

## Innovation and Toronto's Cognitive-Cultural Economy

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## Introduction

The term “creative” is increasingly employed to characterize a broad sweep of novelty-producing industries, regions, cities, occupations, workers, and tasks, but the multiple meanings attributed to the word have caused some confusion. In this chapter we investigate the concept of the *cognitive-cultural economy (CCE)*, a promising framework for apprehending the key novelty-producing and wealth-generating features of the contemporary urban economic and social order, and apply it to the case of Toronto. As laid out by Alan Scott in *Social Economy of the Metropolis* and other recent publications (Scott 2010; 2008a,b,c; 2007), the concept of the cognitive-cultural economy emphasizes the economic and social significance of a group of industries, occupations, work tasks, and functions with high *cognitive and/or cultural intensity* in the growth of core metropolitan regions.

The cognitive-cultural economy is closely associated with contemporary processes of urbanization, globalization, and ‘worlding’ (Roy, 2009). Urban regions have become the economic motors of the world economy (Berube et al., 2010; Scott et al., 2001) as well as the principal sites of cognitive-cultural production and consumption (Scott, 2008b). The predominance in cognitive-cultural production of global urban hubs such as New York, London, Los Angeles, Paris, and Tokyo suggests that the contemporary CCE “is both firmly anchored in specific places and a very insistent element of the global economic order at large” (Lorenzen, Scott, & Vang, 2008).

The cognitive-cultural economy has emerged in different configurations and manifests different degrees of local value-creating capability in different places (d’Ovidio, 2010; Kloosterman, 2010). What accounts for the greater growth and vitality of cognitive-cultural economic activity in some places rather than others? An important debate is currently taking place among geographers, demographers, regional economists, and urban planners about the relative contributions of various cognitive and cultural occupations and industries to economic growth, the significance of urban amenities and services in the attraction and retention of talent and investment, the modalities and processes of effective planning and governance of metropolitan cognitive-cultural economies, and the consequences of cognitive-cultural economic development for income distribution (Bontje and Musterd, 2009; Donegan et al., 2008; Indergaard, 2009; Scott, 2011, 2010, 2008a, 2004; Storper and Scott, 2009; Wolfe, 2009).

The division of cognitive and cultural labour within the global economic system has important implications for Toronto, Canada’s largest metropolitan area and its principal centre of cognitive-cultural economic production and consumption. The Greater Toronto Area (GTA) is a large and growing city-region with considerable economic weight. Its population of 5.6 million increases by approximately 100,000 people every year, and its Gross Domestic Product of \$327 billion gives the city-region the economic size of Argentina, South Africa, Venezuela, Ireland, or Finland. The Toronto population is highly educated and very culturally diverse. In 2001, 52 percent of the GTA’s population of those 20 years and over held a post-secondary degree, diploma or certificate (Gertler, Tesolin, & Weinstock, 2006). As the headquarters of nearly 40 percent of all business operations in Canada, Toronto is Canada’s largest regional economic

engine. Of the total labour force of 3.7 million in the Toronto region, 14.3 percent of workers are employed in the manufacturing sector; 8.6 percent in the professional, scientific, and technology services sector; 3.3 percent in the information and cultural industries; and 1.9 percent in arts, entertainment, and recreation (TRRA, 2010).

Toronto enjoys a position as first among equals in the domestic cognitive-culture economy and has emerged as a major regional second-tier city on the basis of its strengths in a range of cognitive-cultural industries and activities, including information and communication technologies (ICT), R&D-based industries, financial services, and creative and entertainment industries. Many among Toronto's business, political, and social elite would like to see Toronto rise further in the world urban hierarchy to become a top-level global city, as articulated by the Toronto Board of Trade in its recent Action Plan for the Toronto Region titled *From World-Class to World Leader* (Toronto Board of Trade, 2009). Toronto faces stiff competition internationally, however, as a supplier of cognitive and cultural products and services. Many organizations produce scorecards or benchmarks that compare top cities on a range of dimensions that are believed to matter when cities compete with each other to attract talent and investments. A persistent finding of these endeavors is that to get to the top, Toronto's performance needs to improve. Although Toronto consistently ranks among the top two dozen cities in the world according to many indicators, rarely does it rank as number one in something. Observes a recent report analyzing Toronto's "3 Ts" of technology, talent, and tolerance, "Toronto is not currently a leader within its group of competitive peers" (Martin Prosperity Institute, 2009: 22).<sup>1</sup> In core industries of the CCE (biotechnology, screen arts, finance, and ICT), Toronto consistently ranks third among North American cities.

This sort of diagnosis strikes a nerve among those who believe that Toronto must excel globally in some area in order to differentiate itself from other world cities. As Toronto's recent economic development vision statement *Agenda for Prosperity* (2008) puts it, "Toronto is a city on the cusp" of success but other jurisdictions are investing more effectively to develop capabilities needed for global prominence.

The ISRN project on "Social Dynamics of Economic Performance in City-Regions" postulates that urban economic performance critically depends on successful *innovation* as a core capability. This chapter critically address Scott's concept of the cognitive-cultural economy from the perspective of *innovation* – the creation of value through new Schumpeterian combinations. The CCE is a vast generator of innovation, creating value through "scientific knowledge inputs, continuous innovation, product multiplicity and differentiation, the provision of customized services, symbolic elaboration and so on" (Scott, 2008: 64). It is not straightforward, however, to apprehend innovation in the cognitive-cultural economy. Much cognitive-cultural innovation is not solely or principally technological. Instead, it is a combination of organizational,

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<sup>1</sup> The study compares Toronto with North American city-regions of similar population size including Detroit, Montreal, Boston, New York, Chicago, Atlanta, Dallas, Seattle, Vancouver, and Los Angeles.

technological, and “soft” (aesthetic) innovation which is often enabled and amplified by ICT adoption. Accumulated conventional knowledge, conceptual frameworks, and stylized facts about technological innovation dynamics are of limited utility as reliable guides to innovation in the CCE.

