

## Introduction

by Åge Mariussen

This report deals with regional development and knowledge governance in the context of new conditions of competition, characterised by globalisation and interactive learning as a basis of innovation. In the past, different types of policies aimed at raising the general level of education of the workforce and promoting linear applications of scientific knowledge through university and industry hierarchies, according to a *hierarchical* principle of knowledge governance.

In the *new learning economy*, different market-based and co-operatively based knowledge governance mechanisms co-ordinate interactive learning and innovation. These mechanisms are poorly understood, and our ability to use them for political purposes is weakly developed. In exploring some of these mechanisms, the concepts of *clusters* and *enhanced clustering* can serve to explain both the dynamics and future potential of regional development.

Experiences with *cluster policies* are mixed, however. This is partly due to institutional inadequacies, partly to our insufficient understanding of appropriate knowledge governance under the conditions of the new economy.

### A New Paradigm, a New Economy

The new paradigm of localised, small and medium-sized firm-based economic development which was reported in Becattini's classical article on the Northern Italian districts in 1978<sup>1</sup>, is by now a matter of common knowledge and widespread policy action. It heralded the organisational form of new economy sectors which are characteristically knowledge-intensive if not always necessarily high-technology. The new economy is a learning economy, where the successful integration of *new* knowledge for economically useful purposes is a key to the explanation of economic competitiveness. This is closely related to a series of arguments, like ubiquitous theory, tacit and "sticky" knowledge theories, theories of interactive learning and innovation systems - as well as Porter's cluster theories<sup>2</sup>. These theories have been nourished by

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<sup>1</sup> A later (English language) contribution is Becattini (1990) "The Marshallian Industrial District as a Socio-economic Notion", in Pyke F. et al. (ed.). *Industrial districts as inter-firm co-operation in Italy*, International Institute of Labour Studies, Geneva, 37-51.

<sup>2</sup> A comprehensive summary discussion linking several of these theories with Porter is made by Asheim, B.T. (1999) "Innovation, social capital and regional clusters: on the

political-administrative institutions whose central actors, for various reasons, seem delighted to be able to do something intended to promote economic development and global competitiveness, in particular the OECD, EU and a number of European governments<sup>3</sup>. The reasons for this are quite obvious: international regulation - not only of competition, but also of monetary policies - combined with rapidly increasing global economic integration and the ICT revolution have created an entirely new situation. This situation has two striking characteristics: new and harsher terms of economic and technological competition *combined with* a loss of many of the standard policy measures we used to apply to these phenomena in the past.

In this new context, the ideas of the learning economy and cluster policies link directly into readily available policy measures, including investment in education, research and networking to promote innovation. These measures are not constrained by regulations of competition, nor removed through the abolition of national currencies. They are ideally suited for EU regional development policy in the Structural Funds, where the learning regions strategy has long been mainstream policy. In short, these theories are an obvious *solution* to the problems created by the new competitive situation in the globalising economy. What is more, these solutions are *visible* political action, aimed at promoting employment and economic development while at the same time mobilising regions in competitive games. In short, *they lend themselves ideally as political projects*. Nor are they without historical predecessors.

### **What the Sputnik Did to Us All**

During the Cold War, education was seen in the context of “the battle of production” between the “Free World” and the Soviet Union. If we go back, not to 1978, but to 1957, the Sputnik in orbit gave the Free World a deep shock. If the Soviets really had an industrial base capable of launching the Sputnik, what was next, better fighter planes, tanks - or better cars? Why were the Soviets first? For Cold War political and ideological reasons, this could not have anything to do with the political system or industrial organisation. There simply had to be another answer: The Soviet educational system and the level of education in the workforce lent itself easily as an alternative explanation. And

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importance of co-operation, interactive learning and localised knowledge in learning economies”, Paper presented at the RSA Conference in Bilbao, September 18-21. See also Malmberg, A., Sölvell, Ö. and Zander, I. (1996) *Spatial clustering, local accumulation of knowledge and firm competitiveness* Research paper 96/7, Institute of International Business, Stockholm School of Economics.

