

TOWARDS A COMPETENCE THEORY OF THE REGION

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Clive Lawson
ESRC Centre for Business Research
Department of Applied Economics
University of Cambridge
Sidgwick Avenue
Cambridge CB3 9DE

Phone 01223 335474
Fax: 01223 335768
Email: cl204@econ.cam.ac.uk

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Abstract

The main argument of this paper is that there are good grounds for extending the competence theory of the firm, or more generally the competence perspective, to analysis of the region - where the region is understood as a geographically defined productive system. The relevance of the perspective to regional study follows from the characterisation of both regions and firms as ensembles of competences that emerge from social interaction. Attention is drawn to an identifiable (but rarely acknowledged) convergence of ideas in the recent regional literature, and it is argued that these ideas are best conceptualised in terms of regional competences. The cluster of high technology firms in the Cambridge region of the UK is briefly considered in order to illustrate the main ideas of the paper.

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TOWARDS A COMPETENCE THEORY OF THE REGION

1. Introduction

Recent years have witnessed a growing number of attempts to re-conceptualise both the region and the firm in economic research. The focus on the region has revolved around various (overlapping) themes. Some contributions have been concerned with identifying the reasons for the economic success of certain regions, for example the districts of NEC Italy, Toyota City, Silicon Valley, Baden Württemberg. Others have responded to the realisation that an increasing amount of international trade and investment flows have actually increased regional specialisation, rather than uniformity. Perhaps the most discussed of all has been the observation that, despite falling transport and communication costs, there has been an increase in the importance of firm clustering, especially in high technology, information-intensive sectors - sectors which, given the enormous recent developments in information technologies, one might have expected to be the least sensitive to the need for geographical proximity. In attempting to explain these phenomena, a commonly adopted strategy is to focus less upon individual firms and more upon the productive system¹ within which firms operate, with significant attention being paid to the region-specific qualities of the linkages and relations that exist between firms. This strategy has not, however, been a unified or systematic one. One result of this is that there now exists a relative plethora of new terminology including terms such as 'industrial district', 'technological district', 'technology district', 'technological complex', 'innovative milieu', and 'nexus of untraded interdependencies' and it is not clear to what extent these terms, or the literatures generating them, share commonalities at either the substantive or the methodological level.

The literature on the firm has similarly been concerned with linkages and relations: opening up the 'black-box' conception of the firm dominant in mainstream economics and focusing upon the internal

organisational make-up of firms. It is fair to say that this literature on the firm is rather more coherent and less dispersed than that on the region. Certainly, the firm literature exhibits a greater uniformity of terminology and general orientation. This coherence, it has been argued, follows from a shared underlying *competence perspective*, or more specifically, a 'competence theory of the firm' (see especially Foss and Knudsen 1996). The central thesis of the present paper is that there is much value in extending this competence perspective to the analysis of the region. In arguing this, I shall endeavour to clarify what is essential to the competence perspective and show that there are good reasons for extending this perspective beyond the scope of the firm to that of the region; that is, the competence perspective is just as appropriate to analysis of the region. I shall also outline recent points of convergence in the regional literature and indicate that the factors focused upon in these accounts are particularly suitable for conceptualisation in terms of competences.

The rest of this paper is structured as follows. The next section reviews the main ideas of the competence theory of the firm literature, and investigates the reasons for its popularity or 'resonance' within both academic and business communities. I argue that the main benefit of this literature is that it draws attention to a layered or structured notion of causality and identifies capabilities and competences as different types of things to the events and states of affairs that they generate and explain. These ideas are extended to a consideration of regional competences in the context of a growing literature which focuses upon the importance of learning and inter-firm linkages in explaining particular spatial patterns of economic behaviour. A final section provides an illustration of the fruitfulness of a conception of regional competences, focusing upon one particular geographically defined productive system, the cluster of high technology firms in the Cambridge region of the UK.

