

**D**ANISH **R**ESearch **U**NIT FOR **I**NDUSTRIAL **D**YNAMICS

DRUID WORKING PAPER NO. 96-1

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April 1996

ISSN 1396-2035

# **The Social Dimension of The Learning Economy**

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## **Abstract**

This paper is a slightly revised version of Bengt-Åke Lundvall's Inaugural Lecture, the 10th of November at Department for Business Studies, Aalborg University. The general message is that the growing frequency of so-called paradoxes in economic theory and of unsolved socio-economic problems reflects that neither economic theory nor policy has been adapted to the fact that we have entered a new phase: the 'Learning Economy'.

It is shown that in the learning economy the capacity to learn increasingly determines the relative position of individuals, firms and national systems. The growing polarisation in the OECD-labour markets is explained by the increasing importance of learning and the acceleration in the rate of change. Finally, it is argued that the learning economy will not be sustainable if these tendencies are not countered by a New New Deal which puts the focus on the distribution of capabilities to learn.

## **Keywords**

*Learning, knowledge, economic development*

## **JEL Classification**

*D83, O12, O31, D23.*

ISBN 87-7873-000-7

## 1. Introduction

The general message of this presentation is that standard economic theory and policy have become increasingly inadequate because of the fact that we have entered a new phase of economic development which I will refer to as *the learning economy*.<sup>12</sup> It is reflected in a crisis of economic theory where more and more observed empirical patterns appear under the label of paradoxes - what they show goes against what standard economic theory predicts.<sup>3</sup> It is also reflected in a crisis for economic policy where increasingly those responsible are giving up their ambitions to solve the most serious socio-economic problems - be it underdevelopment in the South, unemployment in the North or the global problem of pollution.

In order to illustrate why the learning economy is a useful perspective I will address two related issues: the polarisation in the labour market and the role of trust in economic analysis and economic development. I will show that there is a need for a New New Deal focusing on a redistribution of the capacity to learn and communicate. I will argue that without such a New New Deal trust - which is a fundamental social precondition for the dynamic efficiency of the learning economy - will erode.

Before doing so it is necessary to introduce the conceptual and analytical framework and address a crucial and much debated issue in relation to the learning economy: What is the impact of

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<sup>1</sup> One major points in this paper is that learning is an interactive process and that knowledge is a collective asset shared in networks and organisations. This is true also for the ideas to be presented here. Several colleagues from the IKE-group have played a major role in working out these ideas. It is certainly true for Esben Sloth Andersen, Bjoern Johnson and Bent Dalum but many others should be mentioned. For instance, Gert Willumsen made pioneer work on the interactive learning going on between users and producers which is one important building block in the argument.

<sup>2</sup> For earlier contributions to the analysis of the learning economy see Lundvall&Johnson (1994), Lundvall (1996) and Foray&Lundvall (1996).

<sup>3</sup> Among the better known paradoxes, where the fact that the theoretical model neglects the role of learning gives rise to a contradiction between model and reality, are the Leontiev-paradox, the Kaldor-paradox and the Solow-paradox. It is interesting to note that they become generally recognised as paradoxes only when an established economist puts his authority behind the controversial set of data.

information technology on the relative importance of tacit versus codified knowledge? Here I will argue that the relationship between codified and tacit knowledge is symbiotic and that the idea that there is a one-way movement from one to the other may be too simplistic. This conclusion is important because it implies that tacit knowledge and the learning of skills will be fundamental for the economic success of agents also in the future.

## 2. Defining the Learning Economy

The concept 'the Learning Economy' can be used in a double sense. First, it evokes a specific theoretical perspective on the economy where the emphasis is on explaining and understanding the process of change in technology, skills, preferences and institutions. Second, it may refer to specific historical trends which make knowledge and learning increasingly important at all levels of the economy. I will make use of both of these perspectives and argue that our economies have entered a historical period where the role of knowledge and learning is important and that a new theoretical perspective is called for. It is no longer legitimate to operate with a theoretical core where technology, skills, preferences and institutions are treated as exogenous - at least not if we are interested in explaining economic development.