The chapter has two parts. In the first, we address a pair of key conceptual and methodological issues: how to operationalize the concept of the CCE, and how to conceptualize, observe, measure, and assess innovation in the cognitive and cultural branches of the CCE. The second part of the chapter applies the CCE concept to the case of Toronto, a major regional city but not a central hub in the network of global cities. We provide a high-level review of innovation dynamics in Toronto's cognitive, cultural, and ICT sectors and briefly discuss three principal kinds of value-creating spillovers (knowledge, product, and network) typical of the cognitive-cultural sector, illustrated with examples from Toronto's screen-based media industry. Our analysis draws on the scholarly research literature, a survey of innovation among hundreds of firms in Toronto's creative and entertainment industries, and well over one hundred interviews undertaken in conjunction with the ISRN “Innovation and Creativity in City-Regions” project.

### **The Cognitive-Cultural Economy**

Following Boyer, Scott uses four parameters to describe the capitalist cognitive-cultural economic and social order: leading sectors, the technological foundation, characteristic forms of labour relations, and typical competitive practices (Scott, 2007). The *leading sectors* of the CCE are “technology-intensive manufacturing, services of all varieties (business, financial, personal), fashion-oriented neo-artisanal production, and cultural-products industries (including media)” (2007: 1467). The common *technological foundation* of the CCE is provided by ICTs, which enable critically important capabilities in adopter industries. The characteristic forms of *labour relations* in CCE industries, according to Scott, are substantially flexibilized working conditions, deroutinized labour processes, and destandardized outputs. *Competition* in CCE industries is intense because of globalization and very high rates of innovation.

The concept of the CCE captures and foregrounds the two major waves of primarily non-technological innovation that animate contemporary capitalism: industrial proficiency in creating and commodifying culture, and analogous proficiency in the rationalization of economic production. Cultural production and rationalization of production are enabled and accelerated through embodied technological progress provided by ICTs, which have become a necessary but not sufficient condition of successful cognitive-cultural innovation.

Scott notes that in the cognitive-cultural economy “the realm of human culture as a whole is increasingly subject to commodification” (1997: 323). Proficiency in creating and commodifying culture stimulates and caters to a very wide range of consumers' subjective and affective needs and desires. The commodification of culture on an industrial scale is a historically novel feature of contemporary capitalism. It has induced to widespread aestheticization of daily life (Featherstone, 1991), leading to what various authors call the “society of the spectacle”, the “dream society”, the “emotion economy”, the “attention economy”, or, as expressed in the title

of Pine and Gilmore's 1999 classic, *The Experience Economy*, in which "work is theater and every business a stage".

Cognitization, the other major wave of innovation in the contemporary postindustrial economy, provides capability for strong information handling, storage, and analysis in support of highly rationalized control of information flows, organizational processes, coordination, and feedback loops (Beniger, 1986). This capability is directly enabled by adoption of ICTs. Cognitive functions and tasks are major beneficiaries of embodied technical progress realized through the adoption of capital equipment and the use of external technical services. Strong information handling ability and high levels of rationalized control constitute the backbone of "regimes of computation" (Hayles, 2005) which arise from adoption of ICTs in industry and government for purposes of communication, coordination, administration, analysis, risk assessment, optimization, and decision-making. The information-intensification and rationalization of the organizational world requires increasing degrees of "cognitization of work" (Kallinikos, 1999). Information-intensity, rationalized control, and cognitization of work imply an economic and social order variously called the "information economy", "knowledge society", or "learning economy".

Clearly, the concept of a cognitive-cultural economy faces major challenges of operationalization before accurate comparative observation and benchmarking can take place. Nevertheless the broad outlines of the theoretical framework are clear. The cognitive-cultural economy is represented by certain *industries or sectors* that disproportionately rely on *work tasks, functions, and occupations* with high *cognitive or cultural intensity*. The three major *institutional components* of the cognitive-cultural economy are the *ICT supplier industry*, the *cognitive sector*, and the *cultural sector*.

- The ICT supplier sector, a major R&D-intensive cognitive industry in its own right, plays a uniquely important role in the CCE economy as supplier of foundation technologies to adopter industries, enabling cognitization of work tasks and functions and commodification of cultural products and services on an unprecedented scale. The cognitive and cultural industries are major customers of the ICT supplier industry. While cultural commodities originate and are consumed in the "content layer" of the digital economy, cultural commodification is enabled and amplified by advances in the software and transport layers (Yoo, Henfridsson & Lyytinen, 2010).
- The cognitive sector is marked by occupations with highly analytical, systemizing, and synthesizing capabilities, including analysts, managers, engineers, researchers, technicians, and accountants. It encompasses all R&D-intensive industries, all information-processing industries, most of the knowledge-intensive service sector, and the higher-level management, technical, and administrative functions of all industries, notably the the control, coordination, technical support, analytical, and technology-based novelty-producing functions of industries and government. Paradigmatic cognitive industries are the knowledge-intensive business services, R&D-based industries, and industries that are based primarily on information handling and analysis,

such as financial services.

- The culture-producing sector and associated work functions, tasks, and occupations deliver experiences, affect, meaning, social positioning, sensation, and subjective gratification as final outputs. The cultural sector is marked by occupations with highly specialized and distinctive creative, symbolic, expressive, and communicative capabilities, notably designers, writers, singers, actors, and interpreters of culture. The set of cultural industries included in the CCE is very broad, comprising the design, advertising, fashion, art, music, architecture, crafts, live and mediated entertainment, and tourism, as well as trans-sectoral cultural work tasks, functions, or occupations such as design, public relations, marketing, and advertising.

Combined, these three components of the CCE make possible flexible specialization, mass customization, commodification of culture, possessive individualism, financialization, and ubiquitous surveillance (Harvey, 2005).

### **Understanding Innovation in the Cognitive-Cultural Economy**

Schumpeter's view of entrepreneurial innovation encompasses the broad range of innovation dynamics visible in the contemporary CCE. Most national and regional innovation surveys, however, in line with standards established by the OECD over the past three decades, focus on the much narrower "Technological Product and Process" (TPP) innovation, which defines innovation almost exclusively in terms of R&D-based improvement of technical efficiency. Economic theory underlying TPP models of innovation conceptualizes value creation and economic growth as consequences of functional improvement in technology, the principal driver of production efficiency. Surveys that measure TPP innovation consider only technologically new or improved products or production methods and their related inputs, especially R&D spending, scientific publications, highly qualified manpower, patents, and product or process innovations.<sup>2</sup>

Innovation research has focused largely on the determinants and effects of R&D-based technical progress (Baregheh, Rowley & Sambrook, 2009). But it is well established that TPP-oriented innovation surveys do not capture the full range of value-creating non-technological innovation activities of firms. This issue has arisen regarding measurement of innovation in the service sector, e-business innovation, innovation in industrial clusters, and innovation in non market environments such as the social economy or the public sector, prompting researchers to argue for broadening the innovation concept (Arthurs et al., 2009; Bloch, 2007; Hauknes, 2003; Salazar & Holbrook, 2004). More recently, the limitations of the TPP-oriented innovation framework have been emphasized with respect to the value-creation processes in the cultural sector (Eltham, 2012; Jaaniste, 2009; Stoneman, 2010).

