Deconstructing Clusters: Chaotic Concept or Policy Panacea?

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Abstract

Over the past decade, there has been growing interest in local industrial agglomeration and specialisation, not only by economic geographers but also by economists and by policy-makers. Of the many ideas and concepts to have emerged from this new-found focus, Michael Porter's work on 'clusters' has proved by far the most influential. His 'cluster theory' has become the standard concept in the field, and policy-makers the world over have seized upon Porter's cluster model as a tool for promoting national, regional and local competitiveness, innovation and growth. But the mere popularity of a construct is by no means a guarantee of its profundity. Seductive though the cluster concept is, there is much about it that is problematic, and the rush to employ 'cluster ideas' has run ahead of many fundamental conceptual, theoretical and empirical questions. Our aim is to deconstruct the cluster concept in order to reveal and highlight these issues. Our concerns relate to the definition of the cluster concept, its theorisation, its empirics, the claims made for its benefits and advantages, and its use in policy-making. Whilst we do not wish to debunk the cluster idea outright, we do argue for a much more cautious and circumspect use of the notion, especially within a policy context: the cluster concept should carry a public policy health warning.

Key words: Business location Clusters Porter Chaotic concept Cluster empirics Cluster theory Cluster Policy The cluster 'brand'

> "When *I* use a word", Humpty Dumpty said in a rather scornful tone, "it means just what I choose it to mean - neither more nor less" (Lewis Carroll, *Through the Looking Glass*, 1872).

> "For an idea ever to be fashionable is ominous, since it must afterwards be always old-fashioned" (George Santayana, *Winds of Doctrine*, 1913).

1. Introduction: Clusters and the Reassertion of Location

In recent years there has been a growing interest in the role of location in the global economy. Some have argued that globalisation – especially the creation of borderless markets, the hypermobility of finance, the rise of transnational firms, and the transition to an information economy – signals the 'end of geography' (O'Brien, 1992), the 'death of distance' (Cairncross, 1997), and the 'delocalisation' of economic and social relationships (Gray, 1998). The central claim is that globalisation is rendering the significance of location for economic activity increasingly irrelevant. Others, however, espouse the opposite view, that, to the contrary, globalisation is actually increasing rather than reducing the importance of location, that it is promoting greater regional economic distinctiveness, and that regional economies rather than national economies are now the salient foci of wealth creation and world trade (Ohmae, 1995; Coyle, 1997, 2001; Krugman, 1997; Porter, 1998; Scott, 1998, 2001; Fujita, Krugman and Venables, 2000). Thus, as the business economist Michael Porter (1998a, p.5) puts it:

> In a global economy – which boasts rapid transportation, high speed communications and accessible markets – one would expect location to diminish in importance. But the opposite is true. The enduring competitive advantages in a global economy are often heavily localised, arising from concentrations of highly specialised skills and knowledge, institutions, rivalry, related businesses, and sophisticated customers (Porter, 1998, p.90).

At the same time, it is alleged, increasing global economic integration itself leads to heightened regional and local specialisation, as falling

transport costs and trade barriers allow firms to agglomerate with other similar firms in order to benefit from local external economies of scale (Krugman, 1991, Fujita, Krugman, Venables, 2000). Agglomeration may allow firms to benefit from various forms of market and nonmarket spillovers which in their turn are thought to raise local endogenous innovation and productivity growth (see Martin and Sunley, 1998). For these and other related reasons, it has become fashionable within certain academic and policy circles to talk of the 're-emergence of regional economies' (Sabel, 1994), the 'localization of the world economy' (Krugman, 1997) and the rise of a 'global mosaic of regional economies' (Scott, 1998).

One of the most influential – indeed, *the* most influential - exponent of this emphasis on economic localisation is Michael Porter, whose notion of *industrial or business clusters* has rapidly become the standard concept in the field. Moreover, Porter has not only promoted the idea of 'clusters' as an analytical concept, but also as a key policy tool. Policy-makers all over the globe, from the OECD and the World Bank, to national governments (such as the UK, France, Germany, the Netherlands, Portugal, and New Zealand), to regional development agencies (such as the new Regional Development Agencies in the UK), to local and city governments (including various US states), have become eager to promote local business clusters. Nor has this policy interest been confined to the advanced economies: cluster policies are also being adopted enthusiastically in an expanding array of developing countries (see Doeringer and Terka, 1996; World Bank, 2000). As the celebrated architect and promoter of the idea, Porter himself has been consulted by policy makers the world over to help them identify their nation's or region's key business clusters or to receive his advice on how to promote them. Clusters, it seems, have become a world-wide fad, a sort of academic and policy fashion item.

The more so because the concept has become increasingly associated with the so-called 'knowledge economy', or what some have labelled the

'New Economy'. A key argument here is that the processes driving the new 'knowledge-based economy' - technological know-how, innovation and information creation - appear to be most favourable precisely when such development is localised. Norton (2000), for example, argues that the global leadership of the US in the New Economy derives precisely from the growth there of a number of large, dynamic clusters of (venture capital backed) innovative entrepreneurialism. In the US, Porter is himself leading a major policy-driven research programme to "develop a definitive framework to evaluate cluster development and innovative performance at the regional level" in order to identify the 'best practices' that can then be used "to foster clusters of innovation in regions across the country" (Porter and Ackerman, 2001; Porter and van Opstal, 2001). Likewise, the OECD (1999, 2001) sees innovative clusters as the drivers of national economic growth, and as a key policy tool for boosting national competitiveness.

But the mere popularity of a construct is by no means a guarantee of its profundity. Our argument here is that, seductive though the concept is, there is much about it that is problematic, and that the rush to employ 'cluster ideas' has run ahead of many fundamental conceptual, theoretical and empirical questions (Held, 1996; Steiner, 1998). The aim is to deconstruct the cluster concept in order to reveal and point up these issues. Our concerns relate to the definition of the cluster concept, its theorisation, its empirics, the claims made for its benefits and advantages, and its use in policy-making. Whilst we do not wish to debunk the cluster idea outright, we do argue for a much more cautious and circumspect use of the notion, especially within a policy context. We begin by asking why it is that 'clusters' have gate-crashed the economic policy arena when the work of economic geographers on industrial localization, spatial agglomeration of economic activity and the growing salience of regions in the global economy, has been all but ignored.

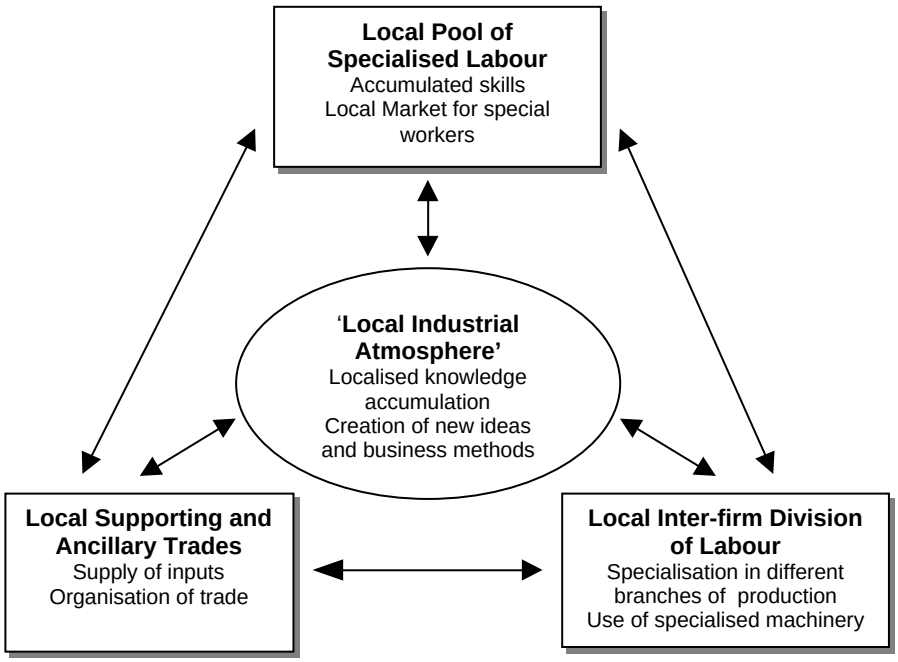
2. Why 'Clusters'?

As Porter admits, the idea of specialised industrial localisation is hardly new. As is well-known, Alfred Marshall, writing at the end of the nineteenth century, included a chapter in his *Principles of Economics* (1890) on 'the concentration of specialised industries in particular localities'. His characterisation of these local concentrations of specialised activity was cast in terms of a simple triad of external economies: the ready availability of skilled labour, the growth of supporting and ancillary trades, and the specialisation of different firms in different stages and branches of production (see Figure 1). Marshall argued that once the process of local specialised industrial concentration had got under way, it becomes cumulative and socialised in the locality: "The mysteries of the trade become no mysteries; but are as it were in the air" (Marshall, 1890, p. 271). Marshall saw these localised concentrations of economic specialisation – or 'industrial districts' as he termed them – as an integral feature of industrial organisation. However, he had little to say about how the process of industrial localisation actually starts, why it starts in certain places and not others, or exactly what was meant by 'local'. Further, his interpretation of the formation and evolution of industrial districts was coloured by a questionable theory of the general direction of economic growth and development (namely his view that just as organisms evolve towards greater complexity, industries progress towards greater local specialisation and differentiation - see Sunley, 1992).