2. The Competence Perspective

Although terms such as competence (Burgelman & Rosenbloom 1989; Prahalad & Hamel 1990) and capabilities (Teece, Pisano & Shuen 1992; Grant 1991) are not always used in precisely the same way, a significant number of recent contributions have focused upon (core) competences, capacities or capabilities of firms which share sufficient 'family resemblances' and key ideas to be regarded as indicative of a distinct, and currently very influential, approach to the study of firm behaviour. Indeed several volumes now exist which are given over, more or less completely, to the task of clarifying the history of, and connections between, such terms as competences and capabilities and to drawing out implications for current research, e.g. (Hamel & Heene 1994; Montgomery 1996; Foss & Knudsen 1996). The most recent of these volumes even begins with the contention that "the competence perspective is - in its various guises - the dominant perspective on firms and firm behaviour today" (Foss 1996, p. 1). In order to distinguish the main features and advantages of this general *perspective*, a contrast can usefully be drawn with two other research approaches/traditions. In particular, the competence perspective can be contrasted with contractual theories of the firm and with the portfolio-based management strategy literature.

Contractarian perspectives emanate from the work of Coase (1937) and include such contributions as Williamson (1975; 1985) and Alchian and Demsetz (1972). These accounts focus upon the cost of making and monitoring transactions, and the reduction of these costs by the organisational hierarchies that constitute the firm. Exchange is primary and the main concerns are problems of forming and maintaining (monitoring/policing) contracts between input owners. In contrast, competence theories focus more upon production, viewing the firm as a 'repository of productive knowledge' (Foss 1996) rather than as a 'nexus of contracts'. Hodgson pursues these differences, emphasising the methodological weaknesses of contractarian approaches. In particular, contractarian approaches are

criticised for their neglect not only of production but of dynamic features of firm behaviour more generally, and also for the treatment of individual agents as atomistic and as given. On the one hand this view of agents deflects attention from the importance of non-contractual relations, such as trust, loyalty, co-operation, etc., and from the ability of individuals to learn and develop. On the other hand, contractarian approaches, as typified by Williamson and Coase, are preoccupied with comparative statics. In fact advocates of the contractarian approach often state explicitly that their approach is unsuitable for the more dynamic processes central to innovation and technical change (Williamson 1985, pp. 143-4). For competence theories, in contrast, learning is centre stage, as are the relationships (of trust, etc.) which surround and facilitate different types of learning and the dynamic processes of change which follow. Although contractarian approaches are often portrayed as attempts to open the 'black box' of mainstream conceptions of the firm, in relation to competence theories at least, such attempts do not go very far, either substantively or methodologically. In short, the competence perspective is much more concerned with a realistic conception of what a firm is and does.

The portfolio approach has emerged from the management strategy literature and is concerned with the particular risks involved in managing some portfolio of businesses. Strategic decision making is related to the allocation of capital across business units, with success depending ultimately upon the market position occupied by a corporation. The competence perspective is instead concerned with the abilities of business units to do certain things, to learn, produce, occupy certain market positions, etc. At the heart of the contrast, although rarely explicitly drawn out, is the idea of a 'deeper' level of analysis. Specifically, the portfolio approach concentrates on the surface phenomena of everyday experience such as turnover, profits, products, etc., while the competence approach is concerned with factors which lie below the surface but condition these everyday phenomena. The following example is illustrative. Rumelt (1994), in

attempting to explain the 'resonance' amongst corporate managers and academics created by Prahalad and Hamel's 1990 article on core-competences, cites the following features of Prahalad and Hamel's account as central:

1. *Corporate span.* Core competences span businesses and products within a corporation. Put differently, powerful core competences support several products or businesses.
2. *Temporal dominance.* Products are but the momentary expression of a corporation's core competences. Competences are more stable and evolve more slowly than do products.
3. *Learning by doing.* Competences are gained and enhanced by work. Prahalad and Hamel (1990, p. 82) say that 'core competences are the collective learning in the organisation, especially how to co-ordinate diverse production skills and integrate multiple streams of technologies... Core competence does not diminish with use...competences are enhanced as they are applied and shared'
4. *Competitive locus.* Product-market competition is merely the superficial expression of a deeper competition over competences. Hamel (1991, p. 83) says 'conceiving of the firms as a portfolio of core competences and disciplines suggests that inter-firm competition, as opposed to inter-product competition, is essentially concerned with the acquisition of skills'. (Rumelt 1994, p. xvi)

Each point contains the idea that competences exist at some 'deeper' level giving rise to and explaining the basic phenomena of portfolio accounts, such as products, market positions, and especially, sustained competitive advantages or disadvantages. The more superficial focus of the portfolio approach ("attention was focused on products, profits were measured and tracked with precision" (Rumelt

1994, p. xviii)), is replaced in the competence perspective by a concern with phenomena which underlie and govern. Although other accounts do not use the same terminology, (core vs non-core, etc.), a pervasive feature of all of these accounts is an acceptance of, and focus upon, the *structured nature of the explananda of firm performance*.

