19 Regional cultural economy: evolution and innovation

Al James

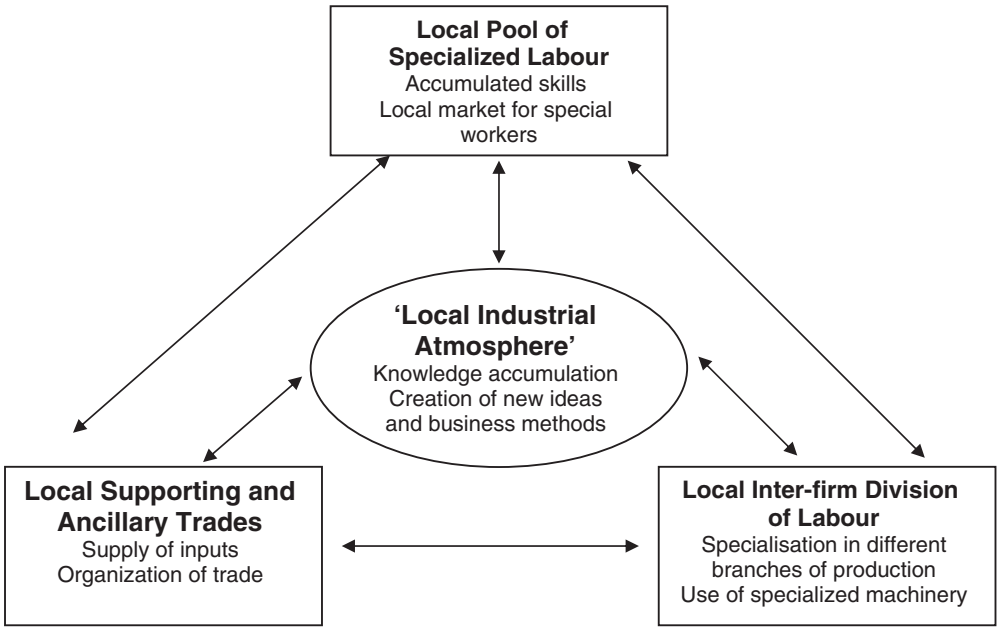
INTRODUCTION

> Increasingly the . . . cultural dimension is critical for defining and understanding the dynamics of regions. Regional economies consist of more than just aggregations, or even networks of firms, and their employees; they are also constituted by the cultural traditions and institutional structures that facilitate and regulate economic behaviour. (Wolfe, 1997, 4)

It is widely accepted that fundamental changes within advanced economies since the 1970s herald a new era of capitalist economic development. Variously conceptualized in terms of a shift to a post-Fordist regime of accumulation, the Fifth Kondratiev, the knowledge economy or the new economy, whatever the label used the emergent geography of this new order is marked by a decisive reagglomeration of production. Characteristic in their high rates of technological learning and innovation, the workings of these 'regional industrial complexes', 'new industrial spaces', or 'new industrial districts' have become a fixation for policy-makers and academics keen to explore their potential as tools to stimulate economic growth.

In particular, scholars have drawn on the work of Alfred Marshall (1890 [1952]) on nineteenth-century industrial districts, in which he theorized a 'triad of localisation externalities' that develop as firms collocate spatially (see Figure 19.1). By many producers sharing the fixed costs of and access to common factors of production – land, labour, energy, transportation and other infrastructures – Marshall argued that the supply of such resources is enhanced as capital and labour migrate to these areas to take advantage of the larger combined markets for their services. Localization externalities therefore allow small firms to enjoy the benefits of scale economies usually denied to them because of internal restrictions on growth. Updating Marshall's original ideas to contemporary economic conditions, a major research stream on regional development in the 1980s sought to explain the rise of the region in terms of the 'hard' economics of: vertical disintegration of production and a complex interfirm division of labour; the formation of external economies of scale and scope; dense networks of 'traded' input–output linkages; and the growth of a local institutional infrastructure of specialized services and distribution networks. Indeed, the current widespread policy appetite for the latest version of this mode of thinking – Michael Porter's well-known 'cluster' concept (see for example Porter, 1990, 1994, 1998) – underscores the continued relevance of Marshallian external economies for understanding contemporary regional dynamism.

Developing alongside these economistic variants of neo-Marshallian regional theory, however, and gaining considerable momentum in the early 1990s, there has emerged an alternative research stream within the regional industrial development literature that moves beyond a focus on 'hard' agglomeration economies and 'traded' material linkages



Source: Martin and Sunley (2001, 7), based on Marshall (1890 [1952], Book Four, Ch. 10).

Figure 19.1 Marshall's triad of external economies of industrial localization

to explore how 'untraded' socio-cultural characteristics of regional industrial agglomerations foster and support (and in some cases constrain) learning and innovation, and hence economic growth and development (see Storper, 1995a; MacKinnon et al., 2002). This focus on the 'cultural economy' of learning and innovation in regional industrial systems is itself part of a broader 'cultural turn' in the social sciences during the 1990s which rejected the ontological binary of 'culture' and 'economy' as self-determining, discrete sets of institutions, each with their own rationalities and conditions of existence (see Amin and Thrift, 2004; Crang, 1997; Sayer, 1997). Instead, scholars have embraced a range of more fluid and hybrid conceptions of 'the economic' that emphasize its mutual constitution by, and hence fundamental inseparability from, 'the cultural'. Rooted in earlier analyses of the socio-cultural foundations of regional development in north-east and central Italy through the 1970s and 1980s (see, for example, Brusco, 1986; Pyke et al., 1990; Trigilia, 1990), there is now an expansive interdisciplinary regional research literature spanning economic geography, economic sociology, regional science and evolutionary economics in which scholars have analysed the importance of regionally specific cultures in shaping local knowledge production, employment relations, industrial adaptation and patterns of regional economic development.

Specific research questions within this literature include: how do different regional cultures in otherwise similar regional agglomerations of 'hard' economic institutions give rise to different patterns of economic growth and development? How do cultural norms, values, beliefs and taken-for-granted assumptions facilitate and constrain processes of knowledge production, learning, innovation and entrepreneurship within regional

economies? How are these regional cultures (re)produced over time? And how far is it possible to realign regional cultures in economically less successful regions through deliberate policy interventions designed to emulate the success of more dynamic regional economies elsewhere? In tackling these questions, researchers have problematized and reformulated Marshall's notion of a socio-cultural 'industrial atmosphere', encapsulated in his famous phrase 'secrets of industry were . . . in the air', in which he stressed the inseparability of industry from local society, traditions, social norms and values that are critical for economic coordination, and which arise spontaneously and unplanned (Scott, 2000, 107). Indeed, there is now a strong consensus that it is simply impossible to explain the continuing growth advantage of some regional economies over others if we fail to take into account the ways in which firms' knowledge production activities are culturally constituted (Storper, 1997; Saxenian, 1994).

