Edward Elgar Publishing. ISBN: 978 1 78643 447 0.

Storey, D. J. (1994). *Understanding the Small Business Sector*. London: Routledge. ISBN: 978–1138683792.

Stuetzer, M., M. Obschonka, U. Brixy, R. Sternberg, and U. Cantner (2014). "Regional Characteristics, Opportunity Perception and Entrepreneurial Activities". *Small Business Economics*. 42(2): 221–244. URL: http://dx.doi.org/10.1007/s11187-013-9488-6.

Swedberg, R. (1991). *Joseph A. Schumpeter. His Life and Work*. Cambridge Polity Press. ISBN: 978–0745611747.

Timmermans, B., R. Bekkers, and L. Bordoli (2013). "Knowledge Reallocation and Challenges for KIE: The Case of the European Roller Coaster Industry". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 119–134. ISBN: 978 1 78100 549 1.

Venkataraman, S., S. D. Sarasvathy, N. Dew, and W. R. Forster (2012). "Reflections on the 2010 AMR decade award: Whither the promise? Moving forward with entrepreneurship as a science of the artificial". *Academy of Management Review*. 37(1): 21–33. URL: http://doi.org/10.5465/amr.2011.0079.

Vincenti, W. G. (1990). *What Engineers Know and How They Know It Analytical Studies from Aeronautical History*. Johns Hopkins University Press. ISBN: 978-0801845888.

Von Hippel, E. (1988). *Sources of Innovation*. Oxford: Oxford University Press. ISBN: 0-19-504085-6.

Vonortas, N. and Y. J. Kim (2016). "Managing Risk in New Entrepreneurial Ventures". In: *Dynamics of Knowledge Intensive Entrepreneurship: Business Strategy and Public Policy*. Ed. by F. Malerba, Y. Caloghirou, M. McKelvey, and S. Radosevic. London: Routledge. 121–141. ISBN: 978-1138025288.

Wiklund, J. and D. Shephard (2003). "Knowledge-Based Resources, Entrepreneurship and Performance of Small and Medium-Sized Businesses". *Strategic Management Journal*. 24(13): 1307–1314. URL: http://dx.doi.org/10.1002/smj.360.

Winter, S. (1984). "Schumpeterian Competition in Alternative Technological Regimes". *Journal of Economic Behavior & Organization*. 5(3–4): 287–320. URL: http://dx.doi.org/10.1016/0167-2681(84)90004-0.

Winter, S. (2013). "Habit Deliberation and Action: Strengthening the Microfoundations of Routines and Capabilities". *The Academy of Management Perspectives*. 27(2): 120–137. URL: http://dx.doi.org/10.5465/amp.2012.0124.

Winter, S. (2016). "The Place of Entrepreneurship in the Economics that Might Have Been". *Small Business Economics*. 47(1): 15–34. URL: http://dx.doi.org/10.1007/s11187-016-9701-5.

Witt, U. (1998). "Imagination and Leadership – The Neglected Dimensions of an Evolutionary Theory of the Firm". *Journal of Economic Behavior and Organization*. 35: 161–177.

Witt, U. (2008). "What is Specific About Evolutionary Economics?" *Journal of Evolutionary Economics*. 18(5): 547–575. URL: http://dx.doi.org/10.1007/s00191-008-0107-7.

Zaring, O. (2013). "Interaction as a Strategy in Knowledge Intensive Entrepreneurship: Case of an ERP Software Company". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 48–61. ISBN: 978 1 78100 549 1.

Zaring, O., S. Stefan, and M. McKelvey (2018). "Building Regional Innovation Capacity: Linking Knowledge-intensive Innovative Entrepreneurship and Innovation Governance". Working paper at Institute of Innovation and Entrepreneurship, University of Gothenburg, Sweden.

Zhu, Y. and M. McKelvey (2013). "Business Model in Big Data in China: Opportunities through Sequencing and Bioinformatics". In: *How Entrepreneurs Do What They Do: Case Studies of Knowledge Intensive Entrepreneurship*. Ed. by M. McKelvey and A. Lassen. Cheltenham: Edward Elgar Publishers. 189–204. ISBN: 978 1 78100 549 1.