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### Which Regions Benefit from Emerging Industries?

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## GUEST EDITORIAL

# Which Regions Benefit from Emerging Industries?

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When new industries emerge, initial locations are usually unevenly distributed across space and differ with respect to their participation in the growth of the industry during its life cycle. To explain these differences, locational advantages with respect to venture capital, existing industrial structures, as well as market and growth potentials are regularly put forward. However, our concepts for understanding the regional and local pattern of development and the underlying mechanisms are still in their infancy—despite the fact that policy-makers when introducing smart specialization programmes are already relying on them by addressing entrepreneurial discovery processes, regional competences and infant industry policies.

To fill that lacuna, the contributions to this special issue of *European Planning Studies* present theoretical as well as empirical research on the emergence of new industries in space. They offer two perspectives on the topic, first, aspects of the creation of new industries and second, the subsequent development of a newly generated industry in the medium and long term. As regards, the question about the creation of a new industry or how a region *A* induces the establishment of a new industry *x* the papers contribute to different strands of literature, such as the effects of related (seed) industries (Klepper & Simons, 2000; Boschma & Wenting, 2007; Buenstorf & Klepper, 2009), but also highlight the role of spin-offs or entrepreneurs for industrial transformation (Buenstorf & Fornahl, 2009). In search for mechanisms that contribute to a sustained development and success of new industry *x* in a region *A* the papers raise questions of how new industry structures fit into the existing industrial landscape. The results suggest value chain and specialization

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externalities (Marshall, 1920), urbanization externalities (Jacobs, 1969), network integration (Agarwal-Tronetti & Bayus, 2004) and related variety (Bürger & Cantner, 2011) as main drivers of success of new technologies or industries in a region.

Further on, the predominately aggregate analysis on industry emergence can be accompanied by a comprehensive view on the mechanisms relevant for industrial transformation at the firm level. Here, resource- and competence-based theories at the micro-level complement meso-level views on new industry development. This body of literature highlights the importance of specific key actors who have the competence to re-organize their industry environment (Jacobides *et al.*, 2006), the role of pioneering activities that are succeeded by anticipators and followers (Agarwal-Tronetti & Bayus, 2004), the role of established organizations such as incumbents and their knowledge (dis-) integration behaviour (Brusoni & Prencipe, 2006; Brusoni *et al.*, 2009) and the analogue to regional branching at the firm level, that is exaptation (Dew *et al.*, 2004).

Combining the micro- and meso-perspectives we address the key question “Which regions benefit from emerging industries?” in this special issue. The first paper by Claus Michelsen, Harald Wolf, and Michael Schwartz picks up entrepreneurship as a key mechanism in industrial transformation. The authors analyse factors that determine the transition from nascent entrepreneurship to real entrepreneurship using the example of biotech industry in Germany. While scholars have concentrated mainly on factors related to individuals to explain this changeover, framework conditions have been mostly neglected so far. Given that entrepreneurship is a strongly localized phenomenon, this paper finds that general as well as specific regional opportunities and the entrepreneurial environment are the driving forces behind the transition from nascent entrepreneurship to new venture creation.

Dirk Engel, Timo Mitze, Roberto Patuelli, and Janina Reinkowski resume the discussion on policy efforts for an effective stimulation of new industries. They evaluate whether two large policy programmes in the German biotechnology industry (BioRegio and BioProfile) have a positive effect on research and development. Both programmes are organized in the form of contests and aimed at fostering the performance of innovative firms which participate in regional research clusters. Using difference-in-difference estimation techniques, their findings show that winners of the contest generally outperform non-winning firms during the treatment period. The findings imply that public funding as well as the stimulating effect of being a winner of the contest have positive effects on research and innovation activities.

The paper by Michael Wyrwich analyses the effects of regional conditions on the initial emergence of knowledge-intensive business services (KIBS). With special reference to the post-transition region of Eastern Germany, the author shows that KIBS emerged particularly in densely populated areas with a larger market size. Furthermore, the regional stock of knowledge positively impacts the start-up activity in East Germany. The latter finding is particularly interesting since KIBS did not exist in the German Democratic Republic and specific human capital was virtually absent when the reunification took place. Overall, it can be concluded that regional conditions matter for the emergence of new business even though a planned economy shaped these conditions for a long time.