<sup>3</sup> For a policy related version of this debate, see Lundvall, B.Å. and Borrás, S. (1999) *The Globalising Learning Economy, Implications for Innovation Policy*, Office for official publications of the European Community, Luxembourg.

indeed, available statistics confirmed that the Soviet Union did show a higher level of education as compared to the Free World.

The human capital theory, which was promoted in the late 1950s and early 1960s, explained economic growth as emerging from “investments in humans”, which by and large were understood as formal education with certification. In the context of the time, this perspective on education was new, as education had usually been regarded as consumption, not investment, and the workforce was, in most economic models and theories of the time, regarded as a homogenous factor of production. Investment in humans through education resulted in human capital which was both an asset for the national economy, enhancing the quality of the workforce, as well as capital, which could be used and sold by its owner, the individual worker. A theory proposed by Schultz suggested how to create growth *in general*, but also how to reduce inequalities, by investing human capital among lagging nations, regions or individuals.

The problem, according to Schultz, was under-investment, due to certain imperfections of the market for knowledge. These under-investments could be compensated for by government policies.

The theory led to the recommendation of new macro level policies which increased national spending to raise the level of education of the population in general and the workforce in particular, as well as educational programmes targeting the under-privileged. These theories were disseminated very efficiently to central political audiences in the USA and on a global scale through OECD<sup>4</sup>. The “knowledge economy” that emerged on the frontline of the “Battle of Production” in the Cold War was based on a *linear* learning perspective, and a corresponding *hierarchical* perspective of knowledge production. The western states invested by expanding university budgets, western universities produced knowledge, and the well educated labour coming out of the universities were primarily rewarded for their skills in the segment of the labour market created by the modern, Fordist, large-scale corporations. Here, the well educated swelled the ranks of the industrial administrative hierarchies, and production, so the story goes, was directed by scientific theory.

All of this, it goes without saying, was closely correlated with technological and industrial development, not only within the military-industrial

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<sup>4</sup> Schultz, T.W. (1961) “Investment in Human Capital”, Presidential Address delivered at the Seventy-Third Annual meeting of the American Economic Association, St.Louis, Dec. 21 1960. This had been said before, by Adam Smith and Alfred Marshall. In USA, the Cold War context of educational policy went back into the 1940s and the experiences from the arms race during the Second World War, where the US and UK proved better than Germany in linking sciences and weapon industry, see Karabel, J. and Halsey, A.H. (eds.). (1977) *Power and Ideology in Education*. Oxford University Press.

complex and in the space industry (another area of somewhat more peaceful global competition of the time), but also in consumer goods and all the modern infrastructure which supports such production. These were the golden days of Fordist success, when a combination of growing mass consumption, and expanding standardised mass production, organised in large-scale firms, contributed to an extended period of full employment, and an unprecedented growth in the standard of living.

Another outcome was, quite paradoxically, a rapid growth of Western Universities, which culminated in deep social unrest among students, represented in the widespread protests of 1968.

Many positive developmental opportunities arose from this. Without the space race triggered by Sputnik, not to mention nuclear research at CERN, the World Wide Web might have remained only an idea. Miniaturisation associated with space research clearly led to the microprocessor, desktop computing, e-mail and the Internet. Along with mobile telephony, now convergent with computing and Internet access these comprise the contemporary information and communications technology (ICT) revolution. Furthermore, without the heavy investments in Western universities in the 1960s, initiated and legitimised by human capital theory, neither producers nor consumers would be as diversified yet integrated a market as we experience today.

### **The New Learning Economy**

Our contemporary learning economy differs from this modern, Fordist learning economy in three respects:

#### *New Types of Knowledge Scarcity*

As pointed out by *ubiquification* theorists, the logic of competition in terms of human capital in the Fordist period was to a large extent a question of creating competitive advantages based on differentials in the general formal educational level of the workforce. Today, the general level of formalised education is considerably higher in large parts of the world. Formalised knowledge is increasingly mobile and people with formalised education can, with certain important exceptions, be regarded as available everywhere. The point made by *ubiquification* theorists is that this means that knowledge which is *not* formalised, tacit knowledge generated through “learning by doing”, as well as unique, “sticky” mixtures of tacit and formalised knowledge, is a new source of scarcity, decisive to competition between regions and nations. It is important to remember, however, that the availability of all types of formalised, scientific knowledge cannot be taken for granted. This is the case for cutting edge research, where scientific knowledge is not yet formalised, reported, and generally available. There are also scarcities of several types of not-so-new, formalised knowledge, in particularly knowledge useful to new growth

industries. Regional pockets of formalised knowledge which is in short supply may well merge with tacit knowledge to form unique, sticky bundles, creating new competitive advantages for specialised regions.