A century later and Porter's neo-Marshallian cluster concept has burst on the scene. In his comparative work on international competitiveness, Porter (1990) argued that a nation's leading export firms are not isolated success stories but belong to successful groups of rivals within related industries. He termed these groups 'clusters', sets of industries related by horizontal and vertical links of various kinds (including, but not confined to, input-output trading linkages). Indeed, according to Porter, the significance of these industrial clusters resides in

Figure 1

Marshall's Triad of External Economies of Industrial Localisation (Based on Marshall, 1890, Book Four, Ch. X)

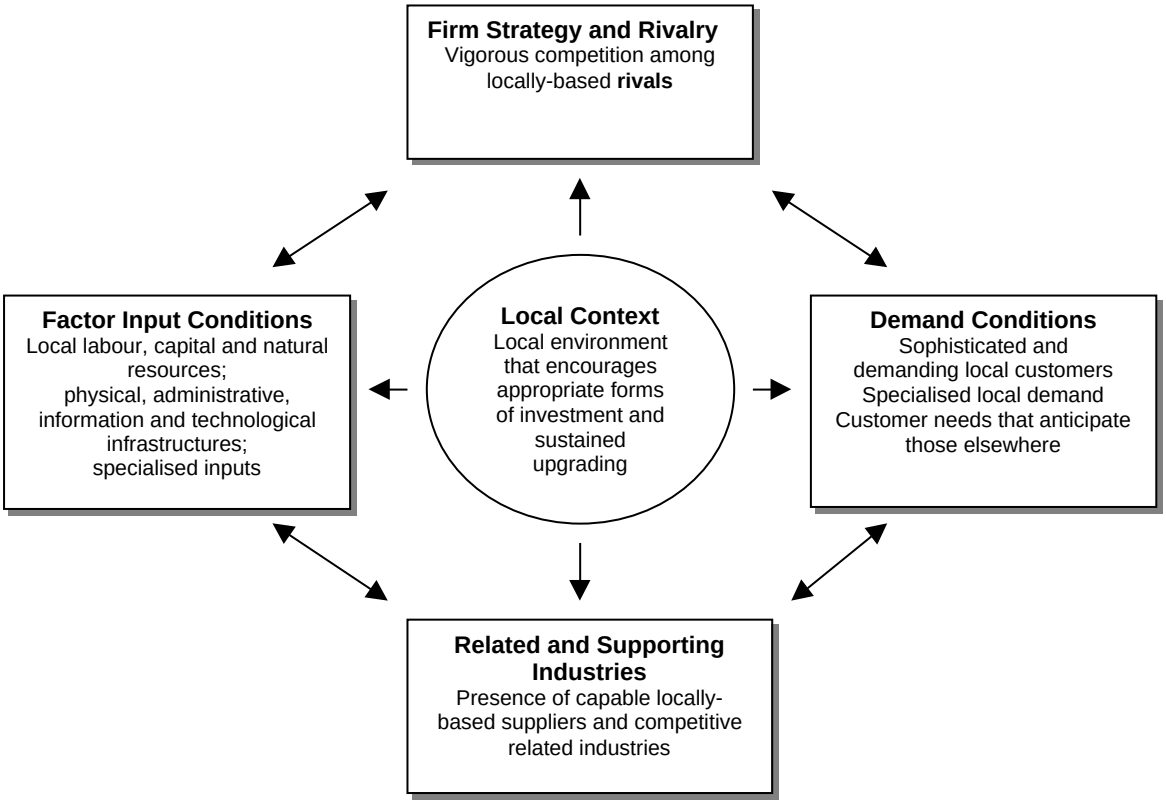


the interactions between four sets of factors that constitute a 'competitive diamond': firm strategy, structure and rivalry; factor input conditions; demand conditions; and related and supporting industries. The more developed and intense the interactions between these four sets of factors, the greater will be the productivity of the firms concerned.

Porter then argued, and this has since become his key theme, that the intensity of interaction within the 'competitive diamond' is enhanced if the firms in the cluster are also 'geographically localised'. According to Porter, the geographic concentration of firms in the same industry is "strikingly common around the world" (1990, p. 120). More specifically, he suggests that a nation's most globally competitive industries are also likely to be 'geographically clustered' within that nation. Hence, what originally started out as a way of decomposing a national economy, the cluster as a group of interlinked industries and associated activities, has become a spatial metaphor, the cluster as a *geographically localised* grouping

Figure 2

Porter's Competitive Diamond of Local Industrial Clustering (Based on Porter, 1998, Ch 10).



of interlinked businesses. The competitive diamond is the driving force making for cluster development, and simultaneously the cluster is the spatial manifestation of the competitive diamond (Figure 2). The systemic nature of the diamond produces local concentration of the leading rival firms, which in its turn magnifies and intensifies the interactions between the factors. Hence, according to Porter (1990, p. 157), "The process of clustering, and the intense interchange among industries in the cluster, also works best *where the industries involved are geographically concentrated*"(emphasis added). There is then a close affinity between Porter's schematic 'competitive diamond' of local business clustering and Marshall's 'triad' of external economies of industrial localisation.

But Porter's cluster notion is not the only rediscovery and reinvention of Marshall's ideas to have taken place in recent years. For the past two decades or more, economic geographers have devoted considerable effort to studying local industrial specialisation, spatial economic agglomeration and regional development, and to identifying the economic, social and institutional processes involved. They too have invented a whole series of neologisms to capture and represent the spatial form and nature of local business concentrations, including: 'industrial districts', 'new industrial spaces', 'territorial production complexes', 'neo-Marshallian nodes', 'regional innovation milieux', 'network regions', and 'learning regions' (see for example, Scott, 1988; 1998; Amin and Thrift, 1992; Harrison, 1992; Harrison, Kelly and Grant, 1996; Markusen, 1998; Asheim, 2000). Not only is this corpus of work by economic geographers largely ignored by Porter (and by other economists who have recently discovered geography, such as Paul Krugman), in total contrast to his cluster concept their ideas have singularly failed to have any impact on policy-makers. Why then has his work proved so fashionable and influential while that of economic geographers has not? Why have some economic geographers themselves started to use cluster terminology in preference to their own (for example, Pinch and Henry, 1999; May et al, 2001; Scott, 2001; Keeble and Wilkinson, 2000; Keeble and Nachum, 2002)?

One possible reason is that, from the beginning, Porter has rooted and promoted his cluster concept within an overarching focus on the determinants of 'competitiveness' (of firms, industries, nations, and now locations). This resonates closely with what has become a major issue in economics and a key objective amongst policy-makers: namely, the importance of competitiveness for succeeding in today's global economy. Porter's avowed aim is to inform companies, cities, regions and nations how to compete on the world stage, and the undoubted lure of his cluster concept is that it sits well with the current preoccupation with micro-economic supply-side intervention, and especially with the policy imperatives of raising productivity and innovation (Porter, 1996; 1998b,c;

2000a, b, c). As an alleged key determinant of competitiveness, Porter's clusters have inevitably attracted considerable interest, particularly given the emphasis he is currently assigning to geographical industrial clusters in promoting the competitive advantage of the US economy (Porter and Opstal, 2001). Economic geographers' work on industrial localisation and regional agglomeration, on the other hand, has tended to be more diffuse in its aims, and much less concerned with core issues such as the performance, productivity and competitiveness of firms.

A second, and related, reason could be the way in which Porter has conveyed his ideas on clusters. His discussion is framed in terms of the economics of 'business strategy' (a long-standing core theme in his work on competition), and not in terms of the sorts of more general theoretical debates and concepts - such as 'post-Fordism', 'flexible specialisation', 'modes of regulation', and so on - found in economic geography. The latter do not chime easily with, or translate readily into, practical business and policy strategy. In contrast, Porter's explicit goal "is to develop both rigorous and useful frameworks for understanding competition that effectively bridge the gap between theory and practice" (1998a, p.2). Cluster theory, he argues, is "not only a tool for managers, but also a microeconomic – based approach to economic development for governments that is closely tied to actual competition" (op cit, p. 7). At the same time, in line with this goal, his easy 'business- and policy-friendly' writing style, at once both accessible and common-sense, is undeniably seductive, and is quite different from the more 'academic' discursive approach that characterises much economic geography writing in this field. At the same time, there can be little doubt that the popularity of Porter's cluster concept, compared to economic geographers' work on similar notions, derives in large part from his celebrated international standing as a leading writer on business strategy. This reputation, combined with his self-confident, authoritative and proselytising style, lends his cluster concept an apparent authenticity and legitimacy that policy-makers have found difficult to resist. In contrast, economic

geographers have had much less influence on business policy: indeed the shaping of public policy has, unfortunately, taken something of a back seat in the discipline's research agenda (Markusen, 1998; Martin, 2001; Glasmeier, 2000).

But a third, and equally important reason for its rapturous reception is the very nature of the 'cluster concept' itself. Porter's cluster metaphor is highly generic in character, being deliberately vague and sufficiently indeterminate as to admit a very wide spectrum of industrial groupings and specialisations (from footwear clusters to wine clusters to biotechnology clusters), demand-supply linkages, factor conditions, institutional set-ups, and so on, while at the same time claiming to be based on what are argued to be fundamental processes of business strategy, industrial organisation and economic interaction. Rather than being a model or theory to be rigorously *tested and evaluated*, the cluster idea has instead become accepted largely on faith as a valid and meaningful 'way of thinking' about the national economy, as a *template or procedure* with which to decompose the economy into distinct industrial-geographic groupings for the purposes of understanding and promoting competitiveness and innovation. The very definitional incompleteness of the cluster concept has been an important reason for its popularity (Perry, 1999). In the words of one analyst, clusters have "the discreet charm of obscure objects of desire" *(*Steiner, 1998, p. 1). However, although the definitional and conceptual elasticity of the cluster concept can be seen as a positive strength, in that it permits a wide range of cases and interpretations to be included, we consider it to be problematic. The concept has acquired such a variety of uses, connotations and meanings that it has, in many respects, become a 'chaotic concept', in the sense of conflating and equating quite different types, processes and spatial scales of economic localisation under a single, all-embracing universalistic notion.

3. A Chaotic Concept?

The multidimensionality and vague character of the concept pose problems of theoretical and empirical definition, as well as methodological investigation. Not only are clusters vague in geographical scale and internal economic dynamics, so that they are hard to identify with precision, different analysts use the idea in different ways to suit their own purposes (see, for example, the multiplicity of interpretations used in the *World Congress on Local Clusters*, DATAR-OECD, 2001). There are several main axes of confusion.

A major source of ambiguity is that of definition. The dramatist Alan Bennett tells the story of how his aged mother once looked at sheep and said "I know what they are, but I don't know what they're called"(Bennett 1994, p. 127). The situation in the cluster literature seems to be the reverse: we know what they're called, but defining precisely what they are is much more difficult. In his own work, Porter has defined clusters as:

> Geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete but also co-operate (Porter, 1998, p. 197).