The purpose of this chapter is to offer a broad introduction to this important research stream concerned with the regional cultural economy of learning, innovation and development. The chapter begins by setting out its intellectual origins and 'founding parents'; explaining core conceptual frameworks which scholars have developed to theorize regional cultures of innovation and their growth effects; summarizing important debates around the need to 'demystify' regional culture and how to ground 'innovative milieux' empirically; and outlining some important case studies that have analysed the links between regional culture, knowledge production and regional development (specifically Silicon Valley, Boston's Route 128, Salt Lake City, Oxford's Motorsport Valley and Cuba's bioscience cluster). The chapter concludes by charting two newly emergent research agendas around gendered cultural economies of learning within high-tech regions; and a decentring of the mainstream research literature (with its almost exclusive focus on the Global North) to regional industrial systems in the Global South, in order to expose the limits of Western-centred readings of regional cultural economy, learning and development.

CORE CONCEPTS: FROM TRANSACTION COSTS TO REGIONAL CULTURAL (DIS)ADVANTAGE

The rise of culturally sensitive approaches to understanding the different factors and conditions that affect regional growth and development can be understood as a critical response to one particular economistic variant of neo-Marshallian regional development theory, known as 'the Californian school'. Drawing on empirical work in California's Orange County in the 1980s, Allen Scott and his colleagues argued that the success of regional industrial agglomerations was ultimately a function of the transaction cost reductions accrued to firms as a function of their close proximity (for example Scott, 1986, 1988; Storper and Walker, 1989). Their argument was threefold. First, instability of markets and an accelerated pace of technological change are met by a disintegration of the production process, and hence a deepening in the social division of labour. This then allows firms to maximize the benefits of specialization and to minimize exposure to risks of overcapacity, labour-force hoarding and dangers of technological lock-in, and hence to become more flexible. Second, as interfirm transactions become more important, so the costs of transport, communication, information exchange, search and

scanning become more significant. The increased costs associated with increased external transactions are argued to create a 'spatial pull'; that firms will seek to agglomerate to minimize the costs of those transaction costs through external economies of scale. Third, spatial agglomeration supports in turn the growth of specialized institutions, which further lower transaction costs and increase economic efficiency. These include a myriad of specialized consulting, market research, public relations and venture capital firms, which provide technical, financial and networking services which firms cannot afford individually.

In response, critics argued however that we cannot only theorize the development of regional industrial agglomerations in terms of reductions in the unit costs of production within a given technology (see, for example, Martin and Sunley, 1996; Storper, 1995a). There are three main overlapping critiques. First, the argument that the institutional forms that prevail within these regions are those that deal most efficiently with reducing transactions costs is criticized as functionalist: the existence of all regional economic and social institutions cannot be assumed to be predicated on the minimization of transaction costs per se (Yeung, 2000). Second, critics argued that firms are much more than mechanistic production functions or simple expressions of an abstract capitalist, profit-maximizing imperative. To reduce the inner workings of the firm to a black box in this way says little of how and why entrepreneurs do (or do not) create companies, enter markets, interact with one another or take risks. Critics instead highlight the need to analyse the multiple and competing economic, social, cultural and political motives and logics underpinning firms' strategic behaviour (see Schoenberger, 1994, 1997). And third, critics argued that external economies, cost–price benefits to firms, and 'traded' input–output links as structures in themselves cannot explain the ongoing learning and innovation capacity of particular regional industrial economies, nor why some remain competitive and continue to grow whilst others do not. Arguably, it was Annalee Saxenian's (1994) seminal work on the divergent regional economic growth trajectories of California's Silicon Valley and Boston's Route 128 through the 1980s that demonstrated this last point most explicitly (see also discussions by Gertler, 1995; Oinas, 1995; Storper, 1995b).

By the early 1980s, following periods of sustained economic growth through the 1970s, Silicon Valley and Route 128 both faced economic downturns, primarily due to the decentralization of routine assembly operations to other regions and the loss of commodity chip markets to the Japanese. Through the 1980s, however, while Silicon Valley rebounded with a new generation of computer and semiconductor start-up companies, impressive technological performance and stabilized world market shares in semiconductors, Route 128 floundered.[1] In short, transaction cost analyses could not explain this divergence. What was it about these two similar regional industrial agglomerations of 'hard' economic institutions, both theoretically gaining the transaction cost reductions that stem from firms' spatial agglomeration, that had produced regional economic growth and advance in Silicon Valley yet relative regional decline in Route 128?Whilst not denying the reality of transaction cost reductions, Saxenian argued that the divergent performance of these two otherwise similar regional economies over the late 1980s and early 1990s demonstrated the crucial importance of local cultural determinants of regional industrial adaptation and economic growth. While these had previously been acknowledged as merely superficial disparities between 'laid-back' California and

the more 'buttoned-up' East Coast, Saxenian argued instead that variations in industrial cultures across the two regions fundamentally shaped local patterns of learning, entrepreneurship, knowledge production and regional adaptability:

> The experience of Route 128 and Silicon Valley in recent decades suggests that there are important regional sources of competitive advantage. Their differences in performance cannot be explained by approaches that view firms as separate from the social structures and institutions of a local economy. Variations in local institutions and corporate forms shape regional capacities for adaptation . . . These institutions shape and are shaped by the local culture, the shared understandings and practices that unify a community and define everything from labour market behaviour to attitudes towards risk taking. (Saxenian, 1994, 6–7)

In Silicon Valley, a distinctive regional Californian counterculture – characterized by an openness to experimentation, the glorification of risk-taking, an acceptance of failure as a learning process, rapid change as the norm, a rejection of traditional social hierarchy, and greater loyalties to transcendent technologies than individual employers – is argued to have underpinned a regional, decentralized, network-based industrial system of learning. Interfirm flows of embodied information, ideas and know-how through informal social networks, hobbyist clubs, professional societies and high rates of cross-firm labour mobility helped to promote innovation and flexible adjustment among producers of complex related products, imperative under current conditions of shrinking product life cycles, fragmenting markets and an intensification of global competition (Saxenian, 1994; cf. Florida and Kenney, 1990). In addition, the development of shared social identities amongst young, single male engineers around the project of advancing new technologies effectively blurred the work–home boundary and enabled a regularity of long unsocial work hours, and the completion of large workloads in short periods of calendar time.

In contrast, a traditional conservative East Coast business culture in Route 128 – characterized by strong civic ties, self-sufficiency, risk-aversion, a stigmatization of failure, respect for traditional social hierarchies, stability and corporate loyalty – is argued to have sustained relatively integrated corporations; a strict separation of work and social life; 9–5 work hours; lower levels of interfirm networking and labour mobility; an isolation of producers from external sources of know-how and information; and hence lower rates of regional learning, innovation and economic growth. The strength of Saxenian's analysis is that she is able to control for industrial sector, products (in general terms), historical period, position in the business cycle, political events, and nation-state, since these are shared in common between the two regions.[2] Her evidence base is also impressive: repeat interviews over the course of a decade with over 150 local entrepreneurs, chief executive officers (CEOs), vice-presidents (VPs), venture capitalists and other industry-watchers.