#### *New Forms of Technological Competition and Development*

Major Fordist industries, by and large, followed paths of technological development which were relatively homologous with the division of labour between sciences and specialities in the Universities and educational institutions. Today, more complex products and technologies require contributions from broad ranges of specialised knowledge and science. This is, among other factors, driven by the deep interpenetration of certain generic technologies, like IT, material technology, and bio - technology into a broad range of new areas. The car industry is a good example. Building cars used to be about mechanical engineering, and using them was definitely a relation between man and mechanics. Today, operating a car means interfacing with its computer system. The relation between achievement on the road and energy consumption of a modern car can only be explained by the use of new material technology. This need for increased interaction create increased need for the ability to, as Asheim points out in his article in this report, with a reference to Laestadius, *synthesize* different forms of specialised knowledge.

#### *New Forms of Knowledge Governance*

The two factors above leads to a crumbling down of the *hierarchies* of knowledge governance that characterised Fordism. Instead, two new, partly complementary, principles of knowledge governance emerge: reciprocal co-operation and market based co-ordination. The relation between hierarchy, market and co-operation can vary. A synthesizer organising a project with different specialists may have a dominating market position, which may be used to organise the project hierarchically. But the interactive logic of innovation also creates dialectics of power, undermining hierarchies. At some point, the synthesizer simply has to trust a specialist who controls a craft or science the synthesizer does not know. This opens the way for more horizontal relations with outcomes which are open-ended and market oriented <sup>5</sup>. Some horizontal relations may be seen as reciprocal, co-operative and informal: different people with different specialisations share their knowledge because in doing so they create common goods. However, new, interactive, market based relations may be synthesized through projects.

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<sup>5</sup> This point was made forcefully by Piore and Sabel in 1984, as well as in a number of later contributions from Sabel (Piore, M. and Sabel, C. (1984) *The second industrial divide: Possibilities for prosperity*. Basic Books, New York.

The emerging *project economies* mean that imperfections of the knowledge market, which Schultz described in 1961, disappear.

### **Universities – Markets: Shifting the Balance**

As market imperfections crumble, so do the hierarchies of knowledge management and production created in the battle of production of the Cold War. This is a painful process, because it entails an entirely new, interactive perspective on knowledge, at odds with the logic of the industrial hierarchies, as well as the linear perspective on learning we find at the Universities. A testimony of the pains of this deep institutional transformation is found in a text published in 1984 by an early philosopher of postmodernism, Jean Francois Lyotard <sup>6</sup>:

“It is not hard to visualize learning circulating along the same lines as money, instead of its ‘educational’ value or political (administrative, diplomatic, military) importance; the pertinent distinction would no longer be between knowledge and ignorance, but rather, as is the case with money, between ‘payment knowledge’ and ‘investment knowledge’ – in other words, between units of knowledge exchanged in daily maintenance of framework (the reconstitution of the work force ‘survival’) versus funds of knowledge dedicated to optimizing the performance of a project.” (p.6)

Lyotard’s distinction between ignorance and knowledge fits very well with the *linear* perspective implicit in the policy recommendations made by Shultz in 1961, and the *hierarchical* mode of knowledge governance of the Cold War. But, as Lyotard pointed out to his readers in academia, this perspective on knowledge was vanishing. Today, Lyotard’s *moral indignation* seems like a distant remnant of times long gone while his *vision* of the emerging new economies of knowledge is an accurate, prescient description of the learning economy of the 21<sup>st</sup> century. As reflected in Lyotard’s scepticism, this interpenetration of market relations into what used to be a sacred temple of knowledge production, the Universities, may be painful to some of the residents of the temples.