Thus, there are two core elements in Porter's definition. First, the firms in a cluster must be *linked* in some way. Clusters are constituted by interconnected companies and associated institutions linked by commonalities and complementarities. The links are both vertical (buying and selling chains), and horizontal (complementary products and services, the use of similar specialised inputs, technologies or institutions, and other linkages). Moreover, most of these linkages, he argues, involve social relationships or networks that produce benefits for the firms involved. Hence,

> A cluster is a form of network that occurs within a geographic location, in which the proximity of firms and institutions ensures certain forms of commonality and increases the frequency and impact of interactions (1998a, p.226).

The second fundamental characteristic, therefore, is that clusters are *geographically proximate* groups of interlinked companies. Co-location encourages the formation of, and enhances the value-creating benefits arising from, networks of interaction between firms.

The obvious problem raised by these cluster definitions is the lack of clear boundaries, both industrial and geographical. At what level of industrial aggregation should a cluster be defined, and what range of related or associated industries and activities should be included? How strong do the linkages between firms have to be? How economically specialised does a local concentration of firms have to be to constitute a cluster? There is no explicit reference in Porter's definitions that clusters are economically specialised entities in the Marshallian sense, yet all of his examples are, often very narrowly so. In addition, at what spatial scale, and over what geographical range, do clustering processes (inter-firm linkages, knowledge spillovers, rivalry, business and social networks, and so on) operate? What spatial density of such firms and their interactions defines a cluster? The difficulty is not just that the boundaries of clusters, as Porter admits, are 'continuously evolving', as new firms and industries emerge and established ones shrink or decline. More fundamentally, the definition itself seems intentionally opaque and fuzzy.

Cluster boundaries, according to Porter (1998, p.204), "rarely conform to standard industrial classification systems, which fail to capture many important actors in competition as well as linkages across industries …. Because parts of a cluster often fall within different traditional industrial or service categories, significant clusters may be obscured or even go unrecognised". He refers to the 400-firm medical devices cluster in Massachusetts, which he says has long remained all but invisible, buried within larger and overlapping standard industry categories. In part then, defining the boundaries of clusters appears to be about deriving a detailed classification of economic activity that more accurately reflects the range of specialised economic activity. But then a cluster is also about linkages within and between such specialised activities, about tracing the

supply chains supporting what is seen as the 'core' activity of the cluster. So as Porter admits,

> Drawing cluster boundaries is often a matter of degree, and *involves a creative process* informed by understanding the most important linkages and complementarities across industries and institutions to competition (1998a, p. 202; emphasis added).

He suggests that "the strength of 'spillovers', and their importance to productivity and innovation determine the ultimate boundaries"; that "cluster boundaries should encompass all firms, industries and institutions with strong linkages", whereas "those with weak and non-existent linkages can safely be left out" (1998a, p.202). Exactly how the 'strength' of different sorts of linkages and spillovers should be measured, and where the cut off between 'strong' and 'weak' ties falls, are, however, issues that are left unspecified. The existence of clusters, appears then, in part at least, to be in the eye of the beholder – or should we say, creator?

And how does the requirement of 'geographical proximity' enter into the equation? Although throughout his work on clusters Porter emphasises the critical role of 'geographical proximity' in the formation, performance and identification of clusters, the term is never defined with any precision. Indeed, it appears to be highly and ridiculously elastic, for he suggests in fact that clusters can be found at almost *any* level of spatial aggregation: "They are present in large and small economies, in rural and urban areas, and at several geographic levels (for example nations, states, metropolitan regions, and cities" (1998, p.204); their geographical scope can even encompass "a network of neighbouring countries" (1998a, p.199). To make matters worse, "the appropriate definition of a cluster can differ in different locations, depending on the segments in which the member companies compete and the strategies they employ" (1998, p. 205). Such geographical licence has given authors unlimited scope in their definition and application of the concept (see Table 1). At one extreme, the term has

Table 1. Clusters: The Confusion of Definitions
(Some Examples Drawn from the Cluster Literature)

Porter (1998, p. 199) "A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities".

Crouch and Farrell, (2001, p. 163) "The more general concept of 'cluster' suggests something looser: a tendency for firms in similar types of business to locate close together, though without having a particularly important presence in an area."

Rosenfeld (1997, p. 4) "A cluster is very simply used to represent concentrations of firms that are able to produce synergy because of their geographical proximity and interdependence, even though their scale of employment may not be pronounced or prominent."

Feser (1998, p. 26) "Economic clusters are not just related and supporting industries and institutions, but rather related and supporting institutions that are more competitive by virtue of their relationships."

Swann and Prevezer (1996, p. 139) "Clusters are here defined as groups of firms within one industry based in one geographical area."

Swann and Prevezer (1998, p. 1) "A cluster means a large group of firms in related industries at a particular location".

Simmie and Sennett (1999a, p. 51) "We define an innovative cluster as a large number of interconnected industrial and / or service companies having a high degree of collaboration, typically through a supply chain, and operating under the same market conditions."

Roelandt and den Hertag (1999, p.9) "Clusters can be characterised as networks of producers of strongly interdependent firms (including specialised suppliers) linked each other in a value-adding production chain."

Van den Berg, Braun and van Winden (2001, p. 187) "The popular term cluster is most closely related to this local or regional dimension of networks … Most definitions share the notion of clusters as localised networks of specialised organisations, whose production processes are closely linked through the exchange of goods, services and / or knowledge."

Enright (1996, p. 191) "A regional cluster is an industrial cluster in which member firms are in close proximity to each other."

been used to refer to national groups of industries and firms that are strongly linked (in terms of traded interdependencies), but dispersed over several different locations, but dispersed over several different locations within a country, with no obvious major geographical concentrations (this was in fact Porter's original use of the 'competitive diamond'). Roelandt and den Hertog (1999, p. 9) introduce a major OECD collection on clusters by defining them in this way, as "networks of production of strongly interdependent firms (including specialised suppliers) linked to each other in a value-adding chain" with no necessary element of spatial localisation. At the other extreme, the term is used to refer to a local grouping of similar firms in related industries within a highly spatially circumscribed area - such as the media cluster in Lower Manhattan, New York (Porter, 1998, p. 205), or the film and media cluster in Soho, London (Nachum and Keeble, 1999). In between, Porter refers to 'regional clusters', such as the California agribusiness cluster, and the Massachusetts medical devices cluster. He lists some 60 of these in the US (Porter, 1998.p.229), although in most cases the clusters are far from being state-wide. Elsewhere, clusters and regions are used interchangeably (Baptista and Swann, 1998; Enright 1996). The confusion is further heightened by other studies which equate clusters and 'cities'. For example Swann (1998, page 63) suggests that "London seems to be an evergreen cluster… that through luck or design happens to have mature industries which attract new industries". Still others suggest, more specifically, that the proximity inherent in a cluster extends up to a 'range of fifty miles' (May et al, 2001), but such demarcations are obviously quite arbitrary.

The problem is that geographical terminology is used in a quite cavalier manner, depending it seems, as Porter himself admits, on what the aim of the exercise is, or the client or policy-maker for whom the analysis is intended. The key weakness is that there is nothing inherent in the concept itself to indicate its spatial range or limits, or whether and in what ways different clustering processes operate at different geographical scales. We are not suggesting that the cluster concept should refer to a

particular pre-specified geographical size or scale; but to use the term to refer to *any* spatial scale is stretching the concept to the limits of credulity, and assumes that 'clustering processes' are scale-independent. If the same externalities and networks that typify clusters do indeed operate at a whole variety of spatial scales, this surely weakens the empirical and analytical significance of the cluster concept.

This lack of geographical precision and consensus is further compounded by the vague typologies of cluster types and evolutionary paths that have been proposed. Porter suggests that clusters "vary in size, breadth, and state of development" (1998a, p. 204). Some clusters consist primarily of small and medium sized firms (he cites the Italian footwear and North Carolina home furniture clusters). Other clusters contain both small and large firms (he gives the German chemical cluster as an example). There are university-centred clusters and clusters with no university connections; clusters of traditional industries and clusters of high-technology industries. There are nascent clusters, new clusters, established clusters and declining clusters. Other authors have sought to construct typologies based on the evolution of clustering processes. Rosenfeld (1997), for example, distinguishes three types. 'Working' or 'overachieving' clusters are 'self-aware' and produce more than the sum of their parts. Latent or 'underachieving' clusters present opportunities that have not yet been fully exploited. 'Potential' clusters have some of the key conditions but lack some inputs and critical mass. This latter type is particularly problematic, since it becomes difficult to exclude almost any firm from a 'potential' cluster, especially when aspirational policy-makers are eager not to be left out of the cluster promotion game. In reality, there are probably very few firms that do not have horizontal or vertical links (co-operative or competitive) of some sort with another loosely-defined geographically proximate firm. Does this mean that virtually every firm could be considered part of a 'potential' cluster? As Jacobs and de Man (1996) complain, typologies that employ categories such as embryonic, latent, and potential come close to incorporating almost all firms in

clusters of one type or another, and as such become virtually meaningless. Equally problematic is the tendency to devise typologies that relate specifically and only to the particular set of clusters being studied, with little or no intention to discern elements or features that might be of wider relevance.

The proliferation of cluster typologies may well be a genuine attempt to recognise the diversity of cluster forms and cluster development. But appeals to such diverse forms, sizes, stages of development, emergence, depth, breadth, level of aggregation and the like, is equally an indication that the cluster concept is something of a chaotic one. Porter sees the Italian industrial districts as one form of cluster just as high-technology areas such as Silicon Valley are another. What he calls clusters, French analysts refer to as 'local production systems' (see DATAR-OECD, 2001). Recently, drawing on a survey of European examples, Crouch et al (2001) see 'empirical clusters' as one of three types of local production system, distinct from industrial districts on the one hand and what they refer to as the 'networked firm' on the other. In contrast, in his discussion of the role of regions in the recent competitive resurgence of the US economy, Best (2001) uses the terms industrial districts and clusters interchangeably. And so the confusion goes on. Classification is of course an important stage of theorising and analysis. But to be meaningful and useful, typologies need to be based on in-depth comparative analyses of cluster profiles and processes (Markusen's (1996) typology of industrial districts provides some pointers in this regard). Despite the vast and still expanding literature on clusters, however, there has been little detailed work of this kind.