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<sup>2</sup> Guidelines for measuring innovation are set out in the *Oslo Manual*, currently in its third edition (OECD, 2005).

Since 2005, OECD-inspired innovation surveys include certain aspects of marketing and organizational innovation, but only when they are deployed in support of TPP innovation (OECD, 2010a,b). Left aside is a quite broad range of value-creating Schumpeterian combinations which are not directly related to productivity-enhancing technological improvements (Hawkins & Davis, 2012). For example, the Sawhney-Wolcott-Arroniz (2006) model of innovation, which transcends the TPP model, identifies twelve dimensions of business innovation (offerings, brand, platform, networking, presence, supply chain, organization, processes, value capture, solutions, customers, and customer experience).

Innovation along most of these dimensions is enabled by ICT adoption, relying on cognitive work tasks, functions, and occupations within the firm. Research and policy statements about Canada's productivity gap with the U.S. always point to Canada's lower levels of investment in ICTs and slower ICT adoption rates as key causal factors (Sharpe, 2006). Investment in ICTs improves business performance in two ways: by increasing production efficiencies and through qualitative enhancement of brands, positioning, relationships with customers, and relationships with suppliers.<sup>3</sup> The latter is noticeably the case when small and medium enterprises adopt ICTs, and firms with fewer than 50 employees represent nearly 98% of all firms in Canada. Thought leaders on value creation with ICTs advocate first determining the value the firm wishes to create and only then considering how ICT can help support the firm's value-creating strategy (Hopkins, 2010).

Roles for cultural occupations, functions, and tasks are mostly present in the product innovation, service, HR, and marketing activities of the firm, especially in the branding and customer experience dimensions of the model. From the perspective of the cultural sector, the weakest part of this model is the *customer experience* dimension, which remains largely a black box in the model. Much past research conceptualizes customer experience in terms of satisfaction, loyalty, or intent to purchase. These outcomes do not do justice to firms in the cultural sector, for whom the principal value proposition is to produce experience through "soft innovation", which is defined by Stoneman as "changes in goods and services that primarily impact upon sensory or intellectual perception and aesthetic appeal rather than functional performance" (2010: 329). Since firms in the cultural sector create value by providing experiences, research on innovation in cultural industries needs to focus on how commodified experiences create value for customers.<sup>4</sup>

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<sup>3</sup> For a recent review of the literature on firm-level effects of ICT adoption see Brynjolfsson and Saunders (2010).

<sup>4</sup> In his influential theory of consumer value, Holbrook (1999) identifies eight kinds of perceived hedonic and utilitarian value: efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality. See also Smith and Colgate (2007) for a more recent formulation of types of value. For examples of research on value creation through production of experience in specific segments of cultural industries see Chan (2009) on museums, Davis and Vladica (2010) on animated film, Fiore and Kim (2007) on retailing, Gallarza and Gil (2008) on tourism, Hume and Mort (2008) on performing arts, Park (2004) on restaurants, and Zomerdijk and Voss (2009) on services.

Analysis of TPP innovation usually assumes that the rate and magnitude of firm-level product innovation are in general positively related to economic performance. But since product innovation is ubiquitous in the cultural sector, no straightforward relationship exists between rate or magnitude of product innovation and economic performance among cultural firms. Typically, cultural products are horizontally differentiated. Horizontal product innovations "entail a new product that is more highly valued by consumers who place a lower value on the existing product" leading "to products with different characteristics that are preferred by consumers with different tastes" (Soberman & Gatignon, 2005: 168). Horizontal product differentiation results in the proliferation of products and an increasingly fine segmentation of taste markets, a frequently-observed phenomenon in cultural industries (Caves, 2000). Because in creative industries product innovation is pervasive, the principal indicators of the importance of a new cultural product are *extent of adoption* (Stoneman, 2010) or *critical acclaim* (Simonton, 2009).

In TPP innovation, formal R&D is the key source of new technical knowledge, complemented by suppliers, sales teams, customers, and service providers. But in the cultural sector, innovation in the content layer rarely calls on formal R&D, so levels of R&D spending, patents, or knowledge transfers from formal R&D institutions are inappropriate ways to measure knowledge flows. Instead, to capture the key dynamics of innovation in the cultural economy requires a conceptual framework that emphasizes knowledge flows among cultural producers, their intermediaries, and their customers. For example, Cohendet, Grandadam & Simon (2010) theorize the interactions, flows, and transactions in an urban cultural economy in terms of three institutional layers: an upperground constituted of firms and other institutions (including universities) that finance and launch products, an underground constituted of creative practitioners and their communities of practice, and a middleground constituted of intermediaries, hangouts, associations, and activities. Increasingly, frameworks must also take into account co-evolution among the content, software, and transport layers of a highly digitized cultural economy (Yoo et al., 2010).

Firm-level product innovation capability is a necessary but not sufficient condition for economically successful value creation. Experience goods face substantial uncertainty regarding market acceptance, as expressed in the famous "nobody knows anything" syndrome in cultural product innovation (Caves, 2000; de Vany, 2004). A recent survey of innovation in the Ontario Media and Entertainment Cluster, which is highly concentrated in the GTA, shows that television production, book publishing, and musical recording exhibit very high levels of new product development capabilities, and at the same time very low levels of profitability (HAL, 2009). Business capabilities that permit the commercial exploitation of creative product innovation capabilities require deliberate development in firms in the cultural sector (Davis, Vladica, & Berkowitz, 2008). The following sections situate the current dimensions of Toronto's cognitive-cultural economy and explore the nature of the innovation process within the CCE using this more comprehensive definition of innovation.