What was described as the “postmodern condition” in 1984, is today taken for granted, as investors in knowledge are themselves apparently becoming ubiquitous. Indeed, as the exponential yet uncertain growth of NASDAQ suggests, the new economy is characterised by the ubiquity of

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<sup>6</sup> Lyotard, J.F. (1993) *The Post-Modern Condition*, a report on knowledge, Minneapolis. University of Minnesota Press.

financial investment capital pursuing the scarcity of knowledge capital leading to dangerous, speculative over-investments in human capital, particularly in the more expansive parts of the new economy, such as e-commerce and biotechnology.

It seems as though important *investment decisions* are not only, perhaps not even primarily, made at the macro level of national educational policy, but on the contrary by the entrepreneurs, financiers, co-ordinators and synthesizers of the new project economies, where different forms of knowledge are combined and recombined because new combinations are useful for some global market niche<sup>7</sup>. This is not, as implied by the concept “postmodernity”, the end of development and rationality. Looking beyond the rather narrow cultural horizon of the ironic, but no longer young, writers of “post-modernism”, new economy appears as another type of modernity, but still modernity, as new forms of development, but still development, and, most importantly, as new forms of learning and knowledge production, but still learning and knowledge production.

But surely, this deep transformation must be uneven? The new *knowledge markets*, where the imperfections defined by Schultz in 1961 are withering away, do not appear anywhere, just by themselves. As we all know, markets are socially and culturally constructed; they tend to emerge first in certain geographically and structurally defined localities where conditions are optimal. In this context, Porter’s cluster concept, and the rich, empirically informed literature on clusters, is enlightening. Clusters may be seen as one form of the emerging, local markets of the new knowledge economy.

### **Clusters: Local Markets in the New Knowledge Economy**

The cluster concept has gone through a remarkable transformation since it was launched by Porter in 1990<sup>8</sup>. In Porter’s original definition, the concept was based on analysis of a number of national economies. His discussion linked nicely and policy-user-friendly into a number of national policy recommendations and measures. In Porter’s later articles <sup>9</sup> (Porter 1998) the cluster is redefined to encompass a regional rather than a national level. He is no longer concerned with external, but on the contrary with *locatioal economics* (Asheim 1999). In an article in this report, Asheim analyzes what he calls the “knowledge infrastructure” of branches and regions. It is this infrastructure, he claims and not the knowledge base of firms, which is involved in innovation:

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<sup>7</sup> as Schumpeter showed (in *Capitalism, Socialism and Democracy*).

<sup>8</sup> Porter, M. (1990) *The Competitive Advantage of Nations*. Macmillan, London.

<sup>9</sup> Porter, M. (1998) “Clusters and the New Economics of Competition”, *Harvard Business Review*, Nov.-Dec. 77-90.

“Knowledge infrastructures are thus constituted by a variety of institutions and organisations such as universities, other R&D institutions, training systems, production knowledge of firms etc., ‘whose role is the production, maintenance, distribution, management, and protection of knowledge.’” (Smith 1997, 94-95)

These knowledge infrastructures are obviously important breeding grounds for market-based knowledge management. In the discussion of clusters in Philip Cooke’s article in this volume, this discussion is expanded and clusters defined as:

“Geographically proximate firms in vertical and horizontal relationships, involving a localised enterprise support infrastructure with a shared developmental vision for business growth, based on competition and co-operation in a specific market field.”

Thus, clusters combine specific industrial relations, embedded in societal and organisational aspects:

- Shared identity and future vision;
- Characterised by spin-off, spin-out and start-ups;
- Located in arenas of dense and changing vertical input-output linkages, supply chains and horizontal inter-firm networks;
- Likely to have third-party representative governance associations that provide common services and lobby government.

These are societal, cultural and regional economic elements explaining the local knowledge-market dynamics of the cases he presents, explaining three *advantages* of clusters:

1. *Productivity* gains arising from access to early use of better quality and lower cost specialised inputs from components or services suppliers in the cluster;
2. *Innovation* gains resulting from the proximity between customers and suppliers where the interaction between the two may lead to innovative specifications and responses;
3. *New businesses*, formed due to locally available information about innovative potential and market opportunities.