In a nutshell, Saxenian showed persuasively and originally how regional processes of entrepreneurship, innovation, adaptability and growth in the knowledge economy are based on a whole series of socio-cultural understandings and practices that go far beyond the basic factors of production outlined by the narrow economism of the Californian school. She also drew attention to the reflexive, mutually constitutive nature of the relationships between: local shared cultural understandings; industrial structure; observed business practices; and regional institutions, including public and private organizations

such as universities, business associations, local governments, professional associations and other forums which sustain patterns of social interaction and knowledge exchange in the region (Saxenian, 1994, 8).

CONCEPTUALIZING THE REGIONAL CULTURAL ECONOMY OF INNOVATION AND GROWTH

Building on Saxenian's earlier study of regional cultural (dis)advantage, other scholars have developed a wide range of theoretical frameworks and conceptual tools to help advance our understanding of the significance of 'untraded' socio-cultural and relational characteristics of regional industrial systems, and their role in enabling and constraining processes of learning, innovation and growth. As part of this, researchers have drawn heavily on the work of four key figures.

First, scholars have drawn on the work of Karl Polanyi on 'embeddedness'. In his book *The Great Transformation* (1944) Polanyi rejected the then dominant view of the economy as 'natural', pre-given, self-regulating and inevitable in form, instead arguing that markets are socially constructed and governed. Second, Polanyi's ideas were later reworked and reintroduced to social science in the mid-1980s by the sociologist Mark Granovetter, with 'embeddedness' broadly defined as the set of concrete social relationships between economic and non-economic actors (individuals as well as aggregate groups of individuals), which in turn create distinctive patterns of constraints and incentives for economic action and behaviour (see Granovetter, 1985; Zukin and DiMaggio, 1990; Oinas, 1997; Hess, 2004). Third, in conceptualizing the socio-cultural construction of regional industrial systems, scholars have also drawn on the earlier (1919) work of Thorstein Veblen (dubbed 'old institutionalism'). Here, 'institutions' are interpreted as socio-cultural repertoires, routines and conventions that provide cognitive frameworks or templates of meaning through which economic identities and particular actions and preferred behaviours are legitimated. As such, they are an important factor in determining the path-dependence of regional economic trajectories, because they serve to transmit knowledge, attitudes and values from one generation to the next (Martin, 2000, 81–2). And fourth, scholars have also married neo-Marshallian ideas with a reformulation of Joseph Schumpeter's writings, particularly his famous (1934) work *The Theory of Economic Development*. Schumpeter argued that economic growth requires innovation: that is, the generation of higher-quality products at lower unit costs than had previously been available; and that its pace and direction are affected by the institutional framework in which it occurs (Wolfe and Gertler, 2001). Neo-Schumpetarian accounts therefore emphasize the locally-based determinants of entrepreneurship and technological change, and how different institutional environments and institutional arrangements differently promote and constrain innovation and growth (Martin, 2000, 80–81).

Differently incorporating these earlier ideas, a series of overlapping concepts have been developed to deal with different dimensions of the regional cultural economy – innovation and growth nexus. Here I briefly introduce three such core concepts (but see Storper, 1995a and MacKinnon et al., 2002 for fuller reviews). First, the concept of the 'innovative milieu' has been particularly prominent, developed by the GREMI group, an association of principally French–Italian–Swiss regional economists, centred in Paris[3]

(for example Camagni, 1995; Capello, 1999; Maillat, 1995). 'Innovative milieux' are defined as: 'the complex network of mainly informal social relationships on a limited geographical area, which enhance the local innovative capability through synergetic and collective learning processes' (Camagni, 1991, 3). Here, then, innovation is grounded in intergenerational transfers of know-how, imitation of successful managerial practices, interpersonal face-to-face contacts, formal and informal cooperation between firms, and the circulation of tacit knowledge (ibid.). A shared social and cultural environment is also argued to enable economic actors to process and use imperfect information more effectively by reducing uncertainties when searching, screening, transcoding and selecting information, and therefore to learn and innovate more effectively (for example Keeble and Wilkinson, 1999).

Notions of a socio-cultural 'innovative milieu' overlap with a second core concept in regional cultural economy: that of the region as a 'nexus of untraded interdependencies' or 'relational assets' as articulated by Michael Storper. These ideas take as their focus a set of shared qualitative rules or socio-cultural 'conventions' which regulate interactions and allow economic actors to understand, interpret and effectively use knowledge; to deploy it in economically useful ways; and hence ultimately to make learning possible within the region (see Storper and Salais, 1997). Specific conventions include accepted norms and values around, for example, class hierarchy, reciprocity and trust, cheating, association, social closure, labour, political exchange, voice and the common good (Storper, 1997, 14), and for Storper these are territorially bounded in 'regional worlds of production'. The central argument here is that: 'agglomeration does not ensure learning or determine its content. [Rather] the use and development of information in such a way that technological learning takes place has to do with the qualitative behaviours of agents in a network' (Storper, 1997, 135). Storper argues that it is therefore difficult to explain the continuing competitive advantage of certain regional economies over others if their cultural conventions, rules of behaviour and explicit accord are not taken into account.

Strongly overlapping with notions of 'innovative milieu' and 'untraded interdependencies', a third core concept within the regional cultural economy literature is that of 'institutional thickness' (Amin and Thrift, 1994, 1995), which stresses the commonly available and institutionalized nature of regional assets which are argued to enhance firm-level capabilities and stimulate 'a diffused entrepreneurship'. Institutional thickness is comprised of four main elements: (1) a strong local presence of 'hard' institutional arrangements (firms, business associations, financial institutions, unions, educational institutions, and so on); (2) high levels of interaction amongst those institutions based on networking, cooperation and exchange; (3) well-defined structures of coalition-building and governance to avoid institutional conflict; and (4) a strong sense of place or belonging, supporting mutual awareness of a common enterprise or 'industrial purpose'. Institutional thickness, then: 'refers, at least potentially, to locally generated cultures serving as a base for economic activity and economic innovation' (Amin and Thrift, 1997, 154).

