
Introduction

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CONVENTIONS AND CONTEXT

A substantial portion of innovation research and practice is focused upon new technology businesses. This is not surprising since, increasingly, entrepreneurship is the handmaiden of commercialized recombined new and existing knowledge, as Schumpeter (Mark 1) correctly observed. Intellectually, the transformation of, for example, laboratory discoveries of genetic sequences and associated molecules that may interrupt or prevent disease into therapeutic treatments by dedicated biotechnology firms is interesting for three reasons. First, it shows how the most advanced science-based research is now often to be found in the laboratories of research institutes inside leading research universities rather than corporate laboratories. This represents a geographical shift in the centre of gravity of 'translational' knowledge in the life sciences, which attracts agglomerations of entrepreneurial businesses as innovation systems theorems predict. However it does not do so uniformly, which hints at crucial qualitative elements that need to be teased out of the data to explain the marked spatial unevenness of contemporary knowledge dynamics (see also Isaksen's Chapter 22 on 'Cluster evolution' in this *Handbook*).

Second, new agglomerations of the kind under inspection tend to be exemplars of clustering, embracing the collaborative networking based on high-trust learning and associated social capital that exercises many of the accounts in the preceding sections of this *Handbook*. Accordingly, new organizational forms and mechanisms of communication of cumulative and combinative knowledge – external to the corporate management confines of the large or multinational firm – come into play. Whereas large corporations are universally understood to have competitive advantage because their legal and administrative conventions, identity and path-dependence lends them their 'corporate culture', clusters have to work out their conventions by trial and error. This can involve 'translation' issues, negotiation of meanings in 'transition zones' among scientists, investors and entrepreneurs that are managed through corporate divisions of labour within frameworks of shared meanings acquired by practice and in-house training in the large corporation.

Yet, for all such potential pitfalls, innovation is often more efficient and effective in clusters than corporations, otherwise they would not thrive. This hints further at some key advantages of agglomeration for knowledge economy innovation which seem to include: externalized, Marshallian 'in the air' or 'cloud-type' knowledge access advantage; relational commitments substituting for formalized transactions; and increasing returns to learning yielding greater creativity than scaleable corporate efficiency.

Finally, chapters in this *Handbook* on the competitive strategies of neo-Marshallian clusters by Bellandi (Chapter 6) and Belussi (Chapter 7) remind us that learning is also organizational in that regional competitiveness (Martin, Chapter 18) depends upon innovative versatility, agility and flexibility towards meeting customer needs. For many

such product and process innovations, the research literature (for example Sydow et al., cited in Martin, Chapter 15) reveals such clusters to be substantially less path-dependent and prone to mission 'lock-in' than corporations.

In Chapter 25, the first chapter in of Part V on 'Regional Worlds of Innovation', Peter Sunley frames propositions such as these according to the well-known Storper and Salais 'worlds of production' grid. Crucially, however, Sunley proceeds to push beyond its categories to explore the conventions and production culture implications of the approach in an illuminating critique. As will become clear, the chapter is an organizational prelude to a number of chapters that explore changing 'worlds of innovation' in sectors such as services, culture and processes such as 'open innovation' that are less commonly analysed in regional innovation studies than are new or advanced manufacturing. In brief, the worlds of production approach went beyond the binary cluster–corporation organizational contrast adumbrated above, to demonstrate a further two dimensions to the debate, arguing for diversity in multiple pathways to modern industrial organization through distinctive models of coordination (Carrincazeaux and Coris, Chapter 20, this *Handbook*) based on conventions that enhance collective communication and cognition.

Production (and associated innovations) can be standardized or specialized, as delineated above, but the extra dimensions proposed are that they can be dedicated or generic. The four resulting cells of production occupy different worlds, the specialized and dedicated product being highly uncertain and reliant on untraded (trust, discretion and so on) interdependencies between customer and supplier. Contrariwise, the standardized and generic product sells to a mass market mainly competitive on price. The grid is really a set of four cost–quality resolution vectors. Is it useful to the project of understanding key tensions and their conceivably impermanent solvents in regional innovation and growth? As with all ideal types, it is informative but rigid; hence it is not clear whether for firms the categories are path-determined or capable of mutation, and how the latter might work. There is reference to firm experimentation to settle on appropriate production conventions but the evolutionary mechanisms and whether or not (re)location is involved are not explored.

Nevertheless, different regions are said to possess the requisite conventions and culture for each 'world of production', and 'lucky' are those with highly 'relational' regional regimes (equivalent to 'cloud-type' settings above). This implies that as the global innovation paradigm becomes more knowledge-intensive, relational regional regimes are absolutely advantaged, which is at least an interestingly testable proposition, which is strongly supported by, for example, research on the 'creative class'. A large measure of this advantage in a globalized knowledge economy is that Schumpeterian entrepreneurial imitation becomes almost impossible, securing regional competitiveness for innovative clusters and regions in the face of 'global shift'. The study of innovation can potentially make important inroads into understanding varieties of regional creativity and its associated culture and conventions.

