Industrial Clusters and Competence Building in the era of the Globalizing Learning Economy

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by
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Your Excellency Deputy Prime Minister, Your Excellency Minister of Science and Technology, Permanent Secretary, President of NSTDA, Ladies and Gentleman,

I am most honored to be invited to this prestigious event. It also gives me a possibility to make a first acquaintance with a country with a rich culture and an exciting history. I also foresee that this first acquaintance in the future will develop into a durable co-operation with colleagues working on innovation and economic development here in Thailand.

The title of my speech is long and complex. It reads:

Industrial Clusters and Competence Building in the era of the Globalizing Learning Economy

What I am going to talk about are also complex phenomena that I have worked upon for more than 25 years. Both as university professor and as director at the OECD-secretariat in Paris.

In a speech like this it is tempting to smooth out what is contradictory and difficult in order to serve a simple and clear message. I will not do that. In my talk I will not hide the complexities but I will try to bring them out in such a form that they stand out clear and loud for you to see.

I will try to illuminate the following questions:

What is an industrial cluster?
Why do industrial clusters emerge?
In what sense and how do industrial clusters promote economic growth?
Can industrial clusters be promoted by public policy?

At the end of my lecture I will come with some advice to government, industrialists and other interested parties regarding policy. Since it is my first time in Thailand this advice will be of a rather general nature – it will be more about how to organize policy than it will be about what specific choices to make in terms of sectors and technologies.

What is an industrial cluster?

I will not bore you with the many alternative definitions that have appeared in the literature. After reading the literature I would define a cluster as *several formally independent firms and organizations located together that do similar things or contribute to the production of similar products*.

In the first part of my lecture I will understand 'located together' – as located in a region but at the end I will see it broader – as located within the same national system of innovation.

There are certainly many examples of clusters in this sense both in services and manufacturing. The examples that have made the greatest impression are perhaps the ICT-clusters in Silicon Valley and its counterpart in Boston area, called Route 128. But the phenomenon is equally important in services. That can be illustrated by Fleet Street in London - the home address of most of the major newspapers in England, Wall Street for financial brokers and Hollywood for the film industry. In Denmark we have regional concentrations both in less advanced areas such as clothing and furniture and in biotechnology. So there is no question that clusters – understood as regional concentrations of firms doing similar things - do exist.

At this stage I would like you to observe that the existence of clusters raises to questions. The first one is the one most often asked:

Why do firms doing similar things locate close to each other?

But another question should also be considered:

Why do the firms that do similar things not integrate into one big firm?

If the answer to the first question is that proximity and scale advantages are key elements for the firms involved we need to ask the second question. The closest interaction and the strongest scale effects we would get within one single firm operating at one single place. Let me tell you in advance that the answer to this second question has to do with the fact that diversity and scope are as important for the performance of firms and clusters as are similarity and scale.

Why do industrial clusters emerge?

There are many heavy books and hundreds of scientific papers written on why firms doing similar things tend to be located in the same region. Even so I believe that it can be brought together in two simple formulas.

Clusters reflect that:

- *competence is built over time through interactive learning demanding proximity and there are increasing returns in the production and use of knowledge*

- *competence is localized – some of the knowledge is tacit and cannot easily be disentangled from the cluster - it is embodied in people, organizations and networks*

Therefore the key to understand the emergence, growth and decline of cluster is a better understanding of learning and knowledge creation in the economy. There is no other way to understand what is going on – and this is equally relevant for what we label low as well as high technology areas.

Clusters develop because regional proximity among firms promotes learning and competence building. They will attract similar and related firms because they want to exploit the common knowledge base and take part in the interactive learning that takes place. Where the cluster starts to be built might be a question of a small event combined with structural factors.

Let me illustrate this with the Silicon Valley story. It can be argued that it was illness that created this cluster. When William Shockley who was Bell laboratories' star scientist in semi-conductors got pneumonia he moved from the East Coast to his aunt in California to recover. When he got well he called for half a dozen of his best collaborators and they joined him in his first Silicon firm. He was not so easy to work with and soon they left him and created their own firms in the region. The small event of Shockley's pneumonia triggered a development that was not to be stopped and that ended in the most famous cluster in the world.