These three overlapping frameworks therefore have varying emphases: for example, on the role of non-firm institutions and organizations (for example government, training organisations, development agencies, universities) in shaping regional innovative capacity versus the role of networking and intensity of interaction between individual

firms. Nevertheless, all three are united in their recognition of regional processes of learning, innovation, development and growth as culturally, relationally and institutionally embedded. Reinforcing this consensus, other scholars have explored how shared commonalities of language, codes of communication, conventions, norms and personal knowledge of each other based on a past working history all help to create a sense of trust upon which effective interfirm cooperation is predicated, given the scope for opportunism offered by the necessary incompleteness of contracts in an uncertain post-Fordist climate of demand (see for example Lorenz, 1992; Gertler, 1995). In combination, these various links and relationships are increasingly regarded as the intangible essence of the competitive firm and the competitive region: a socio-cultural 'glue' which holds dynamic regional economies together beyond mere specialization and interlinkage and which maintains their distinctive mix of competitive and cooperative interfirm relations (Brusco, 1990; Pyke and Sengenberger, 1992; Malecki, 1999).

CRITIQUE AND DEBATE: DEMYSTIFYING THE LINKS BETWEEN REGIONAL 'CULTURE', INNOVATION AND ECONOMIC GROWTH

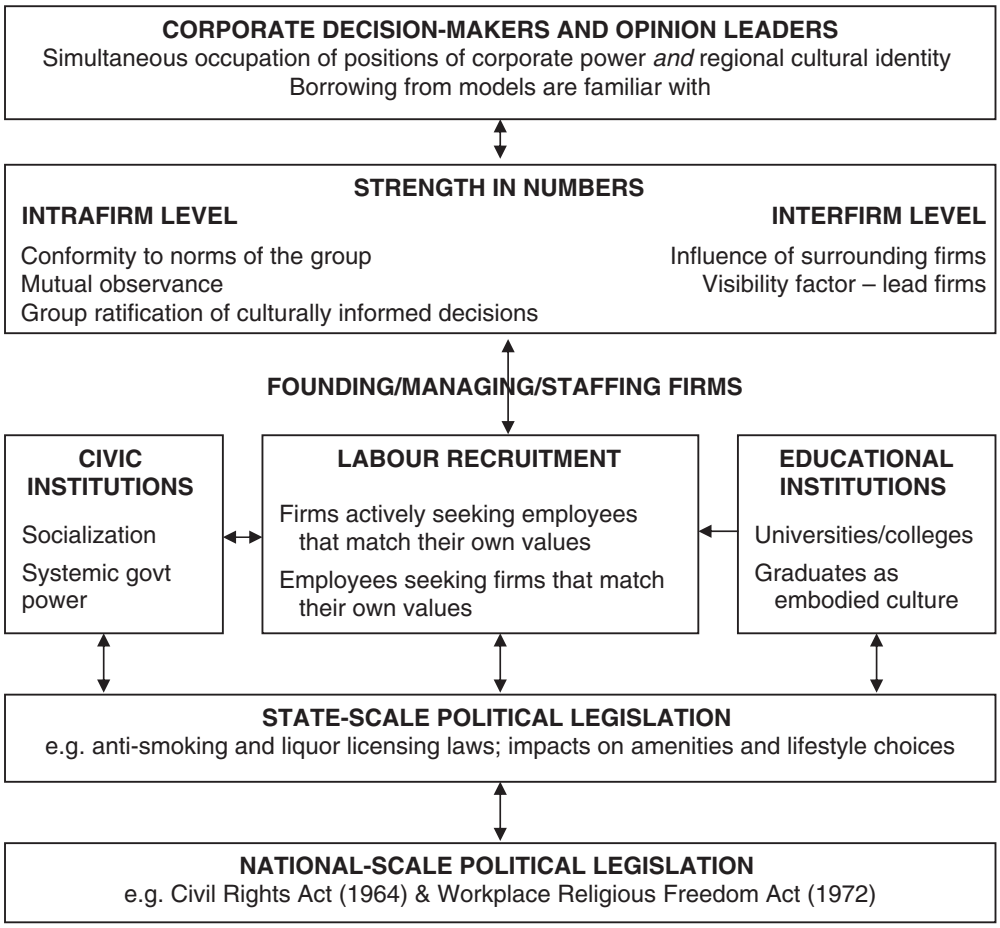
However, despite the consensus that distinctive regional 'cultures' play a vital role in facilitating processes of social learning and economic growth, the origins of these cultures remain somewhat obscure (Wolfe and Gertler, 2001, 16). Notwithstanding the plethora of conceptual frameworks as introduced above, and a diverse range of empirical case studies, the exact nature of the mechanisms and processes by which regional culture structures promote innovative activity more successfully in some regions than in others are still far from clear (Asheim, 1996). There is often circularity: that innovation occurs because of the presence of a certain cultural 'milieu', and that cultural 'milieux' are what exist in regions where there is innovation (Storper, 1997). Indeed while it is Saxenian who takes us furthest away from this unsatisfactory state of affairs, even she stands accused of not thoroughly establishing the causal links between the competitive culture she describes and the successful growth of Silicon Valley as a regional economy (see Markusen, 1999, 879). It is in this context that Meric Gertler has called for a demystification of regional 'culture' in studies of contemporary economic relations (see Gertler, 1997, 48), and to counter tendencies within the literature to dehumanize and misrepresent regional culture 'as something ethereal and eternal, divorced from historical material practice' (Sayer and Walker, 1992, 178).

One excellent body of research that has sought to demystify the regional cultural economy of learning, innovation and growth is that developed by Nick Henry and Steve Pinch on Oxford's 'Motor Sport Valley'. This world-leading regional agglomeration of small firms clustered within a 50 mile radius around Oxfordshire is where three-quarters of the world's single-seater racing cars are designed and assembled, and the vast majority of the most competitive Formula One racing cars are designed and assembled (Pinch and Henry, 1999, 816). Rejecting narrow economistic explanations that explain the sustained growth of this region as a function of external scale economies, this work instead seeks to ground the rather esoteric socio-cultural notions of 'innovative milieu' and 'untraded interdependencies' by documenting empirically the everyday activities, human

interactions and causal agents through which tacit knowledge and cultural conventions (about how to construct the 'best' racing cars in the world) are generated and disseminated within this world-leading 'regional world of production'. In summary, Henry and Pinch trace the embodied 'churning of knowledge' across firms through: the rapid and continual transfer of designers, engineers, managers and drivers (every 3.7 years on average); high rates of firm death and new firm formation in which key personnel are 'recycled'; interlocking company directorships; information 'leakage' through links with component suppliers; and the dissemination of new practices and technologies through gossip, rumour and mutual observation in pit lanes, on test tracks and at race meetings, encouraged by large numbers of specialist magazines and extensive press and TV coverage (see Henry et al., 1996; Henry and Pinch, 2000).