Accordingly, one of the worlds of production increasingly explored in economic geography is that of culture itself. Luciana Lazzeretti (Chapter 26 in this *Handbook*) undertakes this task, advocating an evolutionary economic methodology with a focus on explaining the production and reproduction of Flamenco in Andalusia. An important point here is that the production of culture can stimulate innovation that in the guise of creative industries can regenerate or otherwise renew geographic spaces. What

context and convention makes for a hub in a global–local network of cultural economies? Lazzeretti notes that for ‘high cultural’ hubs, it is essential to be a culturally distinctive, ‘paradigmatic’ locale – renaissance city, Art Deco district and so on – with an institutional ‘regime’ that recognizes the cultural economic potential to translate the production of culture into communications, conferences, events and destinations. The key conventions are sensibilities to specific heritage, framing of experience and projecting of learning opportunities. This represents a transition in conventions from ‘economic enhancement of culture’ (culture as factor of production) to ‘cultural enhancement of economy’ (culture as creative capacity). Within the latter, certain practices occur that represent a convention of openness to improvisation: for example, co-location of optical physics and art restoration in Florence cross-fertilized ‘episodic’ radical innovation in laser cleaning instrumentation. By contrast, the Andalusian Flamenco ‘brotherhoods’ and ‘fraternities’, framed by a context of ‘sacred and profane’ festival culture, are closed and display high social capital but mainly incremental, organizational innovation. For example, foundations and institutions to preserve, learn and reproduce traditions would be a case in point.

INNOVATION IN SERVICE INDUSTRIES

If ‘closed societies’ represent excellent starting points for understanding the distinctiveness of particular production cultures in geographic space, the difficulties of penetrating them for research purposes need also to be understood. Yuko Aoyama and Rory Horner’s Chapter 27 in this *Handbook* on service innovation is more a case of exploring *terra incognita*, so little has there been investigation of this largest part of most economies in the relevant literature. Their chapter is a valuable review of the existing service innovation literature, which contains relatively little on regional services innovation. This is tackled in the succeeding Chapter 28, where some interesting and important comparisons on levels and types of regional services innovation are presented. Chapter 27 reviews the literature that has discovered service industry innovates in branding advertising and financial intermediation; it also expends research budgets in conducting various kinds of knowledge-intensive activities related to financial analysis, engineering consultancy and design-related activities (KIBS). Indeed Lazzeretti’s cultural economy and creative industries were shown to be capable of sustaining innovation. Measurement can be difficult and misleading since indicators were historically devised with manufacturing in mind. Thus service innovation is measured at a tiny fraction of total research and development (R&D) in typical national statistics. Nevertheless, digital services are largely part of the ‘informatization’ long wave and therefore contribute to that radical overarching paradigm, though it is notable that innovations like e-commerce depend entirely on innovations from the mechanization and motorization eras for product delivery.

When we examine aspects of regional services innovation (Chapter 28 by Philip Cooke) we find a complex picture involving interesting and instructive contrasts with typical regional innovation profiles. Thus one of these is that some service industries are measured as more innovative than some engineering industries. As noted in Chapter 27, many services innovations are organizational, including budget airlines, online

banking and online insurance, which all gained competitiveness by removing vast layers of administrative overhead, increasing capital productivity and identifying unserved market segments (for example hard-to-insure drivers). Each of these fields benefited from deregulation in air transport and financial services markets; accordingly they can, to a considerable extent, be considered instances of ‘supply-side driven innovation’ discussed in Chapter 1, the ‘Introduction’ to this *Handbook*. The geography of such innovations is interesting because, on the one hand, low overhead means headquarters locations are not directly growth locations; but on the other, airports, where the service is consumed, clearly are – tourist destinations too. Moreover, such airports are as likely to be regional as national ‘hubs’ due to cost considerations. Also because of some degree of call-centre service associated with some such services innovation, notably in finance, low-labour-cost regions domestically and abroad benefit, contingent on language and communication skills.

One of the possibly surprising findings of a comprehensive comparison of innovation indicators across manufacturing and services is that in the UK, London is the least innovative geographical area. This has been known for some time with respect to manufacturing innovation, something that is habitually put down to its deindustrialization and ‘tertiarisation’ over many years. But London is also the least innovative services region in the UK, including the creative industries. Accordingly, a new picture emerges of the UK’s capital city as the location of a huge density of un-innovative administrative, banking and retail jobs interspersed with a few ‘village’ hotspots that may gain disproportionate attention in the relevant research literature. Around London, in the East and South-East are found higher than average innovation indicators in services, especially creative and KIBS, as well as manufacturing. The broad regional profile of a metropolitan ‘doughnut’ of command and administration functions surrounded by a semi-rural idyll including islands of high creativity and innovativeness seems inescapable. It is also rather common, since land rents and congestion in central metropolises discourage ‘cloud-type’ set-ups but favour corporate and, to some extent, government administration willing and able to pay for expensive real estate. Returning momentarily to Peter Sunley’s review of ‘regional worlds of innovation’, certain spatial conventions arise from these diverse contexts, notably the metropolis as the scene of the ‘dull compulsion’ of ‘standardized’ administrative commuting, sugared with opportunities for cultural consumption. Meanwhile, innovators and ‘creatives’ inhabit ‘specialized’ metropolitan enclaves and ex-urban satellites easily accessible for occasional face-to-face investor contact, or the same cultural consumption experience hosted by the metropolis.