Let me tell you a different story that illustrates the attraction of a national cluster. Some 20 years ago I studied the diffusion and use of dairy technology in Denmark. I found that Alfa Laval, the leading Swedish producer of dairy equipment, had a Danish business unit that was going with a loss year after year. When asked about why they did not close down the unit the top management of Alfa Laval explained to me that they were willing to pay a price for being very close to the most advanced users of technology in the world. They could learn directly from the experience of Danish Dairy factories only by being able to be located close to them.

This leaves us still with the second question.

Why do the firms that do similar things not integrate into one big firm?

To begin with it should be pointed out that integration does take place. The great industrial economist George B. Richardson has actually argued that the most important way for firms to grow is to bring in activities that are similar and that require similar competences. They are less inclined to integrate activities that are complementary but not similar. Richardson helps us to explain why it might not be a good idea to merge vertically with supplier and user firms that produce on the basis of different competences.

But we can also see – from the cluster phenomenon - that there are limits to how far integration of similar activities takes place even when these are located at one place. Therefore we should look for costs and advantages for firms of integrating similar activities. Among the costs are of course that size might become too big and firms too complex to manage. I think that the benefits from taking part in direct and indirect interactive learning are as important when it comes to explain the limits of horizontal integration. Bringing everything into one organization means that there will be too little diversity and that new impulses are reduced. In the longer run such one-company regions might get stuck in reproducing old patterns. At the same time the fact that competitors are just outside your door makes the diffusion of new ideas more urgent and more easy. This gives a general explanation of why we do not end up with gigantic firms but, of course, the size distributions will differ between sectors.

In what sense and how do industrial clusters promote economic growth?

In the following I will refer to what I call the 'globalizing learning economy'. It refers to a world characterized by accelerating technical change and growing international interdependence. To compete in such a world it is important to have access to knowledge but it is even more important to be able to learn as old competences become obsolete.

Therefore as far as industrial clusters promote learning they also promote competitiveness and growth regionally and nationally. Here it is important to make a distinction between learning as moving along a given trajectory and capability to cope with the emergence of a new trajectory.

Let me take an example to illustrate this distinction. Assume that we have a region where firms are specialized in the production of textiles using cotton. Here workers, management, equipment suppliers, technological institutes and marketing firms may engage in interactive learning making the production more and more efficient and developing small product innovations making the products more attractive.

But assume that the introduction of products based upon artificial fibers enter the market and seriously threaten the cluster. In such a situation an inward looking cluster with common narrow perspectives on what can be done might become a negative factor for economic growth. If all actors move even stronger in the old directions – for instance just trying to step up work intensity and productivity - the crises might end with serious problems for the regional and national economy.

This is to say that proximity breeding common understanding is both a positive and a negative thing. On the positive side it makes it possible to move ahead with great speed along a given trajectory. On the negative side the very success might create resistance to radical change. Also for policy makers it is much easier to support movements along a trajectory than it is to stimulate radical shifts in the direction of economic development.

This implies – and I will come back to this in the discussion of industrial policy – that we need to think about how clusters can remain open to what is going on outside the cluster and how to stimulate radical change when this proves to be necessary. This kind of problem is certainly well-known to industrialists responsible for developing the strategy of the firm but it gets more complicated when there is a need to change development trajectory for a whole industrial cluster.

To conclude on clusters and economic growth: Clusters are necessary elements in modern economic growth but they do not always promote growth. They have periods of emergence, growth, decline and renewal and the challenge for all actors are certainly different at each of these stages.

Can industrial clusters be promoted by public policy?

The role of policy in fostering clusters is perhaps the most difficult one. There are certainly many factors that contribute to the emergence and growth of industrial clusters and some of these can be created by public authorities at the regional and national level. But it is also a fact that the most important and dynamic clusters I know of were not planned and they took off without any direct government initiative.