The learning economy indicates an economy where the success of individuals, firms, regions and national economies reflect their capability to learn (and to *forget* which is often a pre-requisite especially for learning new skills). The learning economy is an economy where change is rapid and where the rate at which old skills get obsolete and new ones become in demand is high. <sup>4</sup>

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<sup>4</sup> My perspective is akin to Pasinetti's, especially as it is reflected in his famous introduction to his book on economic growth and structural change (Pasinetti, 1981). He emphasises the fact that the efficient allocation of scarce (given) resources is of secondary importance in an industrial economy and that the standard neoclassical framework should be regarded as especially suited for analysing a pre-industrial phase of commercial capitalism based on trade with natural resources. Pasinetti recognises that learning - in production and in connection with consumption - is the most important process. But the process of learning remains exogenous and unexplained in his model. The learning economy-perspective presented here may be regarded as complementary to his approach. First, in contrast to the Pasinetti-model, some emphasis is put on specifying the institutional set-up. Second, the historical perspective goes one step further than Pasinetti's analysis which

Let me also say a few words about what the learning economy is not. The learning economy is affected by the increasing use of information technology but it is not synonymous with what is often called 'the information society'. It is fundamental for what I am going to say that knowledge is something more than information. Information corresponds to the specific elements of knowledge which can be broken down into bits and sent long distance by means of information infrastructures. Therefore neither is learning just access to an increasing amount of information. Knowledge includes skills and fundamentally learning is a process of building competencies.

Neither is the learning economy necessarily referring to a Hi tech-society. One aspect of the learning economy is that knowledge intensive activities grow more rapidly than other activities. But the learning economy does not signal a science-based economy dominated by hi-tech firms and by those who have an academic training. Learning is an activity going on in all parts of society and it is an opportunity open for all citizens regardless if they are scientist or if they are workers engaged in simple tasks. For instance it is important to note that the capability to learn in traditional raw material based economic sectors has been crucial for the relative wealth of the Nordic countries. To establish processes of learning in traditional sectors as well as establishing new knowledge-based activities is today the major challenge for developing countries as shows the examples of Korea and Taiwan.

### **3. Stylized Facts**

Several indicators point to the growing importance of knowledge in the economy.

1. Analytical work on long term economic growth by Abramowitz and others shows that in the 20th century the factor of production growing most rapidly has been human capital. And there are no signs that the growing proportion of human capital has reduced the private and the social rate of return on investment in education and training. On this basis economists and economic historians have

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emphasised the industrial economy and the role of learning in the context of manufacturing. New concepts such as the post-industrial society, the service economy and the information society all point to a stronger emphasis on intangibles and services as output and on labour in the form of information processing as input and to the fact that handling tangibles is becoming a rather marginal activity. Learning becomes even more important in this new era.

argued that technical progress has favoured the productivity of skilled rather than unskilled labour (Abramowitz, 1989, p. 27f.).

2. Recent analyses by the Canadian Government show that in the eighties almost all net job creation took place in the knowledge-intensive sectors of the economy. Using two different definitions (R&D-intensity and proportion of the staff with a university degree) it was found that this tendency was significant across regions, across firm size and in services as well as in manufacturing (Industry Canada, 1993 and 1994).

3. One of the most striking results coming out of OECD's Jobs Study is the strong tendency in the 80s toward a polarisation in labour markets. In all major OECD-economies the relative employment situation has worsened for the less skilled in spite of the fact that they form a smaller and smaller proportion of the total labour force (OECD, 1994a). An analysis for the Welfare commission shows that the same tendency is at work also in Denmark. Increasingly it is the segments of the labour force with the weakest skill base which tend to become marginalised in the labour market (Velfaerdsommissionen, 1994).

One common weakness with these data sets is that they mainly reflect knowledge emanating from formal education and training. They do not capture the importance of skills, competencies and capabilities emanating from learning in the context of regular economic activities. Currently, efforts are made in connection with the OECD-follow up of the Job's Study to capture these learning activities by new indicators based on questionnaires addressed to private firms. The new Danish Research Unit for Industrial Dynamics - DRUID - has joined these efforts in connection with the DISKO-project - an analysis of the Danish System of Innovation in a comparative perspective. A Danish survey is under way.