Contrasting the competence approach to the portfolio and (in particular) to the contractarian approaches highlights the concern in the former with the internal workings of the firm. Highlighting such concerns as the main distinguishing feature of the competence perspective raises the issue of the relation of the competence perspective to another collection of contributions that has traditionally been associated with the concern to illuminate the internal workings of the firm, that is the resource-based tradition. The resource-based view emanates from the work of both management strategists, such as Andrews (1980) and Chandler (1962) as well as economists such as Penrose (1959) and Wernerfelt (1984). Similarities between the two traditions are regularly drawn out, and the resource-based contributions are even presented as precursor of the competence perspective (Montgomery 1996). However, various accounts have been criticised for not being aware of important differences - these criticisms usually involving the idea that the basic categories of competences and resources have not been sufficiently distinguished. For example, various criticisms of the classic Prahalad and Hamel 1990 contribution take the form that the notion of competence itself is left unacceptably vague because of a failure to distinguish competences and resources (see Eriksen and Mikkelsen, 1996). Prahalad and Hamel's definition of core competences are the "collective learning in the organisation, especially how to co-ordinate diverse production skills and integrate multiple streams of technologies" (Prahalad & Hamel 1990, p. 82). Both Eriksen and Mikkelsen and Stalk, Evans and Schulman (1992, p. 170) point out that Prahalad and Hamel's examples focus upon "pools of functionally specific skills" and make no significant

distinction between pools of skills that can be drawn upon by the firm and what the firm actually is, its competences.² However, and this is the main point of referring to these issues here, even in accounts that attempt to distinguish resources and competences explicitly (Dierickx & Cool 1989; Teece, Pisano & Shuen 1990), there is significant ambiguity. The primary distinction made is that whereas resources are both tangible (physical capital) and intangible (human capital), competences are always intangible. But this distinction still does not help, since the focus of attention (for the critics noted above) is the failure to distinguish intangible resources from intangible competences.³ In some of the more sophisticated accounts the idea of a competence is linked to that of emergent properties (e.g., see Foss & Eriksen 1996). But the notion of emergence employed is left undeveloped. Specifically, there is little explicit consideration of how the idea of emergent properties relates to other ideas such as the 'deep' character of competences or even of the conception of social system (in this case the firm) which these properties constitute. However, it is possible (and necessary given the concerns of this paper) to reconstruct a more precise account of the nature of competences, especially in regards to the relevance of a notion of competences to the conceptualisation of social systems other than firms.⁴

2.1. System competences and social interaction

The idea of a competence or capability presupposes a structure of some kind or a structured 'thing'. Cups (have the power to) hold tea, bicycles transport their riders, violins can be used to play music (or table tennis) because of their internal structures. For example, it is the structure of the violin which allows it to vibrate and create sounds in certain ways (or hit ping-pong balls!). Certain events or outcomes are explained in terms of other kinds of things - structures. This insight is underpinned by recent contributions to the philosophy of science and social theory. It is recognised that an essential feature of scientific enquiry is a movement in levels, this movement being

termed, following Peirce (1867) and Hanson (1965) as retrodiction. In the context of specifically social enquiry, there has been much attention given to the nature of social structures and, especially, their qualities as underlying and generative of outcomes and states of affairs. More specifically, social structure is understood to consist in rules, relations and positions. Taking these in turn, (social) rules are conceptualised as something other than the patterned behaviour they govern. The motorist who does not stop at a red light does not lead us to doubt our understanding of the rule 'when at traffic lights stop if the light is red'. Neither does it force us to consider such a rule as an 'average' or 'normal' description of what people do, even though most people may indeed stop at red lights. The rule is not, and cannot be evaluated as, a prediction of actual behaviour, it is something different in kind. Secondly, whilst there is general agreement that the social world is highly rule governed, the existence of social relations is more often contested. However, once it is accepted that different rules, rights obligations, etc., are not equally applicable to all, it is difficult to avoid some notion of relations and positions. The sorts of activities allowed or constrained for a foreman are different to those of a manager or employee. Each have different responsibilities and rights in virtue of the position they occupy. The activities constrained or enabled tend to be oriented towards some other group, thus indicating a causal role for certain forms of relationship. Of particular importance are internal relations, where two objects are what they are by virtue of the relationship in which they stand to each other. For example with a wife and husband, landlord and tenant, it is not possible to have one without the other. For each couple the relation defines what each is and does. Thus the basic building blocks of society are positions which depend upon, or are constituted by, social rules, rights and obligations defined in relation to other positions which are also occupied and open to change by individuals.