4. What Sort of Theory for What Sort of Cluster?

All of which begs the issue of the status of 'cluster theory'. Porter's 'clusters' are *constructs*. They are as much analytical creations as they are naturally occurring phenomena. They have no essential self-defining

boundaries, whether in terms of inter-sectoral, inter-firm linkages, information networks, or geographical reach. The notion is so generic that it used as a sort of cover term to refer to a whole assortment of types and degrees of specialised industrial localisation (for example, see Porter, 2001). Little wonder then, that cluster theory is in a similar state of confusion.

According to Porter:

> A variety of bodies of literature have in some respects recognized and shed light on the phenomenon of clusters, including those on growth poles and backward and forward linkages, agglomeration economies, economic geography, urban and regional economics, national innovation systems, regional science, industrial districts and social networks. … Overall most past theories address aspects of clusters or clusters of a particular type. (1998,p. 207).

While eclecticism can be a virtue under certain circumstances, forging a theoretical synthesis out of this list of perspectives would seem a dubious endeavour. Yet this is what Porter tries to do. He sees his task as "embedding clusters in a broader and dynamic theory of competition that encompasses both cost and differentiation and both static efficiency and continuous improvement and innovation, and that recognises a world of global factor and product markets" (op cit, p.208; see also Porter, 2000). Porter's theory of competition is not simply about cost advantages and factor inputs, but also about 'strategic positioning' by companies, that is choosing activities that are different from and superior to those of rivals. The importance of clusters, Porter argues, is that by providing a favourable local environment of competing firms, specialised inputs, and supporting institutions, they foster the inter-firm rivalry and knowledge spillovers that promote a dynamic process of strategic positioning and 'best practice' - and hence 'competitive advantage' - of the firms involved. Essentially, Porter sees a cluster as a self-reinforcing system that stimulates the competitive strategies of the firms in the cluster and hence the 'competitiveness' of the cluster itself. He then argues that these processes depend in part on personal relationships, face-to-face

communication and social networks (social capital) so that "cluster theory bridges network theory and competition"(Porter, 1998, p. 226). He goes even further: "Clusters offer a new way of exploring the mechanisms by which networks, social capital and civic engagement affect competition" (op cit, p. 227). What is being proposed here, therefore, is nothing less than a general theory of clusters and their socio-economy.

Two questions immediately arise. First, to what extent it is possible to construct a universal theory of cluster formation, dynamics and evolution capable of covering the wide range of cluster types and processes thought or argued to exist, without degenerating into superficial generalities of the sort that have surrounded industrial districts (see Amin, 2000)? And second, just how far can the full complexity of economic, social and institutional factors and processes alleged to underpin cluster formation, development, and success, be reduced to or subsumed within an overarching concept of 'competitiveness'?

Consider the latter point first. In Porter's work the notion of 'competitiveness' is used to link a variety of conceptual scales: the individual firm, the industry, the regional or local business cluster, and the nation. For Porter, firms compete, clusters compete and nations compete. He talks of the 'competitiveness of locations' (see Porter, 1998). At the heart of Porter's 'theory of competitiveness' is his longstanding idea of 'competitive strategy'. He suggests there are three generic strategies that companies must follow to establish a lead in their market: differentiation (of product or service), cost leadership, and focus strategy (focusing activities on the needs of specific segments of the market). The role of clusters in this theory is that through concentrating the interaction between the elements of the 'competitive diamond' they enhance all three aspects of strategy. But while clustering may well enhance the competitiveness of firms, this is not the same thing as talking about the 'competitiveness of clusters or locations'. Locations obviously can not develop competitive strategies in this sense (though many policy-makers seem to believe they should).

In any case, several authors have criticised Porters' three generic competitive strategies as being too superficial, for lacking specificity, for being difficult to measure, and for not being as independent of one another, or as universally applicable, as Porter assumes (Miller, 1992; De Karre Silver, 1997; Segev, 1997). As Buckley, Pass and Prescott (1988) have shown, the notion of competitiveness is highly complex and in terms of process, management and measurement, varies with the economic scale at which the concept is being used. Indeed, yet other economists view the very notion of 'competitiveness' with extreme scepticism. They argue that while the term may have meaning at the level of the firm, it becomes increasingly more problematic as we move up the scale of economic aggregation (see, for example, Krugman, 1994, 1996: Turner, 2001). According to these authors, nations and regions do not compete with one another in the way that firms do. The analogy between a company and a nation or region is false. To suggest that nations and regions compete implies a sort of zero-sum game, in which one nation or region wins at the expense of another, whereas in reality trade should be seen as an exchange from which both benefit through the principle of comparative advantage.

Yet a further complication is that Porter's competitiveness theory of clusters is founded on the assumption that the important clusters are orientated to external trade. The focus on competitiveness only makes sense in this context. But what about clusters – and indeed other spatial economic agglomerations – in which the bulk of activity is orientated to satisfying local demand? Acccording to Krugman and Turner, contrary to what most discussions of globalisation imply, a far higher proportion of what is produced in a city or region is now consumed in that city or region than was the case, say, fifty years ago; a bigger share of economic activity occurs in local consumer and public services of all kinds whose output is consumed in that location; a smaller share is in the form of goods and services that are shipped to other cities, regions and nations (for example, Krugman (1996) estimates that only a quarter of Los Angeles' economy is traded). What matters for the prosperity of locations, cities and regions is

their productivity, or more accurately their productivity growth. And that, Krugman argues strenuously, has nothing to do with 'competitiveness'.

If there are difficulties with clusters in Porter's theory of competitiveness, the generality of his cluster concept compounds the problem. Clusters vary considerably in type, origins, structure, organisation, dynamics, and developmental trajectory, yet Porter's theory is supposedly intended to fit all. It is not clear, however, whether this is because it is assumed that all clusters can be explained in the same way, despite their diversity, or because the highly general nature of the theory is intended to cover all eventualities, allowing analysts to pick and choose different elements to suit different types of cluster. The difficulty is that Porter's cluster model actually combines ideas from quite different perspectives - from agglomeration theory to social network theory - some of which are complementary and others much less so. As a result, empirical observations of clusters and clustering can then be interpreted in quite different ways, thereby buttressing a generalised notion of the benefits of clustering by conflating elements for which there may actually be little evidence with elements to which the evidence more directly relates.

In response to this shortcoming, Gordon and McCann (2000), argue for distinguishing three main cluster models (theories). The first is the 'pure agglomeration economies' model, which they trace from Marshall through to modern urban economic theory, and which emphasises the external economies of geographical concentration. The second is what they call the 'industrial complex' model, in which clusters are seen primarily as the spatial counterparts of the input-output models of regional economics, as geographical concentrations forged by inter-firm trading links and the minimisation of transactions costs. And the third is the 'social-network' model, which as the term suggests interprets clusters mainly in terms of strong local networks of inter-personal relations, trust and institutionalised practices. Gordon and McCann argue that

> Defining analytically which of these types is the dominant structural characteristic of a particular cluster (or set of clusters) is essential, in order to be able to discuss their performance empirically, and to determine what more general lessons may be drawn from that (2000, p. 515).

They go on to suggest, for example, that the agglomeration economies model best explains the clusters in the London region in the South East of England (a result that suggests that they may be conflating economies of large-scale urbanisation with economies of localised agglomeration along neo-Marshallian lines)

However, this tripartite theoretical schema is not at all convincing. For one thing it fails to specify the particular circumstances, economic and spatial, under which one theoretical model should be more applicable than another. To be convincing, cluster theory ought to be able to specify *a priori* how different sorts of cluster are likely to develop under different conditions. Otherwise, explanation is reduced to a 'best-fit' exercise on a case by case basis.

Second, as Gordon and McCann themselves acknowledge, these three theoretical models are ideal-types. Each isolates a particular clustering mechanism, and effectively defines both the cluster type and its explanation in those terms. Of course, all models and theories involve isolation and closure, both of the object of enquiry and the causal mechanisms invoked, but the method and form of isolation have crucial consequences for how we represent and interpret phenomena. By setting up three ideal-typical cluster models, in effect Gordon and McCann are making claims as to what, in each of their cluster models, is essential and what is inessential, what is causally primary and causally secondary. But by their very nature, ideal-typical models never fit reality exactly, and in this case it is difficult to think of a pure agglomeration economies cluster, a pure industrial complex cluster, or a pure network cluster. While Gordon and McCann admit that a given cluster may contain elements of more than one model, nevertheless they insist that

> Contrasts in the policy implications of these three ideal types of cluster make it particularly important to avoid confusing features of one with those of another, even though elements of each may co-exist in particular situations (2000, p. 528)

In reality, we suspect, some degree of co-existence is likely to be common. And what are social networks in this context other than a particular form of external economy associated with agglomeration?

In the same way that Markusen (1996) has shown in relation to 'industrial, districts', the fact that clusters can apparently take on such a wide variety of forms and types raises critical issues of the usefulness of general theories, of the role and validity of 'hybrid' models, and particular explanations. Once again, the highly generic nature of the cluster approach comes at the cost of theoretical depth and precision. Indeed, much of the theoretical exposition on clusters is quite tautological and teleological in the sense that clusters are defined, *a priori*, as beneficial groupings of firms, and their existence is then explained in terms of these benefits. As the proposed benefits of clusters are argued to be cumulative, the outcomes of clusters can also used as explanations of their origins. The causal logic is collapsed into a blurred mixture of simultaneous cause and effect. As Storper (1997) rightly argues, this type of logic cannot explain why some agglomerations prove to be dynamic and adaptive while others do not. Not only does Porter's approach struggle to distinguish successful from non-successful clusters (Best and Forrant, 1996), it tells us very little about specific regional evolutions and their underlying causes.