## Toronto's Cognitive-Cultural Economy: innovation and the ICT and Media Industries

Most recent assessments of Toronto's competitiveness include an evaluation of the city-region's innovation capability, which is generally interpreted as science- or technology-based innovation (TPP innovation as discussed above). For example, the OECD's recent *Territorial Review* of Toronto (2010c) provides a diagnosis of Toronto's R&D-intensive industries and assesses Toronto's innovation performance in terms of indicators of TPP innovation, largely leaving aside innovation in the cultural sector. Another recent assessment of Toronto's innovation status is provided by the Toronto Region Research Alliance (TRRA), a regional economic development organization that promotes increased investment in research and innovation in the Toronto Region Innovation Zone. Like the OECD *Territorial Report*, the TRRA finds that the Toronto region has a strong foundation in science-based industry but low citation impact, relatively low propensity to commercialize intellectual property, and comparatively low level of investment in innovation (TRRA, 2010). These reports pay little attention to the broader conception of innovation in the CCE that we have outlined above.

### *The ICT industry*

The Toronto region has the third-largest ICT cluster in North America. Around 29% of Canada's 40,000 ICT firms are located in the Toronto region. About half of Toronto's ICT firms are located within the City of Toronto and the others, especially the largest firms, are located in Toronto's suburbs of Markham and Mississauga. In 2004 the Toronto regional ICT industry employed 212,000 persons in services and manufacturing, making the Toronto cluster three times larger than the Vancouver or Ottawa-Gatineau ICT industries (Lucas, Sands, & Wolfe, 2009). In 2009 Toronto-region ICT companies earned \$52 billion in revenue, of which \$22B in manufacturing and \$30B in services (City of Toronto, 2010). Most of Toronto's ICT firms are very small; ninety-five percent are software developers, communications providers, or consulting service providers with fewer than 50 employees. The region is well represented among fast-growing or award-winning small ICT firms. Nearly 40% of the top 250 Canadian ICT companies are located in Toronto (City of Toronto, 2010), and nine of the 25 largest Canadian-owned ICT firms are located in the Toronto region.<sup>5</sup> Toronto also plays host to many of the largest transnational ICT firms with business operations in Canada. Toronto is home to more than 300 subsidiaries of transnational ICT firms. Of the top 25 foreign-owned ICT firms in Canada, 21 are located in the Toronto region (Branham Group, 2010).

The Toronto-based ICT industry is unlike other Canadian ICT clusters not only in terms of size and variety of specialties and segments, but also in terms of market orientation. While other Canadian ICT clusters are highly extraverted, the Toronto ICT cluster primarily serves the

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<sup>5</sup> The comparison with Waterloo, which has grown two of the largest and most dynamic Canadian-owned ICT firms, Research in Motion and Open Text, is unfavourable to Toronto.

domestic market (Lucas, Sands, and Wolfe, 2009). In 2004 the cluster earned about \$6 billion from export sales, representing around 15%-20% of the cluster's estimated \$30 billion to \$35 billion in sales (E&B Data, 2004). ICT firms in the Toronto region target four distinct customer markets: other firms operating in the ICT sector (24% of sales), consumers of digital communications and media products and services (24% of sales), financial and business services (16%), and the industrial sector (34%) (E&B Data, 2004). The strong local market (its size and rate of growth) is regarded by the Toronto ICT industry as the most valuable of its competitive advantages, eclipsing infrastructure and the availability and talent of the Toronto work force (E&B Data, 2004).

Strong domestic demand for ICT products and services from Toronto-based firms is evidence that the Toronto ICT industry plays an important role in diffusing cognitive occupations, work tasks, and functions into other domestic industries. Further evidence is provided by labour force data: of the approximately 173,000 ICT workers in the GTA in 2001, about 39,000 were employed in non-ICT sectors, notably finance and insurance and non-ICT manufacturing (E&B Data, 2004). Furthermore, the emergence of specialty ICT subclusters related to end-markets in mobile media, digital media, e-learning, financial services, social networking media, and e-health is attributed to strong demand from end-user industries in the local market. The emergence of early-stage IT specialties in the GTA is evidence of the importance of the local cognitive-cultural economic and social environment in innovation path creation. But Toronto's growth potential in telecommunications, a core ICT subsector of the CCE, is affected by the geographic decentralization of the telecommunications industry in Canada across five or six headquarter cities.<sup>6</sup>

In addition to its thick labour market, the Toronto region enjoys a dense ICT research environment. In 2004, there were nearly 100 ICT R&D centres within GTA universities, community colleges and other public institutions. Toronto's three universities each house a variety of specialized communications and advanced technology research labs. The Toronto ICT industry also has a complex support network for promotion of ICT business activity and professional development. There is evidence, however, of an important tradeoff between scale and effective governance: the "size, diversity and geographic spread of the ICT sector in the Toronto Region make it difficult to bring companies and organizations in the region together in a coordinated effort to improve the business environment and to establish the same level of brand awareness that their counterparts have achieved in other cities" (Impact Group, 2006: 20).

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<sup>6</sup> Unlike the U.S. and many other countries, no single Canadian city predominates as a telecommunications headquarters (Rice, 2006).

### *The media industry*

Toronto hosts the principal media agglomeration in English-speaking Canada and the third-largest in North America after New York and Los Angeles (Davis, 2011). In this agglomeration are found most of anglophone Canada's major screen production houses, public broadcasters, and many of its private broadcasters. Many Canadian book, magazine, music, and newspaper publishing headquarters are located in Toronto, as are four of the eight principal Canadian media conglomerates. The agglomeration includes the country's largest concentration of independent screen content producers, specialty broadcasters, supporting institutions, and many suppliers of specialized services and inputs: sound recording studios, law firms, post-production services, media marketing and publicity agencies, financial and insurance services, theatrical exhibitors, Internet publishing firms, technical service suppliers, advertising agencies, below-the-line crews and their craft unions, and public and private post-secondary educational programs. Tens of thousands of media microenterprises are present in the GTA (Davis, 2010). All three levels of media policy and program agencies are strongly represented in the city. Altogether the content layer of the Toronto media cluster (including film and television production, book, magazine, music, and interactive media) employed around 40,000 people and generated about \$4.5B in revenues in 2007 (Davis, 2011).

The six subsectors mentioned above are the designated components of the Ontario Entertainment and Creative Cluster, one of the few areas of the Toronto CCE to have been mapped in some detail using innovation survey methods and concepts adapted from technology-based innovation cluster analysis (HAL, 2009). In comparison with Canadian technology clusters, the Ontario media cluster reports a more difficult business climate, better government support, far greater importance of domestic competitors and customers, a larger critical mass, a higher level of self-awareness as a cluster, less dense linkages with local support institutions and associations, analogous business development and product innovation capabilities, and (with the exception of digital media) far lower expectations of growth and profitability (HAL, 2009).