Whereas advantage 1 is related to transaction cost economics of proximity in the traditional sense, innovation and business formation gains are obviously important outputs of the local capacity to stimulate interactive learning. Another crucial factor, which is important in the cases and examples Cooke discusses, is a well-known aspect of knowledge infrastructure: proximity to universities. Cooke's cases illustrate developing clusters, where advanced universities and research institutions are becoming embedded in societal, cultural and industrial contexts. Not surprisingly, he finds a soil that is extremely fertile and open for interactive learning and knowledge markets in emerging sectors of new economy, like biotechnology.

#### *But Surely, the Soil May Vary?*

The article by Franz Tödting focuses on Austrian clusters, based on mature, modern industries of the old economy, promoted through regional level policies. In Styria, which was a pioneer region in terms of cluster development policies in Austria, Tödting discuss two interrelated clusters: the older industries of materials and metals, characterized by restructuring, as well as the newer rail-automotive industry cluster. These clusters are impressive industrial agglomerations, with advanced knowledge infrastructures, supported by visible, high profile cluster policies. In addition, Tödting identifies Upper Austria as a "smart follower", in terms of cluster policies, based on newer and "thinner" car industry agglomerations. The automotive cluster was the main policy focus both in Styria and Upper Austria.

Tödting outlines a paradox: whereas high-profile cluster policies at the regional level can claim to be a success, the actual innovative outcomes of Austrian clusters still remain to be seen:

"The most important effects so far seem to be the marketing of the region(s) as well as the upgrading of local SMEs as suppliers of larger firms (knowledge transfer). There were steps towards interactive learning and innovation, but to what extent there are substantial innovation networks still has to be investigated."

#### **Italian Clusters: Reciprocity and Localised Learning in the Districts**

In the article by Chiarvesio and Micelli, the point of departure is, again, completely different: the industrial districts of Northeast Italy. Here, the logic of knowledge management is different from both that of hierarchical, firm-led economies, as well as the emerging project economies. In the districts, knowledge is craft-based and embedded in local, specialised districts on a reciprocal basis. This is a horizontal, but not market-based, mode of knowledge governance. Thus, the districts represent an alternative path of development

which, by a combination of favourable historical circumstances, was able to bypass the strategy outlined by Schultz. As is clear from the literature emerging during the last two decades, this alternative not only proved to be strong in terms of economic competition, it also functioned as an important source of inspiration in breaking away from the Fordist solutions.

Chiarvesio and Micelli point out that social embedding of knowledge is strictly linked to the *local* context:

“The success of industrial districts comes from an organizational and production model based on a network of flexible relationships strictly linked to the local economic and social context. The local context, where work and social life overlap, is the place where the collective identity is produced and reproduced, the mutual trust is reinforced, and a flexible and effective network of economic and cognitive relations that supports the knowledge creation and diffusion processes is strengthened. These relational features of industrial districts led to a deep division of labour within local boundaries in favour of the specialization and qualification of specific local expertise. At the same time, they allowed enterprises to maintain a high level of flexibility in the market.”

Today, the industrial districts are facing globalisation, bringing formalisation and market relations, replacing the former embedded, informal relations and opening up what used to be strictly local investment to FDIs. Chiarvesio and Micelli report on a project based on the idea that

“The transition from local to global (Becattini, Rullani 1993), in our opinion, cannot be separated from a wide and diffused investment in information and communication technologies.(...) we do not believe that a global network can actually be realized without the support of a technological network; this would not only be a solution for challenges that the market is issuing to industrial districts, but also an opportunity to enhance the district model, emphasizing local expertise and taking advantage of the best of global economy.”

Their hypothesis and findings, which confirm the informal and closed local character of interaction in industrial districts, are referred to in the report presented in their article. This research illuminates the differences and similarities between the market-based knowledge economies of the clusters and urban agglomerations, and the territorially based logic of reciprocity and co-operation, where skilled craftsmen, sharing a local identity, also share knowledge as a common good.

One might speculate as to whether globalisation can open the way for more formalised and market-based organisation of interactive learning in the districts, in the form of projects, and reduce the significance of local reciprocity? It would be surprising if the districts did not find alternatives, where their unique advantages in terms of social capital can be further exploited.