Perhaps because of these confusions, there is an increasing tendency to explain cluster development in terms of the evolution of local knowledge and 'collective learning' (see for example Pinch and Henry, 1999; Hassink, 1997; Steiner and Hartman, 1998, 2001; Keeble and Wilkinson, 2000). The argument is that in a globalised economy the key resources for competitiveness depend on localised processes of knowledge creation and collective learning, in which people and firms learn about new technology, learn to trust each other, and share information. The

emphasis is on the role of 'tacit' as against 'codified' knowledge, in that the former is seen as more conducive to rapidly changing markets, and flexibly specialised innovative activity, whereas codified knowledge is equated more with standardised mass production type activity. Tacit knowledge, therefore, is viewed as depending crucially on localised face-to-face contacts and spillovers. Indeed, the assumed link between localisation and tacit or informal, uncodified knowledge is now almost accepted automatically (Breschi and Lissonie, 2001). And according to Leamer and Storper (2001) in the new information economy not only is the role of tacit knowledge increasing, but this in turn is accentuating the spatial agglomeration and localised specialisation of economic activity.

However, this local knowledge 'cluster theory' itself faces several difficulties. First, despite the numerous assertions that 'tacit' knowledge is the key to business success, this remains an unsubstantiated and obscure proposition. In any case, as several authors argue, the distinctions between different forms of knowledge are less clear cut and more fluid than simple distinctions such as formal and informal, codified and tacit, suggest (Amin and Condorcet, 1999; Breschi and Lissonie, 2001). Nor is it convincing to argue that a given form of knowledge is inevitably linked to one form of geographical socio-economic organisation (clusters) or any one scale of social relationships.

Secondly, many accounts refer to localised uncodified knowledge without making clear precisely what it is, or how it acts as a source of competitive advantage. More helpfully, Lawson and Lorenz (1999) argue that the key form of tacit knowledge may actually be embedded in firm routines, which guide a firm's innovativeness, problem-solving and adaptability. Ironically, however, the problem here is that the cluster literature, including Porter's own approach, lacks any serious analysis or theory of the internal organization of business enterprise (Best and Forrant, 1996). Instead, it emphasises the importance of factors external to firms. Thus the question of how firms can combine both co-operation and competition continues to remain unanswered (Enright, 1996). As the

industrial districts debate has shown, factors such as a co-operative public sphere or a communicative culture should not be seen as a collective resource which emerges from nowhere and can be tapped by all. Rather, such structures develop over time from the repeated contracts between firms and the risks taken by entrepreneurs (Lazerson and Lorenzoni, 1999; Cohen and Fields, 1999). In too many accounts local 'territorial learning' is privileged and its interactions with firm-based learning are left completely unexamined (Hudson, 1999). Related to this, and as May et al (2001) rightly argue, given the current fashion for non-economic explanations, cluster studies often assume that 'institutional thickness' refers to non-firm institutions rather than examining the key institutions of firms and labour markets.

Moreover, the cluster literature's account of this new 'knowledge logic' of competitiveness also appears somewhat contradictory. Porter presents clusters as integral to a new form of competitiveness in a global knowledge-based economy: in his words, "the configuration and the role of clusters seem to be taking on a new character as competition globalises and as economies become increasingly complex, knowledge-based, and dynamic" (2000, pp. 253-4). At the same time, it is increasingly argued that clusters are a significant feature of developing economies, and traditional 'survival' clusters of small enterprises in developing countries, such as footwear, clothing and woodworking, are also explained in very similar theoretical terms (see for example Fisher and Reuben, 2000). Again, these sectors are seen as dependent on high levels of social capital. Collective efficiency demands local co-operation and supportive governance by public authorities (Schmitz and Nadvi, 1999). In reality, such clusters are often based on low costs of production, low wages and have limited growth potential and low productivity. Porter (1998) himself argues that developing country clusters are 'shallow' and 'hierarchical' with only island-like competitive firms. In many instances they do not make convincing examples of a new logic of knowledge-based competitiveness, yet some of the literature explains them in almost identical social capital

and learning terms. The typical response to these tensions is to introduce yet another cluster typology; but the cluster species probably already has too many sub-branches.

Perhaps we are trying to take cluster theory too seriously. Perhaps we should just use the term more casually and descriptively, with little regard for its theoretical consistency and coherence. But the danger of such an approach is a deepening theoretical confusion and conceptual fuzziness. For example, on the one hand, Porter (1998) argues that clusters in advanced capitalist economies are not the result of urbanisation economies. Generalised urbanisation economies, in his view, are becoming less important as a source of competitive advantage, as they are more widely available across the globe. In contrast, Simmie and Sennett (1999b) argue that the multiple innovative clusters found in and around the London region are to be explained primarily in terms of urbanisation economies – the co-location of firms creating an effective demand for factors of production, particularly finance, qualified labour and technology (a not dissimilar argument is to be found in Gordon and McCann, 2000, article referred to above). In fact, the whole of the South East England region is highly urbanised and can be viewed as being driven by agglomeration economies with high rates of spin-offs in service industries (see Coe and Townsend, 1998). But if the South East's dynamic industries are based mainly on agglomeration economies rather than any new logic of cluster competitiveness, why then use the highly confusing terminology of clusters?

A further, and in our view fundamental, limitation of the current state of 'cluster theory' is that it isolates clusters from the rest of the economic landscape, and ignores other forms of regional and local economic development and growth. In other words, it fails to consider the dynamics of the inter-regional *system* as a whole, or the evolutionary trajectories and interdependencies of firms inside clusters relative to those outside clusters. In one of the very few attempts to take up this latter challenge, Pouder and St John (1996) draw on a range of theoretical ideas

(from institutional evolution, organisational ecology, management cognition, as as well as standard agglomeration economies) to construct an evolutionary model of the development of clustered *and* non-clustered firms. They propose that the economies of agglomeration that initially draw firms together into clusters eventually erode. The competitive strategies of firms in clusters, which are initially highly innovative compared to firms outside clusters, tend to converge (for example through mimetic and normative isomorphism) and to be less innovative over time because cluster firms define their field of competition as the cluster to which they belong, rather than as the wider external industry. This restricted collective perspective gives rise to competitive 'blind spots' which limit cluster firms' innovative potential, strategic positioning, and ability to anticipate and react to industry–wide shocks. Non-clustered firms tend to be less constrained and potentially remain more adaptable to sudden system-wide changes. In effect, these authors sketch out a theory of cluster formation, growth and decline, set against the background of the development of the wider industry as a whole. The very networks of interdependence that were a source of strength in the early phase of cluster formation and growth are hypothesised to become, over time, sources of inertia and inflexibility, relative to the firms outside the clusters. While Porter does refer to potential problems of cluster decline, Pouder and St John's theory assumes that relative if not absolute decline is an inherent systemic feature of cluster dynamics. Yet while their cluster theory represents an advance over Porter's in this respect, even their approach fails to consider the dynamics of cluster formation and obsolescence within a more holistic theory of uneven regional development. This is where, potentially, economic geographers could make a significant contribution; but unfortunately they seem to have all but abandoned their former interest in theorising the development of the economic landscape as a whole in order to focus too on particular types of region economy (invariably successful regional economies) in isolation from the wider inter-regional system as a whole.

4. Selective Empirics and the Cluster Creation Game

Obviously, a vaguely defined and theorised concept does not lend itself to easy or precise empirical delimitation. In fact, in most applications the geographical mapping of clusters is surprisingly unsophisticated and stylistic. Whilst Porter's diagrammatic 'flow diagrams' of particular clusters of (up-stream and down-stream) interlinked activities are often detailed, his 'cluster maps' are extraordinarily simplistic, and typically consist of lists of clusters (industries) by region or 'cluster circles' plotted in varying but meaningless sizes (for example, see his map of regional clusters of competitive US industries in Porter, 1998, p. 229). There is no agreed method for identifying and mapping clusters, either in terms of the key variables that should be measured or the procedures by which the geographical boundaries of clusters should be determined. Not only do different authors interpret and use the cluster concept in different ways, they use different types of data and different methods to identify them empirically. The result is that varying claims are made for how many clusters exist and what their geographies are. For example, while Porter (op cit) identifies and maps some sixty significant clusters in the US, according to the Secretary-General of the OECD, the US contains no less than 380, producing some 60 percent of the country's output (Johnston, 2001). Yet again, while Porter identifies a mere handful in the UK, others claim to identify several dozen (see Crouch and Farrell, 2001).

Empirical methodologies and 'mapping' strategies vary considerably. At one extreme are the 'top–down' national mapping exercises that utilise selective types of data to identify, on an industry by industry basis, particular important localisations of specialised activity or linked activities. At the other extreme are 'bottom -up' approaches that are only concerned with identifying clusters in a particular regional or local area, often in a highly qualitative, impressionistic way. In between are all sorts of combinations. Even top-down studies take different forms.

Following Porter's (1990) original major work on national competitiveness, an initial stage in constructing clusters adopted by some authors is to identify first those national 'core' industries that are 'globally competitive', usually defined in terms each industry's market share of world exports, or of world value added. National input-output tables are then constructed to determine the nature and extent of the trading linkages based around these 'core', globally competitive industries. Essentially, this approach to defining 'national industry clusters' seeks to subdivide the economy by forming industrial groupings (clusters) linked by particularly strong or distinctive supply-demand transactions. In other accounts, attention is focussed on some other subset of activities, whether they are globally competitive or not (e.g. high-tech industries). In yet others, all of a nation's industries are examined (see Miller et al, 2001; Crouch, 2001). Since inter-industry trade data are rarely available for sub-national geographical areas, in most top-down approaches the cluster mapping exercise itself typically reduces to the mapping of regional or subregional level data on employment and/or number of businesses in order to identify 'significant' geographical concentrations of the industry clusters being investigated.

The drawbacks of such analyses are obvious. Recall Porter's arguments that clusters typically cut across the sort of standard industrial sector classifications used to collect employment, output and related business data. Yet most top-down (and other) studies have no option but to use data based on such classifications. To compound the problem, census type geographical data on industrial employment and business populations are collected on the basis of pre-given administrative and political units - such as metropolitan areas and states in the US, and standard regions, local authority areas in the UK, or NUTS regions in the EU - which may bear no close relationship with the geographical boundaries or reach of clusters, however the latter are defined. Moreover, even with a given national context, the size of such regional or local data collecting units can vary substantially. If the spatial units are too large,

they can overbound and obscure local clusters. On the other hand, since the degree of local economic differentiation and specialisation tends to increase as the size of geographical units decreases, the use of small area data may exaggerate the number and significance of clusters.