Other work has also sought to elucidate more clearly the embodied mechanisms and everyday practices through which locally dominant socio-cultural norms, values, beliefs and conventions come to shape routine intra- and interfirm learning and innovation behaviours, and the effects of this 'cultural embeddedness' on firms' observed performance. James's (2005, 2007) empirical analysis of the regional high-tech industrial agglomeration centred on Salt Lake City, Utah offers some useful insights here. This research explores how a locally dominant set of regional cultural norms, values and evaluative criteria associated with the Church of Jesus Christ of Latter-Day Saints (informally, the 'Mormon Church' of which over 75 per cent of Utah's general population are members) come to inform the behaviour of local computer software firms. Based on a regional survey of 105 software firms, 20 corporate case studies and 100 in-depth interviews, this research documented how Mormon ethics of mutual obligation, self-sufficiency, anti-debt and prioritization of family over work in some ways support firms' abilities to access external sources of information, knowledge and competencies. One example concerns enhanced levels of cooperation between similarly Mormon-founded and -managed firms premised on cultural trust rooted in a common cultural background. At the same time, however, these same Mormon cultural norms and values also generate self-identified constraints on firms' innovative capacities: for example as a function of reduced weekly work hours in the context of time-based competition; and an unwillingness to seek external debt finance for growth (see James, 2007). Importantly, this work also measured the consequences of this cultural embedding for firms' overall performance across a series of innovation and growth metrics.[4] Controlling for age, the analysis documented that for four of the five performance metrics used, the Mormon-founded and -managed firms tended to perform less well than their non-Mormon counterparts, as a function of their cultural embedding in the region (see James, 2005).[5]

The causal mechanisms through which these cultural influences on firms' learning and innovation behaviours and overall performance are (re)produced on an everyday basis are shown in Figure 19.2. As identified through the Utah case, the major mechanism centres on members of a particular regional culture who also occupy positions of power within local firms, and who have significant influence on the opinions and behaviour of others. These include firms' founders, managers and other opinion leaders. Fundamentally, because what the firm understands itself to be is produced through the actions of its employees, the cultural identities and commitments of these key individuals are closely entwined with (although not identical to) corporate identities and commitments (Schoenberger, 1994, 1997). As such, regional cultural values and conventions



Source: James (2007, 409).

Figure 19.2 The mechanisms through which locally dominant cultural norms, values and beliefs inform worker and firm behaviour

come to inform decision-making processes, corporate strategy and observed behaviour, through definitions of what has value and what does not. Fundamentally, however, culture is a group property and as such, what counts in terms of cultural values limiting firm behaviour is not only whether the firm's decision-makers embody those values, but whether those values are ratified by the wider work group and accepted by the majority as a valid basis for action. This second 'strength-in-numbers' mechanism also includes everyday processes of conformity to the group, mutual observance and peer pressure.

Reinforcing these effects are a series of secondary reinforcing mechanisms involving: (1) culturally motivated job search and labour recruitment practices, in which firms seek employees that match their existing corporate culture, and employees seek firms that match their own personal values; (2) educational and skilling mechanisms, in

which graduates as embodied culture take their education institution's values, attitudes and norms into which they have been socialized to the firms that subsequently employ them; (3) programmes administered by civic institutions that maintain a high degree of social control over members' sense of identity and behaviour patterns; and (4) local, regional and national legislation that strengthens the power of the employer vis-à-vis the employee, or which increases employers' responsibilities to accommodate their employees' particular cultural lifestyles in the workplace.

The complex cultural economy of learning and innovation within these firms is therefore not pre-given or static, but continually remade over time, via this set of concrete mechanisms. This is not to argue that regional culture mechanically or rigidly determines worker and firm behaviour, but rather that it structures the material and cultural resources that enable and constrain the learning behaviours and actions of individuals and the firms in which they work. And because these regionally culturally inflected patterns of corporate behaviour are often common across multiple firms in the region, it is therefore possible to identify regional industrial cultures, and thereby move beyond the somewhat all-encompassing notions of 'regional culture' that characterized some earlier studies:

> Why are these distinctions important? Because . . . it helps us to understand firms as actors in regional development: as actors having to operate in – and at least partly having to accept as a given – a pre-existing regional culture, but also as actors that within that wider culture create their own internal organizational cultures and participate in the formation of a regional industrial culture that, in its turn, supports their operation. (Oinas, 1995, 202–3)

Finally, in tracing the origins of the spatially variable sets of cultural norms, values, beliefs and attitudes that come to define firms' learning and innovation behaviours, recent studies have also sought to overcome earlier tendencies within the regional learning literature to sideline extra-local structures at the national and international scales (see MacKinnon et al., 2002; Markusen, 1999). In so doing, they have avoided a partial view of the structures and forces shaping 'regional' processes of innovation and learning, based on a misplaced conception of regions as 'closed systems' or mere 'containers of intangible assets and structures' (Yeung, 2005, 47; see also Bathelt et al., 2004; Bunnell and Coe, 2001). A useful example here is the recent work of Meric Gertler on cultural conflicts between German producers and Canadian users of advanced industrial manufacturing technologies around purchasing practices, contracting procedures, training and labour practices, operating manuals and service expectations. This work highlights the role of national institutional and regulatory structures in reproducing regional cultural 'differences in expectations, characteristic workplace practices and norms, attitudes, managerial routines, and transactional behaviours – in short, what appear to be substantially different industrial or business "cultures" in North America and Germany' (Gertler, 2004, 81). The economic consequence of these cultural differences was a series of misunderstandings, disappointments, conflicts and, in some cases, termination of the relationship between technology producer and user. In a similar vein, Sadler and Thompson (2001) have explored the ways in which national institutions of organized labour also contribute to the formulation, maintenance and dissolution of regional industrial cultures. Their analysis focuses specifically on the activities of the Iron and Steel Trades Confederation in Teesside, northeast England, and how nationally

led centrist labour politics came together with local paternalistic capital–labour relations and localistic forms of self-identification to create a distinctive regional industrial culture. In so doing, they also open up contemporary debates around regional cultural economies of learning and adaptability to old industrial regions.

EMERGING RESEARCH: DIVERSE REGIONAL CULTURAL ECONOMIES OF LEARNING AND INNOVATION

Research over the two decades to 2010 has therefore reinterpreted Marshall's original speculations about 'industrial atmosphere' to emphasize the socio-cultural foundations of industrial organization and corporate behaviour that are critical to understanding learning and innovation processes within regional economies, and hence regional economic development. In addition to the work reviewed above, a series of newly emergent research streams are currently extending ideas of regional cultural economy in exciting new directions. Motivated by the dramatic increase in female labour force participation rates that has accompanied the transition to the new economy, one new research stream explores the gendering of innovation and learning within regional industrial systems. Building on Doreen Massey's earlier analysis of the gendering of organizational cultures in high-tech firms – or what she terms masculinized 'high-tech monasteries' – in Cambridge (Massey, 1995), Gray and James (2007) have examined the implications of such cultures for firms' capacities to access, assimilate, reconfigure, transform and apply external sources of new knowledge and competencies to commercial ends.[6] Key dimensions of this include: the routine difficulties experienced by female professionals in articulating their ideas and making their voices heard relative to male colleagues; and the constraints imposed by gendered norms around parenting in which women assume the majority share of household care and hence find it more difficult than working fathers to engage in after-work networking activities of tacit knowledge transfer (for example, after-work socializing, and attendance at conferences, workshops and seminars). Gray and James argue that these – and other – gendered constraints significantly limit female information technology (IT) workers' abilities to contribute to the kinds of routine activities widely theorized to underpin learning and innovation within and between firms in high-tech regional economies.