If it were not for public policies and programs that provide production support and (in some cases) impose national origin requirements, many Ontario producers of books, television programs, films, music, and magazines would find it difficult to survive (Davis, 2011). It is a challenge for smaller English-language countries to develop competitive export industries for their cultural products unless these products are accepted among US consumers, who serve as de facto taste makers due to the size of the US market (Grant, 2008). At the same time, imported English-language cultural products take market share away from local cultural producers. High levels of imported English-language cultural products in the local market are a fact of life for Ontario cultural producers.

### **Innovation and spillovers in the cognitive-cultural economy**

According to Jacobs' hypothesis on the urbanization externalities that arise in larger and more diverse urban economies (Beaudry and Schiffrerova 2009; Ejeremo 2005; van der Panne

2004), a strong ICT sector in a diversified metropolitan economy with cognitive and cultural sectors should yield two main benefits of co-location with these other sectors: 1) greater ICT product and service variety, more rapid innovation cycles, greater market success for new products and services, and faster growth for ICT firms in the metropolis than for firms in smaller urban areas, and 2) more rapid uptake and effective use of ICT across the range of industries in the metropolis than in outlying regions. Cognitive-cultural innovation, which we emphasize has major non technological dimensions, is even more susceptible than technological innovation to such urban externalities. Cultural industries are most likely to flourish in an economic and social environment with high local variety and heterogeneous demand. Large metropolitan environments offer a much greater variety of potential adopters and a broader and deeper range of potential Schumpeterian combinations than socio-economic environments with lower diversity, giving metropolitan regions with great social and economic variety an important advantage in the cognitive-cultural economy. In such regions, innovation is driven by the many flows of knowledge via linkages, interactions, and spillovers within the cognitive-cultural economy proper and between the cognitive-cultural sectors and other sectors.

Thus, in principal, co-location between the ICT sector and user industries is beneficial to both, because knowledge and technology spillovers from the ICT sector into adopter industries provide abundant opportunities for exchanges of tacit knowledge and interactive learning between ICT suppliers and users with novel needs. The home market may serve as a driver of development for new cognitive products and services which later may be exported. On the other hand, the economic role of cultural industries is currently a matter of debate (Potts and Cunningham, 2008). Some authors argue that cultural industries may play a previously unsuspected strategic role as catalysts of variety creation across many industrial sectors (Bakhshi and McVittie, 2009; Frontier Economics, 2007; Potts and Cunningham, 2008). Further, the cultural sector may play a “general purpose” role in culturization, analogous to that played by ICTs in cognitization.

The cultural sector affects the broader economy in two principal ways (Frontier Economics, 2007). The first is by direct commercialization of cultural products and services. Here, business-to-business relationships are unexpectedly important. Bakhshi and McVittie (2009) and Bakhshi, McVittie and Simmie (2008) find that in the U.K., in the aggregate nearly 60% of the outputs of the fashion, software, architecture, publishing, advertising, the Arts, Radio & TV, and film industries are intermediate inputs for other businesses.<sup>7</sup>

The second way the cultural sector affects the broader economy is by localized spillovers of cultural knowledge into adopter or user sectors in ways that induce and enable innovation. Co-location is one indication of likely knowledge spillovers. In the UK, Chapain et al. (2010) report

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<sup>7</sup> Research on Toronto's media and entertainment industries finds comparable levels of orientation toward the local and regional markets in the book, magazine, film, television, and music industries (HAL, 2009), but further research is required to determine how much of this production serves as an intermediate input.

substantial co-location among firms in the cultural industries: between advertising and software firms, among music-film-publishing-radio-tv firms, and among advertising, software, advanced manufacturing, and knowledge-intensive business services. Toronto's cultural sector displays patterns of co-location among book and magazine publishers, electronic equipment repair firms, broadcasters, recording studios, software publishers, technical and trade schools, specialized design services, independent artists-writers-performers, performing arts organizations, advertising, grant-making services, event promoters, artists' agents, and spectator sports companies (Vinodrai and Gertler, 2007), suggesting the existence of largely undocumented knowledge transfers and spillovers among these industries.

Three kinds of spillovers are proposed for the creative sector: knowledge spillovers, product spillovers, and network spillovers (Frontier Economics, 2007). Below we describe and briefly discuss these three kinds of spillovers, each illustrated with a mini-case study from Toronto's media industry.

*Knowledge spillovers: digital visual effects and computer animation firms*

In the cognitive-cultural economy, knowledge spillovers occur when technologies developed in the ICT sector are adopted in other sectors in a cognitization process, or as when aesthetic attributes developed by one industry are transferred to another (or more properly, are created for customers) in a culturization process. Cognitization takes place in the cultural sector, for example, when cultural firms analyze customers' data exhaust to develop new product or service offerings (Zwick & Knott, 2009). Analogously, culturization takes place in the cognitive sector when the value proposition of a functional product or service is enhanced with aesthetic or symbolic attributes provided by a cultural discipline, as in the case of design, for example (Vinodrai, 2009).

The distinction between the cognitive and the cultural attributes becomes blurred when technology in the form of powerful animation and digital effects software contributes to culturization by enabling the creation of photorealistic moving images. Complex cognitive and cultural spillovers occur when a user industry borrows liberally from the worlds of technology and visual culture, and also contributes to these and other sectors.

This is the case in the computer animation and visual effects industry, which in Toronto numbers around a hundred firms, has estimated revenues of \$170-\$200 million, and employs around two thousand people (Nordicity, 2008). In Canada, 3D computer animation has largely supplanted 2D hand-drawn animation, a television staple that has now largely migrated to countries with low labour costs. Digital visual effects (digital VFX) are typically used as photorealistic extensions of live-action cinematography to create new scenes, characters, or effects, although today entirely computer-generated feature films are familiar to everyone. The computer animation/digital VFX industry services several segments of the screen industry: feature films, television shows and movies, commercials, games, mobile content, broadband and Internet content, music videos, and scientific visualization. Some firms in the post-production sector also provide digital VFX services.