OPEN, EMERGING AND GREEN INNOVATION

Moving on, and capturing one of Aoyama and Horner’s Chapter 27 service industry innovations, in Chapter 29 of this *Handbook* Peter Prud’homme van Reine explores ‘regional open innovation’. Open innovation involves corporate outsourcing of innovation services to knowledge-intensive clusters where firms expert in the task in hand perform the service at considerably less cost than it could be undertaken in-house by the customer corporation. It is the equivalent for manufacturing firms of outsourcing the management of their supply-chain, procurement process or design engineering requirements to consultants

or other intermediaries, something in which they have been engaged since the onset of 'lean production' in the 1990s. Silicon Valley is a classic space of open innovation whose conventions are characterized by: open information flow and learning among firms and between firms and regional universities; rapid response capabilities to changing contractual market opportunities; willingness to experiment and take risks; organizational hierarchies; and ready occupational mobility. As suggested in introducing James's Chapter 19 in this *Handbook*, this is a uniquely framed 'cloud-type' learning space although elements of it have been emulated elsewhere (see Shefer and Frenkel's Chapter 38 in this *Handbook*). Open innovation can thus be intraregional or interregional.

The latter can be influenced by 'quality of place' conventions, referring to aspects including aesthetic design and architecture, high-grade natural environment, recreational facilities, the presence of a diverse set of creative people, housing conditions, smart infrastructure, vibrant city life, symbolic capital and a regional 'brand'. Yet other cases show multinationals establishing networks of entrepreneurs centred in technology hubs in several regions around the world, each hub focusing on its regional technological specialism. Alternatively corporates have mapped the main global locations of their research 'centres of excellence' onto globally excellent research regions. This strongly suggests a potential list of such locations in the convention mapping of multinational capital; talent, technology and tolerance being the main criteria.

Open innovation is merely one way in which foreign investment and regional innovation interact. In Philip Cooke and Dafna Schwartz's Chapter 30 on foreign direct investment, a number of other factors are brought into play. One of the most interesting recent features is that foreign direct investment (FDI) is increasingly conducted by micro-multinationals (as discussed in Isaksen's Chapter 22 on 'born global' small and medium-sized enterprises, or SMEs). This is not only a phenomenon whereby European or North American SMEs locate in Chinese or Indian 'quality-of-place' locations, as Chinese SMEs also increasingly locate in, for example, Italian industrial districts (numbering 3000 in Prato, near Florence, alone in 2007). The authors quote David Teece as averring that this process of cluster upgrading occurred at the behest of large foreign investors or final customers in the past. The Chinese insertion (convention displacement) into the hitherto partly-obscured 'world' of the Italian industrial district would also make an excellent 'production conventions' candidate since the Chinese seem to have been readily able not only to absorb Italian practice but also to transcend it with their own. This inverts the normal line of reasoning in FDI research which asks how FDI knowledge influences the host region by asking how regional knowledge influences FDI.

This is addressed in Scott Ptak and Sharmistha Bagchi-Sen's Chapter 31 on regional innovation in India, introducing the idea of the 'international system of innovation' to supplement it. This is not least because emerging economies find difficulties in framing these rather complex system-entities. It is well known that Indian science and technology innovation is blessed with excellent endogenous research institutions, but it benefits also for innovation in centres like Bangalore, Hyderabad and Mumbai from its 'to and fro brain drain' relationship with Silicon Valley and its technologies and venture capital expertise. This too is an interesting research candidate for studying the economic geography of regional socio-cultural conventions (convention mutation). By this point, these do not appear to pose any significant barrier to global knowledge flows, as the chapters in this section of the *Handbook* consistently show.

Finally, Chapter 32 on 'green innovation' or regional eco-innovation by Philip Cooke indicates that one way in which conventions are absorbed, reutilized and innovated is through branching from path-dependence. Some regions envision their futures according to normative frames such as 'sustainability', 'healthiness' or 'cleanliness', and are able to pursue collective learning and entrepreneurship practices that realize such visions without losing contact with their founding technologies. The evolution of regional eco-innovation systems in regions such as (once again) northern California and north Jutland, Denmark bear witness to the power of the evolutionary perspective in tracing various cluster relatedness mutations that have underpinned their accomplishments in transitioning from fully carbonized to 'green' innovation.