Building on this work, subsequent comparative research on gendered work–life conflict amongst IT workers in Cambridge and Dublin has explored how worker uptake of a preferred set of firm-provided 'work–life balance' (WLB) arrangements (particularly, flexitime, teleworking and compressed work weeks) in turn enhances firms' innovative capacities (see James, 2009). Based on a cross-regional survey of 150 IT companies (with combined employment in Cambridge and Dublin of 8068 workers), 54 per cent of managers identified 'an improved corporate environment for learning and creativity' as a consequence of their WLB provision, consistent with measured improvements in firm performance (productivity, revenue growth, workforce diversity) over the same time period (2004–07). In addition, this work has also documented gendered patterns of cross-firm, embodied knowledge transfer in response to uneven WLB provision, and their mediation by different labour market intermediaries, such as GirlGeeks and Women in Technology. Of 162 highly qualified, female IT technical workers surveyed in Cambridge

and Dublin, one-third identified 'poor WLB provision' in their previous company as a very important reason for leaving (push); and two-thirds identified 'better WLB provision' as a very important reason for moving to their current company (pull) (see James, 2009). These figures are particularly significant, given average company tenures of 3.5 years within this cohort. This research stream also extends to the US. Most notably, Chris Benner's (2003) work on the role of female-dedicated labour market intermediaries in facilitating the diffusion of female expertise, skills and knowledge in Silicon Valley highlights further the crucial role of female cross-firm learning communities in promoting knowledge exchange and economic growth within high-tech regional economies.

In addition to this emerging focus on gender, a second new stream of research on regional cultural economies of innovation is concerned with decentring the traditional focus of academic analysis to non-Western regional economies in the Global South (see Murphy, 2008; cf. Park and Markusen, 1995). One important study here is Simon Reid-Henry's (2008) analysis of culturally embedded innovation processes in Cuba's 'Science Pole', which transposes the study of high-tech regional cultures to a developing-world and socialist country context. The study explores the particular relationship between state socialism and local ethics of improvisation (known locally as '*aprovechando*'), conduct of the self ('*consagración*'), and glorification of risk-taking in shaping the research activities of local biotechnology companies. Cuba's 'experimental milieu' was able to replicate many features of regional economies studied in the Global North, albeit from within a very different cultural framework (for example, Cuban scientific research was closely supervised by the state, which was invested in the biotechnology project at all levels, and insisted that research took place in a manner orientated to state-defined needs). By the end of the 1980s, 42 research and production centres were clustered together in the Western Havana Scientific Pole, and their knowledge production activities generated a number of scientific and commercial breakthroughs (such as the world's first Meningitis B vaccine, a recombinant Hepatitis B vaccine and the cholesterol-busting Policosanol), and accounted for over US$100 million in annual export earnings (Reid-Henry, 2008, 1969). Into the 1990s, Cuba's biotechnology cluster continued to attract international acclaim, based on 'proof that developing countries, too, could be innovative' (Reid-Henry, 2008).

As such, this work usefully exposes and challenges a uniformity in the regional innovation literature: 'in which a specifically Western and capitalist economic culture is often uncritically established as an a priori norm for regional economic success' (Reid-Henry, 2008, 1968–9). Annalee Saxenian's latest research on cross-regional cultural economies of learning amongst internationally mobile high-tech entrepreneurs ('the new Argonauts') circulating between Silicon Valley and their home countries in China, India, Taiwan and South Korea, also challenges the Global North bias of the regional innovation literature (see Saxenian, 2005). Yet these studies are relatively few in number and much remains to be done in deepening our knowledge and understanding of the cultural economy of learning and innovation in regional economies in the Global South. Crucially, this process of 'theorizing back' (Yeung, 2007) demands that we go further than the creation of an expanded series of add-on case studies to reinterpret or affirm apparently 'universal' Western knowledge. Rather, it requires that we use those case studies to transform existing theoretical accounts and to challenge our taken-for-granted core concepts (Appadurai, 2002; Robinson, 2003).

CONCLUDING COMMENTS

In the context of the shift to a globalized, post-Fordist knowledge economy, the relationship between private sector innovation and regional growth has become a central avenue of inquiry for scholars across a range of disciplines. Building on an earlier interest in agglomeration economies and 'traded' input–output linkages, scholars have broadened their analyses to examine how 'untraded' socio-cultural, institutional and relational characteristics of regional industrial agglomerations foster and support conditions conducive to learning, innovation, entrepreneurship and growth. This chapter has provided an introductory overview to this rich body of literature, focused on the core theoretical frameworks, conceptual tools and some innovative empirical studiesthat have advanced our understanding of the regional cultural economy of learning, innovation and development. The central argument is that is simply impossible to explain fully the continuing competitive advantage of certain regional economies over others unless we take into account the shared cultural understandings, norms, values, beliefs, customs and conventions which reflexively shape the decision-making processes, social interactions and everyday learning behaviours of knowledge workers and the firms in which they work. That said, much remains to be done in demystifying these cultural–economic relationships, not least in enabling informed, culturally sensitive policy interventions in pursuit of sustainable regional economic growth.

NOTES

1. This divergence in the regional economic performance of Silicon Valley and Boston's Route 128 through the 1980s was manifest empirically in multiple ways (see Saxenian, 1994, 2). For example, while both regions employed high-tech workforces of roughly the same size in 1975, from 1975 to 1990 Silicon Valley generated 150 000 net new tech jobs, three times the number generated in Route 128 over same period. For the period 1986–90, the market value of technology firms in Silicon Valley increased by $25 billion compared with a $1 billion increase for technology firms in Route 128. In 1990 Silicon Valley-based producers exported $11 billion of electronics products compared with $4.6 billion from Route 128. And while Silicon Valley was home to 39 of the US's top 100 fastest-growing electronics corporations in 1990, this compares with only four in Route 128.
2. Nor could Silicon Valley's superior performance could be attributed to differentials in real-estate costs or wage levels. Land and office space were actually more expensive in most of Silicon Valley than in Route 128 during the 1980s, and the wages and salaries of production workers, engineers and managers were also higher. Nor were there any significant differences in tax rates between California and Massachusetts. Nor could their differences in regional performance be traced to patterns of defence spending. While Route 128 has historically relied more heavily on military spending than has Silicon Valley, and hence was made more vulnerable to defence cutbacks, Route 128's downturn began in 1984 at a time when the value of prime defence contracts to the region was still on the increase.
3. GREMI stands for Groupement de Recherche Europeén sur les Milieux Innovateurs.
4. Five metrics were employed: (i) linear revenue growth since start-up; (ii) assumed exponential revenue growth since start-up; (iii) research and development (R&D) intensity I (R&D expenditure to annual revenue); (iv) R&D intensity II (R&D employment to total employment); and (v) productivity in terms of revenue per employee.
5. The most striking differences in performance for medium-sized firms (20–99 employees) as revealed through the survey (N = 105) and in-depth case study (N = 20) datasets include: exponential growth rates, where the non-Mormon-founded and -managed firms outperform their Mormon counterparts three times over; Type I R&D intensities (non-Mormon firms two times greater). And for firms in the smaller employment category (less than 20 employees): non-Mormon firms exhibited productivity figures over two times greater than their Mormon counterparts (see James 2005, 2007 for more detail).
6. The evidence base for this study comprised: in-depth interviews with 88 employees in ten leading firms