Most of the computer animation/digital VFX companies in Toronto are small or medium-size firms, hiring staff on a project-by project basis, although the city also has several larger firms with in-house studios that produce programming for the TV market and outsource some of their production tasks. Computer animation/digital VFX firms in Toronto have provided special effects and scenes for many very well-known films and television shows. An illustrative list of firms and shows to which Toronto firms have made contributions includes CORE Digital Pictures (*Resident Evil: Apocalypse*, *Blade 2*, *X-Men*, *The Tudors*, *The Wild*), Mr X Inc. (*Tron: Legacy*, *Resident Evil: Afterlife*, *Scott Pilgrim vs. the World*, *Amelia*, *Whiteout*, *Eastern Promises*), Copperheart Entertainment (*Ryan*, *Splice*), Rocket Science (*Chloe*, *Saw 3D*, *Everest*), Intelligent Creatures (*Day of the Triffids*, *Piranha 3D*, *Babel*), Coptor (*The Cassandra Syndrome*), and Starz Animation (*9*, *Gnomeo and Juliet*). The latter firm is an affiliate of a U.S. entertainment conglomerate that recently expanded into digital VFX in Toronto. As is clear from the titles, digital effects are now used very widely outside the science fiction and children's genres where they originated, and they have become so extraordinarily realistic that viewers frequently are unable to distinguish artifice from reality.

The production of a fully animated digital feature film represents the highest degree of firm-level capability in the computer animation/digital VFX industry. It is a very complex and expensive process requiring substantial infrastructure and expertise. The production process requires specialized proprietary software tools for management of workflow, pipelines, projects, and tens of thousands of digital content "assets". The industry-standard software animation tool Houdini is produced by Toronto-based Side Effects Software.

Talented digital effects workers provide the key technical and artistic capabilities. The production process involves story designers, computer model builders, software developers, animators, texture painters, and technical specialists in computer networking, storage and communications. Many VFX/animation workers in Toronto received their training at such leading animation schools as Sheridan College. Toronto's reputation as a digital animation hotspot was enhanced when the computer-animated documentary *Ryan*, produced at Sheridan College, won an Academy Award for best animated short in 2004.

A typical digital feature film production lasts 2 years, employs 300 people, utilizes 1000 or more computer processors and upwards of 100 terabytes of on-line storage. It takes between 1500 and 2000 shots, each of which is from two to five seconds in duration, to complete a feature film. Every frame and every element in it must be created from scratch, and every element must be consistent in color, texture, shape, and opacity. A feature film is made of 115,000 individual pictures, often comprised of huge files, and data processing, storage, network, and communications requirements are substantial and critical.

The principal firm in Toronto with the capability to produce all-digital feature films was CORE Digital Pictures, the city's largest independent animation studio, which suddenly closed its doors in March, 2010, unable to raise cash from private or public sources. The reasons for the failure of this firm have not been disclosed, but three notable California-based computer

animation/digital VFX firms also recently closed their doors (CafeFX, Asylum VFX, and ImageMovers Digital), citing poor economic conditions. The computer animation/digital VFX sector has become volatile because capabilities are coming on stream around the world, and fast broadband connections allow animation and VFX work to be parsed into tasks and distributed widely among subcontractors. Since labour represents about half the cost of a digital feature production, outsourcing animation/VFX production to low-cost labour locations is economically attractive. This is exacerbating price-based competition among providers of digital animation/VFX services around the world, and is spurring incentive-based competition among host jurisdictions. For example, the Ontario government advanced \$23 million to Starz Animation Toronto in 2009 to help the firm create and retain over 250 jobs in the province. Part of this advance went toward the production of the animated feature film *Gnomeo and Juliet* (2011), which was released in 3D and distributed by Toronto-based E1 Entertainment.<sup>8</sup>

The volatility of the animation/visual effects industry, which is structured mainly as a service industry, shows that it is not enough for a city like Toronto to have a co-located leading training institution, a leading software provider, leading digital VFX firms, and a leading distributor. A sustainable and competitive media cluster also requires a cohort of indigenous firms that can successfully create and commercialize digital products for which they retain intellectual property rights: that is, they need to develop and successfully exploit a rights management business model.

*Product spillovers: innovating and commercializing 'convergent' transmedia properties*

Product spillovers occur when goods and services “increase demand for complementary goods in other sectors” (Chapain et al., 2010: 25). Product spillovers are common in media domains. Often they involve a firm and its partners extending intellectual property such as a brand, characters, or a narrative into merchandising of toys, games, food, clothing, or live events. The latter is the preferred business model in the children's screen entertainment industry, although it is regarded as too risky and complex for small firms to engage in alone (Davis, Vladica, and Berkowitz, 2008). Said the executive of one Toronto-based children's production firm, “merchandising is a very, very inexact science, part of rights management; it is a combination of inexact science and lottery”. Nevertheless, this company “will not produce something that does not have merchandising potential”. In Toronto a network of firms and organizations specializing in entertainment for kids has emerged, encompassing firms in digital media, film and television production, games, toys, education, and live events.

In an example of path creation in transmedia, approximately two dozen Toronto firms are developing highly specialized capability to create cross-platform content for film, television, and mobile screens. Movement of content from one medium to another is not new, of course –

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<sup>8</sup> Starz Animation Toronto was recently rebranded as Arc Productions after being acquired by a private consortium of Canadian investors in April 2011.

books become movies, songs are recorded and broadcast, theatrical plays can end up on television, and TV shows can circulate on websites and mobile devices – but the emergence of digital production and distribution platforms makes transmedia (crossplatform) strategies compelling.

The advent of transmedia properties and transmedia audiences obviously creates dilemmas for small and medium-size production companies. The ability to develop and implement business models that work across platforms provides economies of scope among transnational and national media conglomerates, and is a source of competitive advantage (Aris and Bughin, 2009; Vukanovic, 2009). Also, as Jenkins (2006) points out, convergence is very much about participatory media culture. But user-generated content tends to drown out small content producers and undermine small service providers such as audio recording studios.