Related to this last point, a further issue is that there is in any case no agreement on what degree of spatial concentration of an industry or industry group constitutes a cluster. Many studies employ location quotients to measure relative spatial concentration, and high values of location quotients are taken to indicate the presence of clusters. But although these make some adjustment for the varying size of areal units, they do not of themselves discriminate between the presence of a large number of small or medium sized inter-linked firms, and a large single firm employing the same overall number of workers. Associated data on the geographical distribution of individual businesses by size and sector are clearly essential. In addition, how much greater than unity does a location quotient have to be to indicate the existence of a cluster (see Miller et al, 2001)? In some studies, the statistical acrobatics employed to map 'significant' clusters are complex. For example, Ellison and Glaeser (1997) use a sophisticated probabilistic firm location model to devise indexes of agglomeration and co-agglomeration that control for differences in the size-distribution of plants and for differences in the size of geographic areas for which (employment) data are available, and which test whether the observed degree of agglomeration is statistically different from what would be expected from a purely random pattern of industrial location (the so-called 'dart-board' model). (They find, interestingly, that in the US almost all industries are somewhat localised, but that in many industries the degree of localisation is slight). In other studies, the 'rules' used to distinguish clusters are highly arbitrary (for an example, see the study by bCrouch and Farrell, 2001).

The extensive methodologies of top-down mapping exercises can at best only suggest the existence and location of possible clusters. They can not provide much if any insight into the nature and strength of local inter-

firm linkages (traded and untraded), knowledge spillovers, social networks and institutional support structures argued to be the defining and distinctive features of clusters. Thus a common tendency is to identify clusters in a piecemeal way and then deduce their benefits and effects from the co-variation and co-location of selected variables. There are two main reasons for this. First as Hanson (2000, p. 481) explains, "The externalities that contribute to spatial agglomeration, such as spillovers between workers, learning across firms, or cost and demand linkages between local industries, are difficult to observe. We are left to infer their existence from the covariance of observed variables such as wages, employment and output." This process of inference has produced some very mixed and inconclusive results, and even when covariance is found it is never precisely clear exactly what type of externality is responsible. Some analyses attempt to isolate only one type of externality and do not adequately control for other factors which may be affecting the observed locational patterns of activities (Hanson, 2000). For example, there has been a long-running and unresolved debate on whether localisation economies are conducive to higher productivity and employment growth, firm entry and innovation; or whether in fact urbanisation economies are more important and beneficial (see Henderson, 1986, Henderson et al, 1995; Glaeser et al, 1992; Feldman, 2000).

Given the problem of establishing the precise boundaries and composition of clusters, many studies take an easier route. That is, after making a theoretical case for clusters – or more usually accepting Porter's cluster arguments as correct - they take relatively large scale geographical units, such as states and regions, and make the highly contestable assumption that sectoral employment totals for these units provide a direct measure of the strength of cluster development in each location. Thus if a region is found to have a high employment total in computing, then it is assumed that it has a large computing cluster. For example, Baptista and Swann (1998) examine the introduction of manufacturing innovations across UK regions and conclude that a firm is more likely to

innovate if located in a region where the presence of firms in its own industry is strong, as measured by employment, so that clustering furthers innovation (see also Baptista, 2000; Beaudry, Brechi, and Swann, 2000). But to what extent can the strength of regional employment in a sector be taken as evidence of the existence of a cluster in that region? In response, Baptista and Swann (1998) assert that agglomeration benefits and externalities become stronger when the geographical level of analysis is reduced, so that using relatively large scale regional data biases against the relevance of spillovers and externalities. This may be so, but this surely does not mean that clusters necessarily exist in regions where employment in any one sector is high. A high regional employment total could surely just as easily reflect the presence of several large, dispersed and unconnected employers within that region. Furthermore, rather than establishing the industrial and spatial boundaries of clusters prior to testing, many of these studies use standard industrial classifications (such as SIC, NACE) to identify broad industries. But this is dependent on the assumption that clusters are geographical concentrations of related industries *within the same sector* (see Baptista and Swann, 1999). But as we have seen, this is not how Porter uses the term, and he repeatedly argues that standard industrial classifications are arbitrary and possibly misleading.

In view of these difficulties, it is perhaps not surprising that many studies give up on the idea of identifying clusters directly. Instead, they tend to rely on loose ad hoc means of identification (Doeringer and Terkla, 1995). This is particularly the case with many 'bottom-up' type cluster studies. Some analysts simply ask local authorities or economic development bodies to supply lists of 'local clusters' in their area which are then studied in more detail (for example see Van Den Berg et al, 2000). In many of these instances, however, what are claimed to be clusters often turn out on closer empirical inspection to be small and only loosely connected collections of similar or related firms, and sometimes have more to do with local political and policy aspirations than with realities on the

ground. Indeed, some cluster enthusiasts appear to eschew any prior empirical identification of clusters and, on the assumption that latent clusters are out there everywhere if only their constituent businesses, institutions, and agencies realised it, suggest the primary task is one of encouraging businesses, institutions and actors themselves to 'think in cluster terms'. Thus, for example, according to Cluster Navigators Ltd (one of numerous cluster consultancies and promotional bodies that have sprung up in recent years):

> Our experience is that *extensive analysis is not required to identify initial arenas* [ie clusters] for collaborative engagement [ie between cluster firms and policy-makers]. …The time for detailed analysis and systematic cluster benchmarking is *after* initial engagement has been obtained, *not before* (www.clusternavigator.com, emphasis added).

This putting of the promotional cart before the analytic horse is understandably attractive to cluster consultancies and public policy-makers eager to enter the cluster promotion game. No doubt many (and perhaps Porter himself) would be highly critical of our concern to put detailed analysis before promotion and policy, and would argue that excessive (academic) analysis only leads to policy paralysis; that the detailed structure and workings of a cluster will become obvious soon enough once we begin to think about an activity in cluster terms, however broad-brush and descriptive our initial characterisation might be. But to our minds, such arguments compound rather than circumvent the difficulties surrounding the cluster concept, its empirical status and its policy role.

They also render many of the claims about the superior performance of clusters of dubious validity. Clusters, it is argued, raise the productivity, innovativeness, competitiveness, profitability and job creation performance of their constituent firms, of the geographical areas in which the clusters are located, and thence of the wider national economy. Not only do clusters allegedly achieve all this, they would seem to offer policy-makers a convenient strategic arena in which they can

pursue their supply-side economic policies in a focused and integrated way .

But what is the evidence for these claims for the benefits of clusters? Some advocates assert that the economic advantages of clusters have already been empirically demonstrated (Baptista, 2000). Even the Secretary General of the OECD states that it has been shown that being located in a cluster raises the profitability of firms on average 'between two and four percent' (DATAR-OECD, 2001, p. 8). A more detached review suggests that the evidence is incomplete, and that far more detailed comparative research needs to be carried out to determine the precise extent to which, and the precise conditions under which, clustering does raise firm performance and innovativeness. Much of the evidence used in support of the superior performance argument is anecdotal and based on success stories about particular locations (Malmberg, 1996), and there are few extensive studies which document how common and important clustering is within particular industries (Malmberg and Maskell, 1997), or studies that carefully compare similar firms inside and outside of clusters.

One of the few such detailed studies, of metalworking across the US by Harrison and others (1996), actually found no evidence that firms in local concentrations adopted new technologies more rapidly than their more geographically dispersed or isolated counterparts. Likewise, in their study of the impact of clusters on firm growth and innovation for a range of industries across Europe, Beaudry, Brechi, and Swann (2000) found the results to be ambivalent. While firms located in clusters that were strong in their own industry tended to grow faster and have higher propensities to innovate, firms in clusters that were strong in other industries did not have faster growth and innovation rates. Moreover, it has not been conclusively shown that regions based on specialised clusters consistently enjoy a higher rate of economic growth (Steiner, 1998; Rodriguez-Pose, 2001). At the very least, the case that clusters invariably boost business performance and local economic development is not conclusively proven (Best, 2001).

Far from being the general rule and the key missing link in local competitive advantage, the benefits realised from geographical clustering appear to specific to certain industries at certain stages of development in certain places, and are only realised under particular conditions (Glasmeier, 2000). For example, Audretsch and Feldman (1996) examined the distribution of commercial innovative activity across the US and concluded that the propensity to cluster is itself greatest in industries with a high dependence on new economic knowledge, as captured by industry and university R and D, and skilled labour. Indeed, the dominant view is now that clustering is most significant in sectors that are dependent on tacit or informal knowledge, often in pre-commercialisation stages (Audretsch, 1998; Keeble and Wilkinson, 2000). But even within high-technology and knowledge-based activities, the significance of clustering has been found to be variable and produced by different processes. Thus, studies of computing in the US and the UK find that employment growth is promoted by own sector employment within particular states, and that firm entry is positively associated with regional employment in only a few subsectors, mainly hardware and components (Baptista and Swann, 1999). A similar study of US biotechnology, however, concludes that firm employment growth has been positively associated with own-sector employment but that firm entry in this case is attracted by the strength of the science base more than by own sector employment with a particular state (Swann and Prevezer, 1996; Prevezer 1997). The common message from studies of biotechnology and aerospace in the UK is that there are signs of clusters only in certain parts of these industries (Prevezer, 1997; Shohet, 1998;,Beaudry, 2000). There is no evidence that firms in some biotechnology sectors (for example related to food, chemicals, and agriculture) attract each other, possibly because large firms are able to absorb and internalise any knowledge spillovers. To complicate things further, a study of UK financial services, using the same methodology, found that own sector employment has promoted both employment

growth and firm entry, while other-sector employment negatively affects firm growth due to congestion effects (Pandit et al, 1999).

Given that there are so many different ways of identifying clusters, their advocates can always counter any disappointing results or criticism of their findings by insisting that the cluster boundaries or their economic outcomes have been incorrectly and inappropriately specified and measured. Ultimately, it seems that it is impossible to definitively support or reject clusters with empirical evidence, as there are so many ambiguities, identification problems, exceptions and special cases.