(by 2002 workforce size and establishment revenues) in Cambridge's software and telecommunication sectors, with female and male human resources managers, chief executive officers, engineers, scientists and technologists.

REFERENCES

Amin, A. and N.J. Thrift (1994), 'Living in the global', in A. Amin and N.J. Thrift (eds), *Globalization, Institutions and Regional Development in Europe*, Oxford: Oxford University Press, pp. 1–22.

Amin, A. and N.J. Thrift (1995), 'Globalisation, institutional "thickness" and the local economy', in P. Healey, S. Cameron, S. Davoudi, S. Graham and A. Madani-Pour (eds), *Managing Cities: The New Urban Context*, Chichester: John Wiley, pp. 91–108.

Amin, A. and N.J. Thrift (1997), 'Globalisation, socioeconomics and territoriality', in R. Lee and J. Wills (eds), *Geographies of Economies*, London: Arnold, pp. 147–57.

Amin, A. and N.J. Thrift (eds) (2004), *The Cultural Economy Reader*, Oxford: Blackwell.

Appadurai, A. (2002), 'Deep democracy: urban governmentality and the horizon of politics', *Public Culture*, **14** (1), 21–47.

Asheim, B.T. (1996), 'Industrial districts as "learning regions": a condition for prosperity?' *European Planning Studies*, **4**, 379–400.

Bathelt, H., A. Malmberg and P. Maskell (2004), 'Clusters and knowledge: local buzz, global pipelines and knowledge creation', *Progress in Human Geography*, **28** (1), 31–56.

Benner, C. (2003), 'Learning communities in a learning region: the soft infrastructure of cross-firm learning communities in Silicon Valley', *Environment and Planning A*, **35** (10), 1809–30.

Brusco, S. (1986), 'Small firms and industrial districts: the experience of Italy', in D. Keeble and E. Wever (eds), *New Firms and Regional Development in Europe*, London: Kroom Helm, pp. 184–202.

Brusco, S. (1990), 'The idea of the industrial district: its genesis', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-Firm Co-operation in Italy*, Geneva: International Institute for Labour Studies, pp. 10–19.

Bunnell, T.G. and N.M. Coe (2001), 'Spaces and scales of innovation', *Progress in Human Geography*, **25** (4), 569–89.

Capello, R. (1999), 'Spatial transfers of knowledge in high technology milieux: learning versus collective learning processes', *Regional Studies*, **33** (4), 353–65.

Camagni, R. (1991), 'Local "milieu", uncertainty and innovation networks: towards a new dynamic theory of economic space', in R. Camagni (ed.), *Innovation Networks: Spatial Perspectives*, London: Belhaven Press, pp. 121–44.

Camagni, R. (1995), 'The concept of the innovative milieu and its relevance for public policies in European lagging regions', *Papers in Regional Science*, **74** (4), 317–40.

Crang, P. (1997), 'Introduction: cultural turns and the (re)constitution of economic geography', in R. Lee and J. Wills (eds), *Geographies of Economies*, London: Arnold, pp. 3–15.

Florida, R. and M. Kenney (1990), 'Why Silicon Valley and Route 128 won't save us', *California Management Review*, **33** (1), 68–88.

Gertler, M.S. (1995), 'Discussion of *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* by AnnaLee Saxenian', *Economic Geography*, **71**, 199–207.

Gertler, M.S. (1997), 'The invention of regional culture', in R. Lee and J. Wills (eds), *Geographies of Economies*, London: Arnold, pp. 47–58.

Gertler, M.S. (2004), *Manufacturing Culture: The Institutional Geography of Industrial Practice*, Oxford: Oxford University Press.

Granovetter, M. (1985), 'Economic action and social structure: the problem of embeddedness', *American Journal of Sociology*, **91**, 481–510.

Gray, M. and A. James (2007), 'Connecting gender and economic competitiveness: lessons from Cambridge's high tech regional economy', *Environment and Planning A*, **39** (2), 417–36.

Henry, N. and S. Pinch (2000), 'Spatialising knowledge: placing the knowledge community of Motor Sport Valley', *Geoforum*, **31** (2), 191–208.

Henry, N., S. Pinch and S. Russell (1996), 'In pole position? untraded interdependencies, new industrial spaces and the British Motor Sport Industry', *Area*, **28** (1), 25–36.

Hess, M. (2004), '"Spatial" relationships? Towards a reconceptualization of embeddedness', *Progress in Human Geography*, **28** (2), 165–86.

James, A. (2005), 'Demystifying the role of culture in innovative regional economies', *Regional Studies*, **39** (9), 1197–1216.