On this conception, social systems (firms, trade unions, national and regional economies etc.) can be understood as an "ensemble of

networked, internally related positions with their associated rules and practices” (Lawson 1997, p. 165). This conception, amongst other things, avoids the frequently noted problem of conceptualising such systems as either some simple aggregation of individuals or individuals ‘writ large’. Of particular significance, in this context, is the advantage that the elements of structure (rules, relations and positions) are elaborated in such a way as to avoid their collapse into the actions, practices, etc., that they explain. The distinction between events and underlying mechanisms is maintained, with competences being located at the latter level. Retroducing the capabilities of material ‘things’ like pieces of copper is essentially the same as retroducing the capabilities of firms, regions or nations. For example, the structure of copper (identified as an element of the deep) can explain various (events) activities of electrical appliances. In a similar way, the ability of firms to learn, produce or distribute (deep) can be used to explain (events such as) the existence of particular products, the occupancy of particular market positions, levels of unemployment, etc. In short, social systems such as firms, regions and economies have competences and capabilities because of the manner in which they are structured.

Two distinct paradigms for ‘the structured’ are often distinguished, the first relating to the powers of a thing or particular kind, the second relating to co-determining relations, relations between elements of a system (Bhaskar 1986, pp. 131-132). However, such a distinction seems inappropriate in this context.⁵ It is better, I suggest, to think of both simply as particular structures (within structures) and focus upon their different modes of existence - that is, the ways in which different structures are reproduced or transformed. The different structures which account for the capabilities of humans, cups or trade unions may be reproduced at the biological, physical or societal level, and accordingly need to be studied in different ways. Systems (such as trade unions, firms or regions) have capabilities in the same way (and to the extent) that the relations between the elements are indeed really existing things. The distinguishing feature

of social systems is that they only exist in virtue of the activities they govern or facilitate. It is in this sense that competences can be understood as the *emergent* properties of social activity.⁶ On this account, firms and regions consist of capabilities which are the emergent properties of social activity, and both take the form of structures within structures (rather than structured things). Various implications follow from this conception of system competences. First, at this level of analysis at least, it is not clear that there is a meaningful distinction to be made between resources and competences, once a clear distinction between a 'thing' (which can draw upon external resources and be constituted by competences) and a 'system' becomes less clear. Secondly, distinguishing between such systems as firms and regions must involve investigation of the manner in which the relevant social interaction (from which their competences emerge) are reproduced or transformed. For example, firm competences will typically derive from interaction which is reproduced under legal/contractual conditions which is likely to be irrelevant to the constitution of the region. Thirdly, and most importantly, it appears that the more that attempts are made to clarify exactly what is meant by the term competence, the more relevant the resulting conception appears to be to the region. In other words, although firms and regions are not the same things, both are ensembles of competences which emerge from social interaction and so there appears to be no reason at all why the competence perspective should not be as equally relevant to the study of the region as to the study of the firm.

3. Regional Competences

I suggested above that the fruitfulness of a conception of regional competences can be argued for not only by demonstrating the appropriateness of the competence perspective outside the confines of a theory of the firm, but also by indicating that recent shifts in focus in a variety of accounts concentrating upon the region (or, more correctly, a regionally defined productive system) are

(independently) converging upon factors which can themselves be usefully conceived of as regional competences. To pursue this latter point, a brief reference needs to be made to these recent developments and in particular to the factors upon which these strands of thought are converging.