5. Cluster Policy: Hard Targets or Fashion Labels?

Despite these weaknesses, cluster promotion polices are increasingly popular and have been adopted by a host of local, regional and national authorities. Few other ideas can begin to rival the current popularity of the clusters notion amongst local economic practitioners and national and regional policy communities: "It is difficult to identify another equally obscure concept that appeals to such a broad spectrum of academic disciplines, professions and even lay people" (Bergman, 1998, p. 92). Given that there is so little empirical work which conclusively demonstrates that clustering actually produces increased local economic prosperity, this extraordinary popularity begs explanation. However, as there is no agreed and shared definition of what a cluster is, it is hardly surprising that there is no one single model for such policy. In many instances cluster labels are attached to quite different sorts of policies. As Feser and Bergamn (1998, p. 246) argue "The cluster concept is so broad and its connections to economic performance so multifaceted that it is often difficult to infer specific policy meaning from the typically broad and generalised cluster studies."

In terms of recommendations on best practice, however, there is a consensus that cluster promotion policies are unlikely to succeed in creating clusters *de novo* (Schmitz and Nadvi, 1999). Rather, they should somehow attempt to build on the potential already present in a particular

economy. While this seems sensible advice, it begs the question of what authorities should do if they lack the basis of embryonic clusters. Such a question is not just hypothetical, since it has particular relevance to debates on cluster promotion in lagging peripheral regions in developed economies as well to a wide range of developing countries. No convincing answers are given in the cluster literature. A typical response is to argue that there few if any regions that have no cluster potential, however limited that might be. Allied to this, one of the reasons why national governments seem so enthusiastic to embrace cluster policies is that they fit in well with a growing trend towards the decentralisation of policy responsibility and an associated emphasis on developing the indigenous potential of localities and regions. But here too, recommendations about the delivery of cluster policies also remain fairly vague and do not represent a simple blueprint. Enright and Ffowcs-Williams (2001) argue, for example, that the level of government best suited to providing cluster support policies should be that most closely matching the geographical extent of the cluster. However, as we have seen, cluster mapping is often much more problematic than it first sounds.

The standard rationale for cluster policies is they can help promote the supply of those local and regional public goods which are absent due to market failure (OECD, 1998; Scott, 1998). Four main varieties of such goods are usually identified. First, cluster policy emphasises the benefits of creating co-operative *networks and encouraging dialogue* between firms and other agencies. In such networks, it is claimed, firms can exchange information, pool resources, design collective solutions to shared problems and develop a stronger collective identity. Thus some cluster policies start by appointing brokers and intermediaries to organise these dialogues. This, it is suggested, can also yield a better co-ordination both between public and private agents and between different public agencies so that the impacts of different policy and regulatory measures on particular clusters can be monitored and managed (Lagendijk and Charles, 1999). Second, and related to this, cluster policies often involve *collective marketing* of an industrial specialism, based on place marketing

and raising awareness of the region's industrial strengths. Cluster policy typically represents a relatively cheap form of regional policy, but it is one that is able to raise the public relations profile of particular economies. Third, it is also argued that cluster policy should aim to provide local *services for firms* such as financial advice, marketing and design services. The firm extension centres in the US are often used as an example. A key recommendation is that local service provision should be targeted on particular industrial specialisms so as to ensure that it meets specific local needs. For instance, a widespread aspiration for some high-tech initiatives is to develop links with relevant university research facilities. The best practice in the provision of services to firms is apparently to provide subsidised or free services until firms learn to appreciate their value and then to switch to provision on a self-funding market basis. Fourth, it is argued that cluster policies should identify weaknesses in existing cluster value chains and *attract investors and businesses* to fill those gaps and strengthen demand and supply links. In some cases, marketing strategies should target particular types of investor who will add key pieces to the cluster jig-saw.

It is by no means our intention to argue that all of these measures are, in themselves, misguided and of no benefit to local and regional economies. However, what is dubious is whether setting and attempting to implement such policies within a cluster framework actually improves their effectiveness and outcomes. In many cases it appears that the cluster framework is either unnecessary or even constraining. The decentralised promotion of local indigenous economic potential certainly does not depend on a cluster approach. The first major problem inevitably encountered by cluster frameworks is how the boundaries of the relevant initiatives should be drawn. Which firms should be left out? How far up-stream and down-stream of the 'core' cluster activity should policies extend? There is a fundamental tension between the public policy desire to include as many firms as possible and the notion that policy interventions can be more cost effective and represent better value-for-money if they are targeted in some way. But if the policy is too targeted, then it starts to look

like old style industrial policy and too close to the discredited notion of 'picking winners'. The tension is nicely captured in this ambiguous advice by Enright and Ffowcs-Williams (2001, p. 5): "A policy on clusters should aim to provide services that all firms merit access to, whether they are clustered or not, but in a more targeted fashion." In the case of generic services, which would benefit all firms, it would seem preferable to drop the cluster framework all together. Moreover, is it really wise to exclude certain firms from 'institutional dialogues', particularly when the future course of local industrial and technological change is so hard to predict, and previously marginal firms can become key nodes in the local economy? Indeed, partly in response to this, Danish industrial policy has shifted to using the less exclusive notion of 'resource areas' (see Drejer et al, 1999). The linkages in wider and more diverse networks may well be weaker but they may provide greater long-run local adaptability (Grabher, 199*).

In most cases it is clear that, strictly speaking, most cluster policies do not identify working clusters, but rely instead on more immediately and statistically visible broad industrial sectors. Policy makers are clearly under pressure to find clusters in as many regions as possible for fear of offending some regional interests. The Sainsbury (1999) report on biotechnology clusters in the UK, for example, finds established biotechnology clusters around Cambridge and Oxford, but also identifies earlier clusters in the North West, Surrey, Sussex, Kent, the North East, the North West, North Yorkshire, Wales, London, Central Scotland, Wales; that is, in almost all regions of the country, even though in many of the latter the 'clusters' are small and lack the inter-firm linkages and spillovers that are held to be key cluster features. Likewise, in the DTI's more recent general investigation of business clusters across the UK (Miller et al, 2001) there is an obvious political tension between mapping significant industry clusters wherever these happen to be on the one hand (and many are in South East England), and ensuring an even spread between the various Regional Development Agency areas, on the other. Furthermore as Rosenfeld (2001) notes, there is also a striking similarity between the

clusters distinguished in many cluster initiatives. Partly in response, Feser and Bergman (2000) offer a national template in an effort to make cluster identification in the US more rigorous and feasible. But, in general, given the enormously practical difficulty of identifying working clusters and the inevitable ambiguities and complexities involved, it is asking a lot of local and regional public authorities to carry out detailed and intensive cluster investigations and analyses. Without these investigations however, it is impossible to identify weak links in existing value chains or to spot potential relations between firms that can be nurtured. Moreover, in the context of their typically limited resources, it is unrealistic to expect local and regional authorities to detect how different industries are developing and to anticipate the necessary service requirements. More generally, how should public authorities distinguish market failures in service provision? If firms are not paying for particular services, does this indicate a lack of information or a shared fear of free-riders; or is it because the services are not really needed?

Another important ambiguity in the literature is whether policy should aim to differentiate between different clusters and, if so, in what ways. On the one hand, Porter (1996; 1998) recommends that policy makers should not try to discriminate between clusters; rather, he suggests that 'it is not what you do but how you do it' that matters, and favouring some clusters is "bad economics". On the other hand, as we have already noted Porter (1998) argues in a neo-Keynesian manner that it is outward-oriented (export-based) clusters, rather than those supplying local demand, that are the primary long-run source of economic growth and prosperity. The underlying issue is that it is unclear whether and in what wayspolicy makers should respond differently to different types of cluster. For example, should declining clusters be treated in the same way as those which are growing? Research on clusters in Latin America reports that most are survival clusters of micro scale enterprises with limited competitive potential and concludes that appropriate policy responses have therefore to be quite distinctive (Altenburg and Meyer-Stamer, 1999). In such contexts there is surely a need to distinguish between clusters

according to their potential (Fisher and Reuben, 2000). A further issue is whether inter-firm collaboration is appropriate in all industries, and to what extent policies can promote both competition and rivalry, at the same time as furthering cluster dialogues and firm collaboration (see Enright. 199*). How are public cluster sponsors supposed to know when, and on which issues, to encourage knowledge sharing and exchange, and when to urge knowledge retention and proprietary secrecy in order to sustain innovation incentives and rewards?

In the context of these uncertainties and questions, it is increasingly evident that policy makers, seeking safety in numbers perhaps, tend to be drawn to promoting similar varieties of 'high-technology, knowledge-based' clusters. But, even assuming that the new knowledge economy has a coherent meaning, it is unlikely that all regions can rely on the same, high-skill, knowledge-intensive sectors. As Keep and Mayhew (1999, pp. 57-8) have argued

> While it is relatively straightforward to aspire to the high performance vision when it is applied to some sectors of the economy, it becomes a very much greater challenge when the focus shifts to the economy as a whole. Policy-makers need to guard against the dangerous tendency to seize upon leading edge practice located within a particular sector or competitive environment and then to assume that this can be, or indeed is being generalised across the entire range of economic activity.

Nevertheless, such generalisation or replication is precisely what Porter appears to be currently advocating. His present cluster mapping project across the US is expressly aimed at identifying 'best practice' in successful clusters as a 'blueprint' for promoting innovativeness and competitiveness across regional America as a whole. While successful clusters may well hold lessons for policy practice elsewhere, the idea that there are cluster 'blueprints' that can be readily implemented in quite different local economic, social and institutional contexts is highly debatable. Cluster policy texts also say little about how inter-regional, distribution issues should be approached. If one region implements a new cluster strategy

should this be allowed to undermine established clusters elsewhere or should regional clustering somehow be made complementary (DTI, 2001)? Porter (1996) argues that regional authorities should avoid "smokestack chasing" since using tax incentives and subsidies to bid against each other to attract key inward investors produces a zero-sum competition. Yet, in practice, cluster policies are surely likely to encourage such competition.