James, A. (2007), 'Everyday effects, practices and causal mechanisms of "cultural embeddedness": learning from Utah's high tech regional economy', *Geoforum*, **38**, 393–413.
James, A. (2009), 'The Impacts of Work–Life Balance on Learning and Innovation in Regional Economies', Queen Mary University of London / Economic and Social Research Council, report available at http://www.geog.qmul.ac.uk/docs/13292.pdf.
Keeble, D. and F. Wilkinson (1999), 'Collective learning and regional development in the evolution of regional clusters of high technology SMEs in Europe', *Regional Studies*, **33** (4), 295–304.
Lorenz, E.H. (1992), 'Trust, community, and co-operation: toward a theory of industrial districts', in M.J. Storper and A.J. Scott (eds), *Pathways to Industrialisation and Regional Development*, New York, USA and London, UK: Routledge, pp. 195–204.
MacKinnon, D., A. Cumbers and K. Chapman (2002), 'Learning, innovation and regional development: a critical appraisal of recent debates', *Progress in Human Geography*, **26** (3), 293–311.
Maillat, D. (1995), 'Territorial dynamics, innovative milieus and regional policy', *Entrepreneurship and Regional Development*, **7**, 157–65.
Malecki, E.J. (1999), 'Knowledge and regional competitiveness', paper presented at the International Symposium, Knowledge, Education, and Space, Heidelberg, Germany, September.
Markusen, A. (1999), 'Fuzzy concepts, scanty evidence, policy distance: the case for rigour and policy relevance in critical regional studies', *Regional Studies*, **33** (9), 869–84.
Marshall, A. (1890), *Principles of Economics: An Introductory Volume*, 8th edn, (1952), London: Macmillan.
Martin R.L. (2000), 'Institutionalist approaches in economic geography', in E. Sheppard and T.J. Barnes (eds), *A Companion To Economic Geography*, Oxford: Blackwell, pp. 77–94.
Martin, R.L. and P. Sunley (1996), 'Paul Krugman's geographical economics and its implications for regional development theory: a critical assessment', *Economic Geography*, **72**, 260–93.
Martin, R.L. and P. Sunley (2001), 'Deconstructing clusters: chaotic concept or policy panacea?' Paper presented to the Regional Studies Association annual conference, 21 November, London.
Massey, D. (1995), 'Masculinity, dualisms and high technology', *Transactions of the Institute of British Geographers*, **20**, 487–99.
Murphy, J.T. (2008), 'Economic geographies of the Global South: missed opportunities and promising intersections with development studies', *Geography Compass*, **2–3**, 851–73.
Oinas, P. (1995), 'Discussion of *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* by AnnaLee Saxenian', *Economic Geography*, **71**, 202–4.
Oinas, P. (1997), 'On the socio-spatial embeddedness of business firms', *Erdkunde*, **51**, 23–32.
Park, S.O. and M. Markusen (1995), 'Generalising new industrial districts: a theoretical agenda and an application from a non-Western economy', *Environment and Planning A*, **27**, 81–104.
Pinch, S. and N. Henry (1999), 'Paul Krugman's geographical economics, industrial clustering and the British motor sport industry', *Regional Studies*, **33** (9), 815–27.
Polanyi, K. (1944), *The Great Transformation: The Political and Economic Origins of Our Time*, New York: Farrer & Rinehart.
Porter, M.E. (1990), *The Competitive Advantage of Nations*, London: Macmillan.
Porter, M.E. (1994), 'The role of location in competition', *Journal of the Economics of Business*, **1** (1), 35–9.
Porter, M.E. (1998), *On Competition*, Boston, MA: Harvard University Press.
Pyke, F., G. Becattini and W. Sengenberger (1990), *Industrial Districts and Inter-Firm Co-operation in Italy*, Geneva: International Institute for Labor Studies.
Pyke, F. and W. Sengenberger (eds) (1992), *Industrial Districts and Local Economic Regeneration*, Geneva: International Institute for Labour Studies.
Reid-Henry, S. (2008), 'Scientific innovation and non-Western regional economies: Cuban biotechnology's "experimental milieu"', *Environment and Planning A*, **40**, 1966–86.
Robinson, J. (2003), 'Postcolonialising geography: tactics and pitfalls', *Singapore Journal of Tropical Geography*, **24** (3), 273–89.
Sadler, D. and J. Thompson (2001), 'In search of regional industrial culture: the role of labour organisations in old industrial regions', *Antipode*, **33**, 660–86.
Saxenian, A. (1994), *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Cambridge MA: Harvard University Press.
Saxenian, A. (2005), *The New Argonauts: Regional Advantage in the Global Economy*, Cambridge, MA: Harvard University Press.
Sayer, A. (1997), 'The dialectic of culture and economy', in R. Lee and J. Wills (eds), *Geographies of Economies*, London: Arnold, pp. 16–26.
Sayer, A. and R. Walker (1992), *The New Social Economy: Reworking the Division of Labour*, Oxford: Blackwell.
Schoenberger, E. (1994), 'Corporate strategy and corporate strategists: power, identity, and knowledge within the firm', *Environment and Planning A*, **26** (3), 435–51.

Schoenberger, E. (1997), *The Cultural Crisis of the Firm*, Oxford: Blackwell.
Schumpeter, J. (1934), *The Theory of Economic Development*, Cambridge, MA: Harvard University Press.
Scott, A.J. (1986), 'Industrial organization and location: division of labour, the firm, and social process', *Economic Geography*, **62**, 215–31.
Scott, A.J. (1988), *New Industrial Spaces: Flexible Production, Organisation and Regional Development in North America and Western Europe*, London: Pion.
Scott, A.J. (2000), 'Economic geography: the great half century', in R.L. Clark, M. Feldman and M. Gertler (eds), *Handbook of Economic Geography*, Oxford: Oxford University Press, pp. 18–44.
Storper, M.J. (1995a), 'The resurgence of regional economies, ten years later: the region as a nexus of untraded interdependencies', *European Urban and Regional Studies*, **2**, 191–222.
Storper, M.J. (1995b), 'Discussion of *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* by AnnaLee Saxenian', *Economic Geography*, **71**, 199–207.
Storper, M.J. (1997), *The Regional World: Territorial Development in a Global Economy*, New York: Guilford Press.
Storper, M.J. and R. Salais (1997), *Worlds of Production: The Action Frameworks of the Economy*, Cambridge MA: Harvard University Press.
Storper, M.J. and R. Walker (1989), *The Capitalist Imperative: Territory, Technology and Industrial Growth*, New York: Blackwell.
Trigilia, C. (1990), 'Work and politics in the Third Italy's industrial districts', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-Firm Co-operation in Italy*, Geneva: International Institute for Labor Studies, pp. 160–84.
Veblen, T. (1919), *The Place of Science in Modern Civilisation*, New York: B.W. Huebsch.
Wolfe, D.A. (1997), 'The emergence of the region state', paper prepared for the Bell Canada Papers 5, The Nation State in a Global Information Era: Policy Challenges, John Deutsch Institute for the Study of Economic Policy, Queen's University, Kingston, Ontario.
Wolfe, D.A. and M.S. Gertler (2001), 'Innovation and social learning: an introduction', in M.S. Gertler and D.A. Wolfe (eds), *Innovation and Social Learning: Institutional Adaptation in an Era of Technological Change*, Basingstoke: Palgrave, pp. 1–24.
Yeung, H.W. (2000), 'Organizing "the firm" in industrial geography I: networks, institutions and regional development', *Progress in Human Geography*, **24** (2), 301–15.
Yeung, H.W. (2005), 'Rethinking relational economic geography', *Transactions of the Institute of British Geographers*, **30**, 37–51.
Yeung, H.W.C. (2007), 'Remaking economic geography: insights from East Asia', *Economic Geography*, **83**, 339–48.
Zukin, S. and P. DiMaggio (eds) (1990), *Structures of Capital: The Social Organisation of the Economy*, Cambridge: Cambridge University Press.