The first of these strands can be termed the Californian school of economic geography (e.g. Scott 1986; Scott & Storper 1987). The main shift in emphasis identifiable within these accounts is from a focus upon *traded* to *untraded* interdependencies. In the early contributions of this school, regional business clustering is theorised in terms of the relationship between the division of labour, transactions costs and agglomeration. The (vertical) disintegration of production leads to increased transactions costs which leads to agglomeration as agents attempt to reduce extra transactions costs arising from geographical distance. However, the focus in these early contributions is predominately on 'traded' relations, typically conceptualised as input-output relations. More recently, Storper, drawing upon ideas from the technological trajectories literature (see Dosi 1987; Dosi & Orsenigo 1985; Arthur 1989) and the technological learning literature (Lundvall 1992), has argued that it is *untraded* interdependencies that explain the observed spatial patterns and that these "cannot be easily accommodated within transactions-cost based theories" (Storper 1995, p. 207). These untraded interdependencies can not be captured by reference to input-output transactions or contract exchanges, but involve: technological spillovers; conventions, rules and languages for developing, communicating and interpreting knowledge, etc. A central point is that these untraded interdependencies give rise to or generate observed input output relations but are more enduring. Storper explicitly makes the argument that Silicon Valley shows no sign of weakening as an agglomeration because "geographically-constrained untraded interdependencies outlive geographically constrained input output linkages" (Storper 1995, p. 209).

A similar shift in focus can be discerned in the literature on industrial districts inspired by the work of Marshall. In this literature, a firm's survival is taken to depend upon increased differentiation and more complex or sophisticated co-ordination (see You and Wilkinson 1994, p. 261). Two elements can be discerned in this move to increased interdependence which have clearly been brought out in the literature influenced by Marshall, especially that concerned with the industrial districts of north east and central Italy. There is much concentration, in the literature, on transactions between firms in sequential stages in supply chains, frequent sharing of equipment, the possibility of jointly taking on larger orders, large pools of appropriately skilled labour, etc. Moreover, there is a special emphasis upon the importance of particular forms of co-operation which take place in these districts, e.g. sharing technical information, subcontracting out to other (often less successful) competitors, refraining from wage competition and labour poaching (Brusco & Sabel 1981; Sabel & Zeitlin 1985, pp. 146-149; Lorenz 1992). However, in explaining these linkages or simply in elaborating them in more detail, two different emphases are evident. The first simply relates to the existence of external economies (economies of scale which, although external to a particular firm, are internal to the productive system, e.g. industrial district, as a whole). The second relates to a general climate or 'industrial atmosphere' (see especially (Bellandi 1989; Becattini 1990). In Marshall's work this aspect is most clearly brought out in his famous discussion of special and hereditary skills - where "the mysteries of the trade become no mysteries; but are.... in the air". Here, however the emphasis is upon the network of conventions, rules, common understanding, etc., which make up the cultural, socio-economic 'industrial atmosphere' (Bellandi 1989).

A third example is to be found within the GREMI literature (Aydalot 1986; Aydalot & Keeble 1988; Camagni 1991). In this literature it is the local environment or *milieu* which is seen as the relevant unit of analysis, the focus being especially on the ability of the milieu to

foster or facilitate *innovation*. In particular, the emphasis is upon a complex network of mainly informal social relationships (Camagni 1991). Innovations result from 'collective interactions' linking a system of production to a particular technical culture (Crevoisier & Maillat 1991). In attempting to distinguish the GREMI approach from others which emphasise the role of socio-cultural relationships, Camagni isolates what he terms static and dynamic approaches to the interpretation of economic space (both of which are aspects of the GREMI approach). Amongst the former, Camagni includes both transaction costs and Marshallian external economies approaches. When discussing the 'dynamic' aspects of the GREMI approach, Camagni points to the milieu as, on one hand, facilitating 'collective learning' and, on the other hand, reducing 'dynamic uncertainty'. The term 'collective learning', although not always used consistently within the GREMI literature, may be defined as the creation and further development of a base of common or shared knowledge among the individuals within a productive system. This allows both the co-ordination of action and the resolution of problems (see Lazaric and Lorenz 1997). Essentially, collective learning refers to that learning which is made possible through membership of some particular milieu (set of relationships making up a productive system, see C.Lawson 1997). Shared knowledge results from (and adds to) the establishment of a common language, technical know-how, and organisational conventions. Uncertainty, particularly that faced by small firms, is also understood to be reduced by membership of the milieu. Various forms of uncertainty are considered, for example following from: the complexity of information (requiring a *search* function); the problem of inspecting, *ex-ante*, qualitative features of inputs, equipment etc. (requiring *screening*); the problem of processing available information (*transcoding*); and assessing the outcomes of one's own actions and the actions of others. A distinction is then made between the types of linkages that serve to reduce uncertainty in each case. Collective information gathering and screening takes place through informal interchange of information between firms signalling, for example, various