Therefore I would argue that public policy has three potential roles in relation to clusters and I will mention them in an order reflecting how easy it is to design a policy:

- supporting existing clusters
- renewal of existing clusters
- creating general framework conditions that support the emergence of new clusters
- taking specific action to initiate new clusters

Supporting existing clusters

There are many types of initiatives to be considered when it comes to support established clusters. I believe that the most important refers to competence building in an interaction between the private and the public sector. Introducing practical problem oriented training in schools and at universities where students of management and technology get involved in the problem solving of private firms during their studies is important.

Common initiatives between the public and the private sector aiming at upgrading the skill of all categories of employees should be considered. Supporting firms in hiring skilled workers and workers with expert knowledge from the outside (from different regions, firms, countries) might be useful. Traditional firms will always be reluctant to hire academics also when that could constitute an advantage.

Attracting foreign firms with specific competence that is lacking in the cluster or which is at an excellent level might be a good idea – especially if these firms take on a role in building new competence in the local labor force. To initiate a regional technological infrastructure that supports the technical base of the cluster may be a task for public sector. Sometimes some of the most important barriers for the growth of local firms will be those hindering them from entering international markets – here the public sector may help to organize firms in common efforts to do so.

Supporting the existing cluster is the least demanding of the four forms of policy mentioned above. It needs to be reviewed critically from time to time. Often support policies will take place even in situations when no-one in a region have heard about clusters or cluster policy. Local interests will be established around any existing cluster and they will ask for different kinds of support from local and national government.

Sometimes the relationships might actually become too close and the co-operation might even lead to corruption of public servants. This is a serious threat because interactive learning is highly dependent on equal and fair treatment. Corruption undermines trust and without mutual trust interactive learning will not take place. In general, learning is highly dependent on mutual trust.

Renewal of existing clusters

This is where government has an important and somewhat more difficult role to play. It might involve elements of conflict with the existing interest groups and with local lobbies and it is also demanding in terms of the competence of public servants.

The basic rule is that public servants cannot know better than industrialists what the future will bring in terms of technologies and markets and that 'picking the winner'-strategies have to be ruled out. But the public servants may be helpful in stimulating the renewal of existing clusters in more indirect ways

What public servants can do is to help the business community to organize a surveillance of industrial clusters that makes it possible to find out when they seem to get into trouble and help stimulate crisis management when it happens. If it is more ambitious it might also organize a surveillance of markets and technologies aiming at locating opportunities and threats to the cluster. In my own region firms belonging to the cluster of mobile communication development firms have established their own local cooperation - NorCom – and some of my colleagues from the university assist them in that kind of analysis. You can take a look at this case of collaboration through the web-site www. norcom.dk

Creating general framework conditions that support the emergence of new clusters

I will be brief on general framework conditions since I assume that this is a field where you all know the debate. Let me just mention some dilemmas in this field.

The first dilemma has to do with the *infant industry argument* for protection of new industries/clusters that are exposed to competition from more developed countries. WTO tends to give strong restrictions on what may be done legally in this respect but it is a fact that historically all developed countries – including the US - have pursued such policies with some success.

The real problem is to avoid that such policies result in 'feather-bedding' where national champions get a too cozy life. Competition is a very important factor driving innovation in firms – without it inefficiency and bad habits will thrive and little efforts will be made to innovate. Therefore there is a need to combine protection with competition. In Japan the MITI and other agencies, as a kind of response to the dilemma, tried to promote what they called 'controlled competition' – while supporting national firms in developing and using new technologies they stimulated tough competition among the firms at home as well as abroad.

The second dilemma has to do with the integration of knowledge institutions in the economic process. There is no doubt that universities have come much closer to the market place in certain respects the last decade. This is most clearly the case in sciences related to biotechnology and pharmaceuticals. Star scientists at universities have become attractive assets for firms and universities increasingly engage in patenting in these fields and hereby they get access to more funding when governments do not want to pay for research in the public domain.

It is tempting in this situation to develop a policy where the only objective is to get knowledge production closer to the market. But it should be realized that such a policy may have long term negative effects. One of the important roles for scientific activities is to produce unexpected results. Getting a too strong focus on the immediate usefulness of research undermines this function.

Another function even more important is that in a knowledge society the reliability of knowledge becomes as crucial as is the reliability of money in a monetary economy. If universities become completely market driven we might not have any institution outside the market to judge what is reliable knowledge – I think that this has a parallel to the fact that it is generally recognized that central banks should have a certain autonomy both in relation to markets and policy makers.