What is striking is that in much of the literature on cluster policies, there is no real reason why place marketing and the advertising of industrial specialisms really needs to be tied to a 'cluster' label of doubtful relevance and content. There is no reason why co-ordination between different policies and groups should be handicapped with a confusing cluster framework, or why the provision of demand-led, productivity enhancing services to firms would be improved by setting up some imagined cluster boundaries. Furthermore, there are many types of network policy which promote information sharing between firms which do not depend on a cluster framework and remit (see, for example, Cooke and Morgan, 1998). Indeed as Rosenfeld (2001) argues, what has happened in actual fact is that many local authorities have backed into cluster initiatives from pre-existing network support programmes.

It is also important to recognise that there are several potential dangers associated with promoting clusters (see Table 2). First, cluster policies are often based on an exaggerated view of the extent to which firm performance is determined by its local context. For instance, Porter (1998) claims, "The presence of clusters suggests that much of competitive advantage lies outside a given company or even outside its industry, residing instead in the *locations* of its business units"(p. 198). But this is over-generalised. If a company suffers from poor management, culture and practices it is hard to believe that it can rely on the competitive advantage of its location. While internal and external advantages are clearly not independent, it seems ill-advised to argue that "There is a need for firms to adopt new strategies: instead of an individual 'search for excellence' they have to go for a co-operative approach because 'as a group we are stronger'"(Steiner, 1998, p. 4). While supporting institutions

and a networked semi-public sphere may often be necessary for innovative and dynamic firm performance, such factors are unlikely to be sufficient.

Local and regional specialisation also represents a risky strategy. At one point, Porter argues that as economies develop they tend to specialise and rely on a smaller number of fewer, deeper and more sophisticated clusters. Elsewhere, however, he argues that the most important new departures, which frequently revive local competitiveness, come at the intersections between clusters. But if cluster numbers are declining over time, these radical departures will also be less numerous. The risk of decline and profound instability in specialised regional economies is well known and its relevance has been underlined by the recent downturn in Silicon Valley. Economic landscapes are littered with local areas of industrial specialisation that were once prosperous and dynamic but have since gone into relative or even absolute decline. Porter himself argues that the causes of decline can be both internal to the cluster and the result of radical changes in external conditions, such as technological discontinuities. Internal decline will be rapid if the cluster suffers from the lock-in of established ways of thinking and doing things, and there are some authors who suggest that a reliance on local face-to face and tacit knowledge do indeed make local networks of industry especially vulnerable to lock-in (Amin and Condorcet, 1999). Clustered firms may be capable of incremental and continuous improvement within certain parameters, but may be unable to adapt to radical shifts in technology and product (see Pouder and St John, 1996; Loasby, 1998). None of the swelling ranks of cluster adherents seem to explain how policies should respond to these dangers. Fritz et al (1998) argue that policy makers should see local industrial specialisation as having a risk-return trade off, plotting the risk of ossification against the higher returns gained from clustering (a point made years ago by Conroy, 1975, in his study of regional specialisation versus regional diversification). The difficulty is that while we know what the risks are, the case for higher returns is unproven.

Table 2. Clusters have Costs as well as Benefits

Claimed Advantages	Potential Disadvantages
Higher growth	Labour cost inflation
Higher productivity	Inflation of land and housing costs
Increased profitability	Widening of income disparities
Increased competitiveness	Over-specialisation
Higher new firm formation	Institutional lock-in
High job growth	Foreign take-over

A further risk related to clusters concerns that of localised inflation and 'overheating'. The cluster literature itself tends to downplay the importance of cost-based competition. To quote Steiner (1998) again: "The existence of clusters is the decisive element for the competitiveness of regions and nations, not cheap land, labour, or energy, nor even high subsidies and low social costs, nor even high technology strong and leading industries" (p. 4). Other more cautious sources express concern about the effects of clusters on local costs. For example, a DETR (2000) report on clusters noted that the growth of industrial concentrations tightens the labour market, leads to increased congestion and puts pressure on the housing stock. It adds, "There is a real danger that the unplanned growth of a cluster may destroy the very features conducive to the development of the cluster in the first place"(p. 12). And "Firms with lower margins may be forced out of the area and workers on lower incomes, perhaps working in essential services or sectors which support the cluster, find it more difficult to find affordable housing" (ibid.). The report suggests that planning authorities should manage these constraints and act to facilitate geographic dispersion as clusters mature. The question of the impact of cluster growth on other local sectors of activity is unresolved, however. The cluster orthodoxy would presumably be that as costs rise in the cluster, less productive firms are either put out of business or move away. In Porter's view "Rising local wages and profits reflect economic success. This means that less skilled and less productive activities *should* move to other locations" (his emphasis) (p. 245). However,

if these firms are labour intensive this would have a large negative impact on the local labour market. There is no theoretical guarantee that the high-productivity growth firms will be able to absorb the excess labour. Those working within the 'core' cluster firms in a locality may enjoy high living standards and rising wages as a compensation for the growing congestion, while those in non-core activities have to make do with inferior real wages and living standards, or have to move away. It cannot, therefore be assumed that the promotion of one or several clusters within a regional economy leads to balanced economic development, or greater competitiveness, or greater well-being across the entire region. Rather the outcome will depend on how the cluster affects the costs and employment of others sectors (Venables, 1996). Thus the competitiveness of a local economy cannot be equated with the strength of particular industrial concentrations even if these form a core component of the local economy.

Given these potential disadvantages, it would seem more advisable for local and regional authorities to concentrate on encouraging productivity improvements in all local firms, as well as improving their business environments, without committing to a cluster mind-set. The danger of a cluster-based approach to policy is that it detracts from the need to take a more holistic view of regional development. It is likely that dynamic regions will produce networks even without government incentives (Rosenfeld, 2001). It is also noticeable that many of the examples of public initiatives, supposedly illustrating successful clustering strategies (such example in the City of London), have a long history that far predates any use of cluster terminology or explicit cluster strategies. Further, as Porter (1998) himself rightly emphasises, many of the most significant influences on industrial development stem from the way in which national regulatory frameworks influence the demand for sophisticated products and hence the course of industrial innovation (also DTI, 2001). Such regulation, along with the quality of the economic and social infrastructure, may well represent a better focus for policy makers' attention. At its best the current policy preoccupation with cluster

strategies looks like a fad for a fairly imprecise and flexible label for differing combinations of measures.

6. Conclusions: The Cluster Brand?

Constructing a critical review of clusters is a difficult task. There are now so many different varieties of clusters and so many confusing claims about their theoretical basis, form, identification and significance that the concept is peculiarly elusive and hard to pin down. The feeling that there must be 'more to it than this' is endemic. The cluster literature is a patchy constellation of ideas, some of which are clearly important to contemporary economic development and some of which are either banal or misleading. But there are two key limitations that we wish to emphasise in conclusion. First, a concept so elastic as the cluster can not provide a universal and deterministic model on how agglomeration is related to regional and local economic growth. At present the siren of universalism is pulling the cluster concept into shallow waters. It is being applied so widely that its explanation of causality and determination becomes overly stretched, thin and fractured. Second, and related to this, economic geographers and other regional analysts have long been aware that just because there is an association between some high-growth industries and various forms of geographical concentration does not mean that this concentration is the main cause of their economic growth or relative success. The empirical case for clustering remains in its infancy and repeatedly makes the mistake of jumping from particular associations to general causality.

But this heterogeneity and chaos is only half the story. It would be tempting to conclude that the notion of clusters has no real significance. Yet this is clearly at odds with the enormous policy popularity of the notion and the generous tolerance granted to the idea by a usually critical academic community. The answer to this paradox may lie in the way in which the cluster concept has been *marketed* by Porter and other enthusiasts as a *brand*, rather than just another intellectual product. Just as

large corporations use branding to distinguish their products from other largely indistinguishable products (for example see Klein, 2000), so the 'cluster brand' has been much more successful despite the existence of many similar theories and policy recommendations of industrial agglomeration. It has certainly attracted many more 'buyers' in the policy and practitioner markets than its rivals. The reason appears to lie not so much in the theoretical or empirical superiority of the concept but in the way in which it has been branded or closely tied to a set of positive images and associations. Again, just as branded products are ultimately image-based so that consumers come to associate them with rewarding lifestyle experiences, the cluster brand at its core is based on am image of a high-productivity, knowledge-rich, decentralised, entrepreneurial and socially progressive economy within the reach of local policy-markers (a regional version of the American Dream, perhaps?). And just as brands are not confined to particular products but can exploit synergies between them, so we should expect the cluster idea to act as an umbrella brand for many different things. The core meaning of clusters lies more in this image than in a coherent and carefully defined set of ideas.

In short, Porter's cluster idea displays all of the key features needed for such a metaphor to assume the power of a successful 'brand' (or even myth – see Harfield, 1998). First, the metaphor must accord with some strong, if not always clearly defined, aspirations – in this case promoting innovation and competitiveness. It must be expressed in language sufficiently flexible as to permit a wide range of interpretations – in this instance, the hybrid nature of the cluster concept. The metaphor must have authority – here, Porter's 'expert knowledge' on competition and business strategy. It must be capable of continual and consistent re-invention and re-application – Porter's cluster concept is itself the latest stage in his evolving theory of competitive advantage, now being actively applied to the latest phase of economic development , the so-called new knowledge economy. And the language of the metaphor must allow the possibility of providing practical action – the cluster as a policy tool.

It is as if, in effect, Porter has applied his theory of competitive strategy – of strategic positioning – to his cluster idea itself. Clever positioning and marketing of the cluster idea have been extremely influential in selling it to policy-makers the world over. In adopting the cluster idea, policy-makers purchase the 'Porter brand', and in doing so serve to reinforce the brand's prominence. What this implies, of course, is that given the power of the 'cluster brand', academic critiques such as this one are unlikely to have much of an impact on the concept's popularity. It is perhaps only as the actual limits to 'brand-based policy making' emerge, along with the marshalling of careful evaluative research, that the grip that Porter's cluster idea currently exerts on analytical and policy circles will lessen. As Santayana reminds us (in the quote at the beginning of this paper), fashionable ideas tend to share one thing in common: they all eventually become unfashionable.

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