successful decisions or reputation. Skilled labour mobility within the local labour market, customer-supplier technical and organisational interchange, imitation, application to local needs or general purpose technologies and informal cafeteria effects, enable the transcoding function. A collective process of selecting decision routines results from managerial mobility, imitation, co-operative decision-making through local associations etc. Finally it is argued that an informal process of decision co-ordination is achieved via interpersonal linkages through families, clubs, associations etc., which has the advantage of easier and faster information circulation and similar cultural backgrounds. None of these factors are likely to be captured by any kind of input-output analysis, or study of simple (material) transactions.

To take stock, there are clear common developments in each of these approaches. Given an environment of organisational (vertical) disintegration, the links between smaller units have increasingly become the major focus of attention. However, a concern with such linkages has increasingly been accompanied by a movement in focus away from simple input-output, or more superficial, linkages to a consideration of underlying relations which are somehow more enduring, but less 'concrete' in some sense - factors which are 'in the air' or 'untraded'. Now it is precisely these factors that I am suggesting underlie, or constitute, the region's competences or capabilities.⁷ In particular, I am arguing that our understanding of such factors can benefit from reference to a growing literature on the nature and importance of firm-based competences and capabilities, but they are not simply 'in the air' or 'untraded'. They are real factors which emerge from, but are reproduced through, the interaction of agents where some systems of interaction are better, more competent, at facilitating some kinds of outcomes than are others.

By way of illustration, let me recast Rumelt's four points in terms of regional as well as firm competences:

1. *(Regional/Corporate) Span.* Competences not only span products but firms themselves at any point in time. Competences support not only many products or businesses within a corporation, but also many corporations.
2. *Temporal dominance.* Competences may not only be more stable and evolve more slowly than products, but may be more stable and evolve more slowly than firms themselves. Thus firms, like products, may be only the temporary expression of a region's competences.⁸
3. *Learning by doing.* Competences are not only gained or enhanced by work but by trade and other inter-firm interaction. How such interaction is structured, how diverse skills are integrated with multiple technologies is learned through such interaction. Again, competences are not diminished with use and are enhanced as they are applied and shared.
4. *Competitive locus.* The relative performance of regions as well as the relative performance of firms is merely the superficial expression of a deeper competition over competences.

3.1. An illustration: the Cambridge high technology cluster

In order to illustrate these ideas further it is useful to focus specifically upon one particular region and its competences. The Cambridge region is an obvious choice, the activities of its high technology firms having generated significant interest amongst academics and policy since the 1970s. It has even been claimed that Cambridge is the country's "undisputed centre for R&D" (Shirreff 1991). The region's success, in R&D especially, appears to have been a major spur to all the main political parties in establishing support for 'enterprise development' (Garnsey & Cannon-Brookes 1993). The county recorded the largest volume of high-technology

employment growth of all the UK counties between 1980 and 1990, with a further growth of 4,800 jobs or 17%, between 1991 and 1995 (Keeble 1989; Keeble 1994). By 1996, the county contained over 1000 firms, overwhelmingly small and medium sized firms, in high technology sectors (Cambridge County Council Research Group 1996). However, it is generally accepted that early optimistic forecasts of rapid growth by the Cambridge region's firms, especially as generated by the 1985 Segal, Quince Wicksteed report, *The Cambridge Phenomenon*, have not been realised. Cambridge has failed to produce large multinational firms to rival those of Silicon Valley. Firms tend to remain small. Furthermore, where growth has occurred, this has often been accompanied by firm takeover by an external source. This state of affairs is often attributed to the region's lack of 'real' networks, either between the university and firms spun out from the University or between the region's firms. Certainly the Segal et al report commented on the lack of hard evidence. Saxenian went on to argue that the early comparisons between Cambridge and Silicon Valley were simply misplaced (Saxenian, 1988). Although observers often cite social networks among local entrepreneurs as a sign of the region's growing potential, Saxenian found no evidence of such interaction - "tenants of the Cambridge Science Park complain repeatedly that there is no interaction - social or technical - among firms there" (Saxenian 1988, p. 74).