The paper by Sebastian Henn adopts a transnational entrepreneur perspective to explain the spatial evolution of new industries in developing and emerging countries. He argues that through close-knit community networks transnational entrepreneurs can transfer specific knowledge on external markets and technologies internationally and over great

distances at low costs. When integrating external knowledge into the knowledge flows between their peers at a given location, they can shape the preconditions for an industrial cluster even at places that do not have any industry-specific advantages at all. The author concludes that such patterns of cluster evolution are particularly relevant in labour-intensive manufacturing industries in developing or emerging countries that have low labour costs and no established knowledge on the relevant production techniques.

The photovoltaic industry serves as an example in three contributions of this special issue, combining the analysis of the emergence of new industry with the development, evolution, and reshaping of existing industries. The paper by Mark Knell provides insights on the role of photovoltaics as part of the energy system. He argues that oil and gas served as energy source at low cost for the era of mass production and the first half of the information and communication technology revolution. But the increasing scarcity of oil and gas and the introduction of carbon pollution taxes make this source of energy more and more costly. On the other hand, so-called multi-source renewable energy networks emerge as an alternative to conventional energy supply. The author shows that low-carbon energy technologies, among them solar photovoltaic, fit well into the current techno-economic paradigm. Future possibilities of low-carbon energy technologies are discussed.

The paper by Matthias Brachert, Christoph Hornych, and Peter Franz relates to the debate on seed industries and the regional dimension of industry emergence. They analyse the spatial evolution of the German photovoltaic industry referring to the “window of locational opportunity” and the “selection environment” concept. They find that industry emergence is supported by the presence of related industries such as the microelectronic industry. Furthermore, the authors present findings that the emergence of the photovoltaic industry was accompanied by a relatively rapid spatial concentration of production and an intensified networking between firms and between firms and science organizations. They conclude that the responsiveness of regional institutions and the self-organising capabilities of the photovoltaic firms confirm propositions made in the “selection environment” concept.

Finally, Antje Klitkou and Lars Coenen analyse the emergence of the photovoltaic industry in Norway. They apply a regional innovation systems approach to analyse the spatially differentiated development of the photovoltaic industry in Norway. The historical perspective on the Norwegian photovoltaic industry as well as the network analyses of its knowledge dynamics indicates a marked spatial pattern of both intra- and inter-regional industrial development. The authors describe an industrial branching process that reinforced the original cluster in Oslo through urbanization economies but also initiated industrial activities in other regions through knowledge spillovers from incumbent process industries. They conclude that while this spatial unevenness has facilitated the built-up of industry, it also poses considerable limitations and challenges in the longer run.

What we learn throughout the papers of this special issue is that regional conditions substantially matter for the emergence of new industries. This, first, holds true for regional entrepreneurial opportunities enhancing the survival chance of new firms as well as the transnational dimension of entrepreneurship being relevant especially in structurally weak non-industrialized regions (see the paper of Sebastian Henn). Second, networks between heterogeneous actors strongly matter for the emergence of new industries (see especially the papers from Antje Klitkou *et al.* and from Matthias Brachert *et al.*). Third, the knowledge base of a region positively impacts the emergence of new economic

activities (see especially the paper of Michael Wyrwich). Finally, policy programmes designed as contests play an important role for the successful emergence of new industries (see the paper of Dirk Engel *et al.* and Claus Michelsen *et al.*).

Combining analytically the micro- and meso-perspectives in this special issue, taking different industries as an example, and opening the perspective also towards (re-)industrializing regions proved to be fruitful for answering our initial question—Which regions benefit from emerging industries? Yet, the factors determined and summarized above are far from complete or even final. For policy-makers, they give at least the hint that (smart) specialization is not everything, especially not in under-industrialized regions which do not only exist in developing countries. Furthermore, supra-regional external conditions can, on the one hand, facilitate new industry (e.g. transnational entrepreneurs) or, on the other hand, destroy newly emerging clusters (e.g. aggressive price competition). An overall recipe for success does not exist, and even the most sophisticated policy scheme cannot replace original entrepreneurial and innovative power.

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