### **Nordic Clusters and Cluster Policies**

Asheim<sup>10</sup> has pointed to the significance of *regional development coalitions* in promoting clustering, substantiated through studies of Norwegian regional innovation systems<sup>11</sup>. Asheim emphasizes the significance of *social capital*. And indeed, in the construction of the development coalitions he describes, the significance of trust, openness, exchange of information and co-operation is quite explicit. But as we all know, production of social capital is not a feature of a formalised organisational system, it is instead a potential achievement of an inter-personal network. Institutionalisation emerges through time, driven by the practices of people working in these organisations; it is not something which can be copied by copying formal the organisational arrangement somewhere else. Social capital is not a ubiquity. But realising this, also makes it quite obvious that Asheim's concept of regional development coalition cannot be reduced to a model which can be formalised, transferred and transplanted anywhere at will. There simply is too much flesh and blood in it; it is embedded in humans living in the region, interacting together, acting on the loyalties they develop.

Mats Brandt's paper gives an overview of cluster policies in the Nordic countries. The article places "cluster policies" in the somewhat broader context of innovation and industrial policies in the Nordic countries, where Porter to many observers may seem to be old wine in new bottles. There is a quite long and sometimes fairly successful policy tradition of promoting clusters in the Nordic countries, although the creature used to have other names, before Porter came along. This should not come as much of a surprise. In the Nordic context, the question of learning in the economy was never completely left to universities and big industry. Instead, learning was a focus of several important policy areas, like labour relations, industrial policies, educational policies and regional policy.

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<sup>10</sup> Asheim, B.T. (1998) "Learning regions as development coalitions: Partnership as governance in European Welfare States?" Paper presented at the Second Urban and Regional Studies Conference, University of Durham, UK, 17-20 Sept. 1998.

<sup>11</sup> Asheim, B.T. (1999) "TESA bedrifter på Jæren - fra et territorielt innovasjonsnettverk til funksjonelle konserndannelser?" in Isaksen A. (ed.). Step report R-02, Step-group, Oslo.

In the field of labour relations, the Nordic countries created institutional corporatist arrangements supporting the development of learning and specialisation in industry, through agreements rewarding development of formalised skills and wage agreements rewarding staff with formal education. Thus, the labour markets of the Nordic countries became advanced knowledge markets. At the same time, industrial development was seen to include educational and research institutions, like universities, as well as regional policy considerations, where the geographical peculiarities of the Nordic countries, with large sparsely populated areas and isolated industrial towns made co-ordination of industrial and university policy within the framework of regional “growth pole” inspired policies an obvious solution. In countries like Sweden and Finland, a number of celebrated success stories have emerged at the interface of these policies, promoting co-ordinated development of industrial clusters in geographically isolated towns, where the university is an important component of the knowledge infrastructure. In Denmark, regionally embedded craft knowledge is a recognized source of innovation, entrepreneurship and economic development.

Recently, the interest in cluster policies in Nordic countries has boosted. This has both institutional implications, through the establishment of the new, national institution VINNOVA in Sweden, and through the attempts of Norwegian institutions, like SND, to turn around from subsidising credit to start thinking about innovation systems. Interestingly, there is also a revived interest for Nordic economic integration – and Nordic institutions are increasingly promoting innovation policy development<sup>12</sup>.

These institutional innovations also increase the demand for analysis, and new policy solutions. Here, results so far are not impressive. Some of the new publications reinvent simplistic, well-known prescriptions, like the recent “Kluster.se”<sup>13</sup>, arguing for a handful of local cluster agglomerations as the solution to the Swedish innovation policy problem. Another line of papers and books are emerging from yet another round of “national Porter – studies”,<sup>14</sup> mostly concluding with the same simplistic standard prescription as last time: identify winning clusters, and support them.

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<sup>12</sup> Nordisk Ministerråd (2000) *Konkurrenskraft i Norden – muligheter og barrierer for erhvervsmessig synergi i Norden*, TemaNord 2000:537, Oxford Research.

<sup>13</sup> Söderström, H.T. (ed.), Braunerhjelm, P., Friberg, R., Norman, V. and Sölvell, Ö. (2001) *Kluster.se Sverige i den nya ekonomiska geografien*, Ekonomirådets Rapport 2001. SNS Förlag, Stockholm.

<sup>14</sup> Reve, T. and Jacobsen, E.W. (2001) *Et Verdiskapende Norge*. Scandinavian University Press.