This is why it is important to establish separate bridging institutions such as Science Parks. They help to link science to users of science without leaving the whole burden neither to the academic community nor to business. They may be seen both as a vbridge and as a buffer zone protection science from getting completely absorbed by the market. They may also be important in bringing new and old scientific discoveries into a form where they can be absorbed by business.

Taking specific action to initiate new clusters

This is normally regarded as being outside what policy makers can do. Even so it might be the case that Japanese industrial policy in the fifties supported the building of an automobile industry almost from scratch.

What could be done is the following – and now I leave the level of regional clusters and focus on national system of innovation as a whole.

1. Analyse the national system of innovation in terms of its specialization, institutions, human resources and technological infrastructure.

2. Put the single firm – manufacturing or service – into focus and include traditional as well as technologically advanced firms in the analysis. Analyse how firms organize innovation and learning in order to find and diffuse good practice.

3. Put the single firm into focus and see how its competence building is linked to other firms, to the labor market, to knowledge institutions and to the technological infrastructure. Look for obsolete linkages, mismatches and missing links.

4. Define the strength and weakness and the major challenges, in terms of threats and opportunities, for the different parts of the economy. Look for unexploited potentials in terms of competence or new combinations of specialized competence.

The framework for such an analytical exercise could be the following:

Establishing a Council for the promotion of the Thai Innovation and competence building system (CTI) to organize and follow the exercise. Involve a combination of domestic industrialists, trade unionists and policy makers together with some international counterparts.

Scholars who have an expertise in innovation studies could design and execute the project in collaboration with scientific expertise from other parts of the world – coming for instance from countries in Asia and Latin America. The project could be pursued in an interactive mode between the scholars and the Council aiming at transforming research results into a knowledge base for policy making. Normally a high degree of autonomy should be left to scholars as long as the plans are fulfilled. To demonstrate that it can be done, I will, at the end of my lecture present Your Excellency, Deputy Prime Minister with a dedicated copy of my book on the Danish innovation system. It brings together the analytical outcome of such an exercise in Denmark.

The outcome of such an exercise could actually include proposals and ideas for new clusters – for instance by promoting new combinations of competence already existing in certain regions or at the national level. But, it is important to realize that not all important interactions take place at the regional level. Actually, mapping empirically the networking among firms engaged in innovation processes shows that what matters more than regions to the pattern of interaction are national borders. Therefore I will at the very end of my lecture say a few words about why national systems of innovation matter.

Conclusion: Not everything is regional – we need to understand the role of clusters in the light of the national system of innovation

The analytical foundation of what I have said so far is the hypothesis that learning has become a prerequisite for high economic performance and competitiveness for firms and regions. The same is true for national systems.

It is important to build a national technological infrastructure that supports competence building in all kinds of firms - not only those located in regional clusters. Having a national education and training system that promotes ‘learning to learn’ among pupils and trainees is important.

Having a social and legal system that creates trust and interaction among people is a most important national asset. Creating a national culture where the search for more understanding and for utilizing knowledge for practical purposes is a key to economic

development. National labor market institutions need to be assessed also in relation to how far they support life long learning.

Having good elements in the system is not enough. Focus needs to be on the interaction between the elements. At the national level the shared culture and language makes it easier to communicate and interact and that should be exploited to build linkages at the national level. But technologies and markets evolve at the global level and therefore the openness to new ideas is important for economic development. Linking up with dynamic partners abroad may be the best way to bring new ideas into the national innovation system.

So while regional clusters are important for economic growth - *they need to be analyzed in the broader context of the national system of innovation*. By widening the perspective we also avoid some risks immanent in the cluster perspective. It is always easier to observe what is already there in terms of clusters and it is also always easier to design policies that move us further along roads already known to us. But in the long run such a strategy might not be sufficient. Getting closer and closer integrated in a kind of regional village economy may not be enough – from time to time it is useful to take the helicopter and look at the landscape as a whole. Doing so, we will hopefully find new directions and ideas for innovation and competence building.

Suggested Readings:

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