Small media producers engaging in transmedia strategies must create complementary media goods and services across platforms, devices, and channels, but what kinds of complementarity, and who will pay for it? In transmedia business ventures, frequently one profitable media platform subsidizes distribution on other platforms. This is currently the case with digital content, which in Canada is generally subsidized via the broadcasting system. In Toronto, profitable digital firms can be found among Web 2.0 applications developers, games developers, and advertisers, but the core of the Toronto screen content development industry still gains most of its income from television, not from products distributed on digital platforms such as the Internet or mobile media. In 2009, only around two percent of the Ontario film, television, and cross-platform interactive media industry's revenues of nearly \$900 million were generated from interactive media production (Nordicity, 2009). Of 189 firms, twenty firms were active in interactive media (generally designed in conjunction with film or television properties) and five had true transmedia capabilities – the capability to work in all three areas of film, television, and cross-platform interactive media.

Small interactive media firms behave strategically regarding their transmedia activities, which are expected to increase in economic significance in coming years. Said the executive of one highly regarded firm that produces television shows, games, animation, and interactive websites, “most of our work comes from doing interactive properties that are linked to television shows. We are dubious that interactive projects have revenue potential, but we view it as a way to grow and get a name for ourselves”. At the same time, servicing the broadcasting industry provides a competitive advantage to this firm because “we have a really good knowledge of the TV industry and how TV people think. Other companies that do what we do often come from the online gaming world, but they don't know how TV functions”. The firm's perceived advantage over competitors that focus strictly on digital gaming is that, while game creators try to create a complex and technically sound puzzle, an interactive media producer tries to create an interactive experience that works as part of a film or television story.

We noted earlier that transmedia innovation involves many kinds of extensions across media, not just interactive media. But the current technological state of the media industry has given interactive media enormous strategic significance for the Toronto media industry as a whole,



since successful transition to a converged media environment is widely regarded as a critically important step in the evolution of the Toronto media cluster. The issue, therefore, is how a screen media innovation system that is path-dependent on the established broadcast industry can create new innovation pathways yielding profitable transmedia properties. We conjecture that firms that develop internal transmedia capabilities are best positioned to discover or invent viable business models for transmedia innovation. However, it must be noted that while the development of transmedia capabilities in the indigenous screen production sector in Toronto is highly dependent on co-located pools of film, television, and interactive media technical, creative, and business labour, certain non-local factors, notably national broadcast policy, also play a determining role (Davis, 2011).

*Network spillovers: creative districts and the conversion of cultural to economic capital*

Network spillovers occur “where the mere presence of creative businesses in a given place benefits other local firms” (Frontier Economics, 2007). Most ambitious creative city initiatives favour investments in signature cultural buildings, high-profile infrastructure for cultural production and consumption, and major cultural events in the downtown core, seeking network spillovers in the form of attraction of domestic and international talent, investment, high-value added business activities, high-income local and transient cultural consumers, and domestic gentrifiers.<sup>9</sup> The best documented case of a spillover-intensive cultural district in Toronto is Queen West-Liberty Village, which encompasses art, music, screen media, digital media, and cultural consumption services, and displays the expected gentrification effects (Catungal, Leslie and Hii, 2009; Matheson, 2004; Sharpe et al., 2004).

In many respects, creative-city and creative-class initiatives are ‘symbolic policies’ (Rousseau, 2009) designed to persuade owners of financial, symbolic, or relational capital to invest in the host city. For local policymakers, the ultimate expected outcome of investments in “creative clusters and cultural scenes” is job creation and economic growth. As illustrated by the case of the Toronto International Film Festival (TIFF) and the Bell Lightbox, TIFF’s home since September 2010 in Toronto’s Entertainment District, a major cultural event can function as a catalyst in the urban growth machine, effectively converting cultural capital into economic capital, while responding to a broader range of cultural, policy, and economic interests.

Thousands of film festivals take place annually around the world. TIFF, which launched in 1976 as the Festival of Festivals, has become one of the top five film festivals in the world. It screens over 300 features and shorts during its 11-day run and attracts more than 250,000 visitors, including key industry players and film celebrities. Associated with the TIFF Group are activities that take place throughout the year: a cinémathèque, a student film showcase, a film reference library, a distribution system for Canadian and international independent films that serves 163 Canadian communities, a lecture series, special exhibits, and an annual event honouring

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<sup>9</sup> On these points see Bontje and Musterd (2009), Currid (2009), Evans (2009), Kipfer and Keil (2002), Mathews (2010), Oakley (2009), Ponzini and Rossi (2010), and Rousseau (2009).

Canadian cinema. TIFF also organizes the Sprockets Toronto International Film Festival for Children and Youth. In addition to its success within the very competitive field of film festivals, TIFF has become a well-known Toronto icon, a key component of the Toronto brand.

TIFF's stated goals can be characterized as promotion of cultural betterment through cinema by engaging audiences in ways that local cinemas, even multiplexes with their bars and game galleries, have been unable to do:

Our mission is to transform the way we see the world through the film, and TIFF Bell Lightbox is an essential means towards achieving this end. Our new building will allow us to reach many more people, young and old, from every walk of life and from every ethnicity. Film is the most accessible art form, its reach ubiquitous and its influence as a cultural force pervasive....Understanding this powerful medium is TIFF's role (Piers Handling, TIFF Director and CEO, in TIFF, 2009: 3).

A film festival and its associated activities must satisfy up to three separate constituencies whose interests and objectives do not necessarily coincide – the public, industry professionals and celebrities, and public sector partners. Many festivals cater to one or two of these constituencies, but TIFF is unusual among film festivals in that it successfully creates value for all three. As an open (curated) film festival, TIFF must attract the general public comprised of local and tourist film enthusiasts who seek a window on interesting, high quality, and novel films, as well as the “‘get-together’ ambiance of festivals, which are convivial, party-like meeting places for movie lovers, and opportunities to encounter filmmakers” (SECOR, 2004: 4). Film industry professionals, a group comprised of directors, producers, distributors, buyers, and writers, seek three things: access to quality films, the opportunity to launch a film, and a gathering of key professionals for dealmaking purposes. Public sector partners seek to promote national films and build audiences for them, demonstrate national culture and its components, and rally the local stakeholder community (SECOR, 2004), and they require corresponding evidence of economic, social, and cultural benefits. In 2008-2009, TIFF generated economic benefits for Ontario estimated at \$162 million, including \$61 million in tax revenues (TCI, 2010).