I would argue, however, that reconciling these apparently contrasting accounts is relatively straightforward once a regional competence view is adopted. To pursue this it is useful to distinguish three main forms of link, the first of these being between local firms and the University.⁹ Apart from providing a highly skilled pool of labour, the University acts as a very important source of ideas and knowledge. Formal knowledge transfer relationships between the University and local firms exist in the form of consultancy, collaborations, etc. A crucial form of transfer, although often neglected, is the significant spin-out activity in the region, where individuals, encouraged by a conducive attitude towards IPR in the University set up their own

firms to realise their ideas, innovations etc., directly in the market. More often this transfer takes informal channels as personal relationships are maintained between people in both the University and firms, encouraged by a particular college system that enables the maintenance of close relationships through the occupancy of college fellowships. Although a significant amount of firm-university relations are concerned with the flow of ideas, there are other benefits. For example, informal personal relationships act to transfer information about prospective employees, equipment can be borrowed or hired, etc. Less tangibly, but of increasing importance, the University's presence helps to create an academic-type culture and atmosphere in terms of the kinds of local amenities offered such as certain types of cinemas, restaurants, etc., as well as the more direct possibilities for interaction. The second type of relation is between the firms themselves. This is clearly crucial given the small firm size, and often the more important links reflect the fact that a considerable number of tasks must be performed externally. However, many more horizontal, research and knowledge transfer-oriented links also exist between firms in the region. This collaboration is encouraged by the small scale niche orientation of many firms, allowing substantial overlap in activities without direct competition. Many firm links also arise because of corporate spin-off activity. One particularly important example of this process is the activity of the region's technical consultancies. At risk of oversimplification, the (core) consultancy part of the firm concentrates upon solving problems for customers. This serves both as a source of revenue in itself and as a way of discovering what general needs exist at some point in time. If in the course of finding a solution the consultancy feels there is the potential to develop ideas into a more generally sellable product, a firm is spun out to develop the product itself. Again, links with the (consultant) parent persist in many forms, such as financial aid, advice (often from members on the board) use of equipment, contacts, etc. as much because of shared language and experiences as technology or economic objectives. Lastly, the third type of link operates through the

functioning of the local labour market. Apart from providing access to a vast range of technical skills, the frequent movement of employees between firms, and from the University to firms has served to facilitate knowledge flows. This has been so not only because employees take a 'once and for all' stock of knowledge with them, but by maintaining (often personal) relationships with personnel in previous firms or the University, an ongoing link is established with 'ready made' history, trust, and mutual understanding.

Taking these factors together, Cambridge, as a region, has a significant capability for taking new ideas to market especially via the process of new start-ups centred around a research-based idea or innovation. Both the organisational structure of the university and local firms act to encourage spin-off activity. The small size of the region's firms means that many employees are very 'close' to management decision making, providing the motivation and know-how for these employees to start up new firms. Extensive networks exist which, although often taken for granted, are drawn upon and facilitate the workings of firms often with few material resources. With these firms the distinction between products and the firms themselves is in practice quite fine. In competence terms, the firm itself is 'thin'.¹⁰ This can easily explain why many firms fail or are taken over by other firms, and why such a dense network of interconnections is generally needed (although not always directly observable). However, this 'failure' of individual firms to develop 'thick competences' does not have to be seen as a 'regional bad' in any sense. Ideas do come to market, employees do gain experience and training, and form all manner of personal relations which facilitate productive activity, new types of firms (and whole sectors) are likely to emerge relatively quickly and easily (e.g. the growth of the telecoms sector in Cambridge). To focus upon the success or failure of particular firms ignores the features of the wider context in which the conditions for significant technology creation and transfer are reproduced. The firm-based competence perspective correctly

identifies factors other than events and states of affairs (products, market positions, etc.) in explaining economic phenomena. The distinction between firms which are 'thin' or 'deep' in terms of competences is clearly relevant to account for the experience of Cambridge firms. But what is missing in the firm-based competence perspective, in this case, is the regional set of competences within which the firms' activities need to be understood.