## **Lock-Ins and Window Dressers**

There is an alternative to the picture of the intelligent, reflexive and altruist cluster-constructing policy system: Latour's<sup>15</sup> analysis shows the political economy of innovation as dominated by a power struggle, with different interests among groups sharing different types of knowledge and expertise - and different perceptions of reality. In Latour's world, the cluster concept is interesting, not as a means to achieve a common good, but as an empirical artefact in itself, which may be used by different institutionalised actors in games which may lead in different directions. In these games, the stimulus is not the common good, economic development in general, but rather the more narrow interests of the actors and institutions involved. They are involved in mobilisation for various projects whose outcomes can be as unexpected for the actors as the 1968 university turmoil was for the Cold War warriors of the USA. In analysing cluster policies, we should remind ourselves of the possibilities of such unintended outcomes. Just for the sake of argument, let us assume that Schultz had been invited by Krushchev to the Soviet Union to see for himself how the Soviets were able to launch the Sputnik. Let us assume he found that the explanation was not, as he had thought, the level of education in the Russian workforce in general, but on the contrary the organisation of the Russian spatial, –military-industrial and R&D complex, which was regionally concentrated in certain secret, highly privileged, industrial towns. Would he have gone home to write a report on regional industrial clusters, risking the booming budgets his institution was enjoying? The human capital theory - right or wrong - fitted very well with the interests of the institutions where it was invented and promoted, the American universities. This may be purely coincidental, but it most certainly raises the question of whether institutional interests can always be assumed to be consistent with the common good. In promoting reflexive cluster policies, we need a perspective which admits possibilities of fallacies and unintended outcomes.

*Claire Nauwelaers* points out two findings: The cluster concept seems to be broadly diffused in the field of European innovation and regional policy. So is the understanding of innovation and industrial development policies as related to the promotion of “orgware” and “software” At the same time, the actual achievements of cluster policies are not equally impressive. This is due, to a large extent, to “window dressing”, old measures are dressed up in new clothes. This is, again, possible to explain as a result of institutional lock-in.

She points out the danger that so-called cluster policies will just reshuffle existing approaches and instruments, without bringing in the alleged benefits in

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<sup>15</sup> Latour, B. (1993) *We have never been modern*. Cambridge Mass., Harvard Univ. Press.

terms of better addressing the “orgware” and “software” “ of innovation and the sustaining social capital. Thus, Nauwelaers drew rather critical and somewhat paradoxical conclusions after a substantial innovation research effort in 4<sup>th</sup> Framework Programme, and equally substantive cluster policy” efforts in the Structural Funds, results so far are not very impressive.

### **Cluster Policies**

Above, we have pointed out a number of possible varieties of the new learning economy. The hierarchical knowledge governance systems of Fordism are being replaced, not by one clear-cut alternative, but by several different mixtures of market, reciprocity, sometimes even hierarchy. Clusters have advanced knowledge infrastructures, complex industrial networks, social capital and formalised co-operative associations. They may support and embed project economies, where interactive learning is organised in projects based on markets. But there are other options, such as locally embedded reciprocity, sharing knowledge without any intervening market, as well as corporatist systems, where human capital is rewarded by institutionalised regulations. Surely, given this broad diversity, the dynamics of integrating knowledge in the economy cannot be reduced to one single, specific formula that can be implemented by one single, straightforward set of standardised procedures?

This discussion opens a broad research horizon: because interactive learning depends on different forms of closeness and different forms of developing together the exploration of different forms of clusters and clustering is a vital key to understanding not only the logic of the new type of growth, but also how to initiate and promote it. By disconnecting the discussion from the national policy level and reconnecting it into more specific, regional levels, the game of policy implementation is given completely new direction as compared to the standard, macro-level policy formula of the human capital theorists of the early 1960s or, for that matter, the relatively straightforward economically nationalist policy recommendations of Porter and others.

We need a learning *policy process*, where institutions supporting clusters recognize and monitor their genesis, birth and development. As pointed out by Nauwelaers, this topic may be seen as a question of developing *regional policy institutions* with a better capacity to escape lock-in and institutionalised thinking, which, again, may be seen as pending upon our understanding and knowledge of the dynamics of the new learning economy.