The Bell Lightbox, located on the corner of John and King streets in downtown Toronto, is a signature architectural accomplishment in glass designed by Bruce Kuwabara of KPMB Architects, taking its place with the other downtown architectural achievements of Toronto's Cultural Renaissance: the Royal Ontario Museum, the Art Gallery of Ontario, the National Ballet School, the Royal Conservatory of Music, and OCAD University. The Bell Lightbox contains five cinemas, two galleries, three studios, administrative offices, a rooftop terrace, an open-air amphitheatre, and retail space, allowing the TIFF Group to expand its portfolio of festival and non festival activities. The opening of the Bell Lightbox in September, 2010 was heralded in the blogosphere as the coming-of-age of film festivals, “an enormous evolutionary step in the history of film festivals... a step that reflects the increasingly expansive roles festivals play in world cinema culture” (Dargis, 2010). Specifically, film festivals, with TIFF among the leaders, are ‘growing up’ “even as screens grow small” (Ibid.), becoming permanent events that offer special kinds of access to the film world unavailable to spectators in theatres, much less to

mere home DVD watchers. This entails investment in real estate and year-round operational infrastructure. An observer at the Lightbox's opening could not refrain from commenting on the "complex ballet of competing interests" that produced the Lightbox, wondering...

what exactly this new era represents. At the risk of exploiting too obvious an analogy, this new structure has become the vessel into which all manner of interested parties – festival organizers, city planners, industry participants, cineastes in Toronto and the world over – have poured their sometimes-aligned, sometimes-competing interests. (Kredell, 2010).

The process by which the Bell Lightbox emerged illustrates the competing expectations and interests regarding promotion of cinema in Toronto's cognitive-cultural economy, which does not have an economically viable indigenous motion picture industry of its own. The Lightbox was financed by contributions from government, various corporate sponsors, and many private citizens during a ten-year campaign. The most striking aspect of the Bell Lightbox is the way that it allows real estate developers and film interests to directly convert cultural capital into economic capital. The land on which the Lightbox now sits was donated by the Reitman family, whose parents emigrated to Toronto after the Second World War and operated a car wash on the site in the days when the current Entertainment District was a depressed and unattractive section of the city, and whose progeny include celebrated expatriate Canadian filmmakers Ivan Reitman (*Ghostbusters*, *Animal House*) and his son Jason Reitman (*Juno*, *Up in the Air*). The management of the building construction was donated by the notable Toronto builder-developer Daniels Corporation. The quid pro quo to induce network spillovers was the 44-story luxury condominium built by the Reitman-Daniels interests atop the Lightbox. Advertised as "one part condo, one part film festival", Festival Tower suites are named after Hollywood stars, and residents receive three year membership to the Lightbox, preferred pricing to Lightbox events, invitations to parties with film VIPs, exclusive screenings accompanied by special film guests, a special film program for residents developed by TIFF Group experts for screening in the private Festival Tower cinema, special passes, and exclusive direct indoor access to the Bell Lightbox to bypass ticket lines. The value proposition to Tower residents and investors is access to film culture's aura. The websites of the Festival Tower and its forthcoming sister property, the Cinema Tower, are cinema-themed, featuring trailers, flickering images, and ticket metaphors, communicating the invitation to "wrap yourself in the cinematic lifestyle". It is not much of a stretch to suppose that this might result in "looking out from your living room windows and seeing George Clooney on the terrace below – or passing director Ivan Reitman in your condo's front lobby" (Hanes, 2010).

This formula of combining luxury downtown real estate with the promise of physical and cultural proximity to cinema celebrities in the heart of the Entertainment District, with easy access to high-end cultural consumption in the form of theatres, musical venues, sports facilities, nightclubs, and restaurants, proved irresistible. Festival Tower became "the hottest address in town" in Toronto, which at the end of 2010 had 286 active condominium construction projects, the largest number of any North American city. Most suites in Festival

Tower were reserved long before the building was completed, and the developers are currently constructing a sister building, the 43-story, 440-suite Cinema Tower, nearby.

### **Conclusions: Toronto, innovation, and the cognitive-cultural economy**

Toronto's game plan for global competitiveness requires the city to excel as a centre of cognitive-cultural production and consumption. Cognitive-cultural economic growth offers a route towards global city status that does not depend on sheer size: "size and density are not in themselves essential to new rankings of cities in, for example, global city theory... Rather what matters is the continuing influence which the city as a socially structured space exerts in the conduct of human life" (Lloyd & Clark, 2001). Promoting the urban cognitive-cultural economy signals competitiveness and attractiveness (because the CCE is considered, among targeted footloose investors and talented knowledge workers, to represent the leading edge of production and consumption), and at the same time it strengthens the performance of the domestic CCE sector.

The realization of Toronto's growth ambitions will be determined by Toronto's ability to increase the rate of public and private investment in innovation in its cognitive-cultural economy. The city-region has maintained its status as first among equals on the Canadian domestic scene, but this status translates into runner-up status globally. In this sense Toronto's growth ambitions and potential are hampered by the political difficulty in Canada of channelling strategic public investments into the designated CCE growth areas of R&D and cultural industries in the Toronto metropolis, by the shrinking latitude for public investment in innovation due to the recent economic crisis, by voter discontent with global cultural ambitions when necessary infrastructure and services such as transportation appear neglected, and by the growing economic and social distance between players in the cognitive-cultural economy and Toronto's urban underclass.

A particularly important challenge for Toronto will be to maintain effective investments in indigenous cultural industries, most of which are facing high levels of foreign competition in the domestic market. As we have seen, much CCE innovation revolves around ICT adoption and non technological value creation, activities that are largely unrecognized by innovation policies and programs at the federal, provincial, and metropolitan levels. The Canadian TPP-inspired, R&D-based innovation policy framework has little to say about how to improve the performance of indigenous cultural industries.

To fully deploy Scott's concept of the cognitive-cultural economy for purposes of analysis, policy intervention, and improvement of management capabilities would require development of an economic and social knowledge base substantially different from that which is currently available. It would require, notably, a reliable way of characterizing, measuring, and comparing the cognitive and cultural intensity of occupations, firms, industries, and specific regional economies. Our discussion of CCE innovation identifies a further methodological challenge concerning the accurate apprehension of CCE innovation dynamics through theorization and observation of the value creation processes in CCE innovation. Much greater attention is called

for to map and analyze local and extra-local spillovers, interactions, linkages, and knowledge flows, including deeper analysis of the ways that knowledge, product, and network spillovers occur. Insofar as cognitive-cultural innovation is at the core of processes of metropolitan economic and social transformation, this is an area that calls for further comprehensive investigation.

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