4. Conclusion

The basic thesis of this paper is that there exist good grounds for suggesting an extension of the competence perspective from the study of firms to the study of social systems more generally, and in particular to the study of geographically defined productive systems. I have argued that much of the popularity or 'resonance' of the competence perspective follows from its focus upon 'deeper' levels of analysis - understood in terms of a layered causality. On this account competences of productive systems can be understood to exist at this 'deeper' level and are best conceived of as emergent properties of social interaction. As such, the idea of competences is as relevant to the region as it is to the firm. Moreover, a competence perspective or competence theory of the region of this sort seems especially suited to accommodating ideas to which important strands of the regional literature are converging. This has the advantage of bringing together work which has until now proceeded in relative isolation and been rather loosely conceptualised as 'in the air' or as 'untraded'. Lastly, firms as structured processes of interaction always exist within other such processes, including geographically defined productive systems. Thus even in circumstances where the focus is explicitly upon the firm, for example where the aim of analysis is the provision of management 'advice', restriction of the competence perspective to the internal capabilities of firms would appear to be not only unnecessary but unhelpful.

Notes

1. The term productive system (Wilkinson 1983) is used in preference to the more widely used production system in order to avoid the bias towards input-output linkages implicit in the latter.
2. Eriksen and Mikkelsen take these arguments further and argue that a failure to distinguish resources and competences not only leads to vagueness but an inability to understand “processes of competence development and relationships between competences and sustained competitive advantage” (Eriksen & Mikkelsen 1996).
3. What appears to lie at the heart of these ambiguities is a notion of resource as somehow ‘external’ and ‘drawn upon’ which can then be distinguished from a competence which is ‘internal’ and constitutive’. Such a hard distinction, however, only really makes sense where there is some ‘thing’ such as (and perhaps only in the case of) a human being that is clearly distinguishable from external resources that can be drawn upon. But this is plainly not the case here, where the main focus is upon systems of competences.
4. In so doing, I am drawing here upon existing accounts in social theory which have been exclusively concerned with the nature of social being or ontology (especially Giddens 1984; Bhaskar 1989; T.Lawson 1997). Only a brief reference to these accounts can be made here, but see especially T.Lawson (1997) for a detailed account of the implications of adopting such an account for the undertaking of actual research, and Bhaskar (1989) and C.Lawson (1994) for an account of the transformational model of social activity, in which a (complementary) account is given that focuses upon the

emergence of coherent social forms through time, rather than, as here, through space.

5. Indeed, the slippage from the latter to the former paradigm appears to underlie the rather unconvincing attempts to distinguish resources from competences noted above.
6. Some level of organisation can be said to be emergent if there is a sense in which it has arisen out of some lower level but is not reducible to it or predictable from it. Two features of this conception need to be emphasised, that the higher level is not independent of the lower level out of which it has arisen, and indeed is conditioned and 'rooted in' this lower level, and that the highest level cannot be predicted from the lower if it really is emergent in any real sense. Neglect of the former leads to an omission of the human-dependent nature of social structures, neglect of the latter leads to no real notion of social structure at all (as witnessed by even the more sophisticated methodological individualist accounts).
7. I am not however suggesting that existing terminology adequately captures the idea of competence. For example the distinction between traded and untraded does not correspond directly to the distinction between (deep) competence and (surface) event. I am arguing that the sort of factor Storper is concerned with is *better* (more adequately) conceptualised as a regional competence.
8. This is not to encourage a view of firms as simply events. It is likely that some regionally-defined productive system may only be the temporary manifestation of firm competences also (e.g. where multinationals move into an region for a short time to exploit natural resources, cheap labour, etc.). Both firms and regions consist of bundles of competences - which set are more

enduring, explanatorily dominant etc. is an open question (see also footnote 9).

9. This discussion draws upon the findings in Lawson, et al. 1997.
10. Conceptualising such firms as 'thin' in competence terms should not encourage the idea that firms can be conceptualised in the same way as products. Any firm, however small or specialised, is, of course, always capable of producing far more than it does. The point here is to draw attention to a situation where the regional competences are more deeply embedded, more enduring and capable of providing a wider range of actualities than the competences of particular firms, thus providing an example of a situation in which regional competences are explanatorily more important.

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