#### **4. Different kinds of knowledge**

In order to understand the role of learning in the economy it is useful to make distinctions between different kinds of knowledge. Knowledge and learning are generic and general concepts which need to be further specified in order to become useful analytical tools. In an earlier paper we (Lundvall&Johnson, 1994) have proposed the following taxonomy<sup>5</sup>:

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<sup>5</sup> At least two of these categories have roots back to Aristoteles' three intellectual virtues. Know why is similar to Episteme and know-how to his concept Techne. But the correspondence is not perfect since we will follow Polanyi and argue that scientific activities always involve a

- Know-what
- Know-why
- Know-how
- Know-who

*Know-what* refers to knowledge about "facts". How many people live in New York, what are the ingredients in pancakes and when was the battle of Waterloo are examples of this kind of knowledge. Here, knowledge is close to what is normally called information - it can be broken down into bits.

*Know-why* refers to knowledge about principles and laws of motion in nature, in the human mind and in society. This kind of knowledge has been extremely important for technological development in certain science based areas such as for example chemical and electric/electronic industries. To have access to this kind of knowledge will often make advances in technology more rapid and reduce the frequency of errors in procedures of trial and error.

*Know-how* refers to skills - i.e. the capability to do something. It might relate to the skills of production workers. But it is important to realise that it plays a key role in many other activities in the economic sphere, as well. The businessmen judging the market prospects for a new product or the personnel manager selecting and training the staff have to use their know-how. And the separation between know-why as science-related and know-how as being mainly practical may also be seriously misleading. One of the most interesting and profound analyses of the role and formation of know-how (or personal knowledge) is actually about the need for skill formation among scientists (Polanyi, 1958/1978).

Know-how is typically a kind of knowledge developed and kept within the borders of the individual firm or the single research team. But as the complexity of the knowledge-base is increasing co-operation between organisations tends to be further developed. One important rationale for the formation of industrial net-works is the need for firms to be able to share and combine elements of know-how. Similar networks may be formed between different research teams and laboratories.

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combination of know-how and know-why. His third category *Phronesis* which relates to the ethical dimension will be reflected in what I am going to say about the need for a social dimension in economic analysis and about the importance of trust in the context of learning. Flyvbjerg (1991) includes an interesting discussion of the relevance of Aristoteles for modern social science.

This is also the reason why *know-who* becomes increasingly important. Know-who involves information about who knows what and who knows to do what. But especially it involves the social capability to establish relationships to specialised groups in order to draw upon their expertise.

## **5. Learning different kinds of knowledge**

Learning to master and absorb the different kinds of knowledge takes place through different channels. While know-what and know-why can be obtained through reading books, attending lectures and accessing data bases, the other two categories are primarily rooted in practical experience and in social interacting. Know-what and know-why can more easily be codified and transferred as information. Some of it may even be sold in the market if the proper institutional instruments are developed. This is why main-stream economic analysis tends to focus on processes of learning involving the transfer of know-what and know-why while neglecting know-how and know-who.

Know-how will typically be learnt in something similar to apprenticeship-relationships where the apprentice follows his master and relies upon him as his trustworthy authority (Polanyi, 1958/1978, p.53 et passim). The importance of know-how in natural sciences is reflected in the fact that the training involves field work or work in laboratories to make it possible for students to learn some of the necessary skills. In management-science, the strong emphasis on case-oriented training reflects an attempt to simulate learning based on practical experience. Know-how is basically tacit knowledge which cannot be easily transmitted. It will typically develop into its highest forms only after years of experience in everyday practice - through learning-by-doing and through interacting with other experts active in the same field.

Know-who is learnt in social practise and some of it is 'learnt' in specialised education environments. Communities of engineers and experts are kept together by re-unions of alumnaes and by professional societies giving participants access to bartering information with professional colleagues (Carter, 1989). It also develops in day-to-day dealings with customers, sub-contractors and independent institutes. One important reason why big firms engage in basic research is that it gives them access to informal networks of scientists (Pavitt, 1992). Know-who is socially embedded knowledge which cannot easily be transferred through formal channels of information. Neither can it be sold in the market without losing some of its intrinsic functions.



## 6. The analytical framework

The analytical framework presented here can be contrasted to mainstream economic theory. It is well-known that the theoretical core of standard economic theory is about making choices between well-defined alternatives and the allocation of scarce resources. What is proposed here is a double shift in focus which can be illustrated by the following table.

Table 1 illustrates that learning and innovation can be analysed in analytical frameworks close to the mainstream neoclassical economics. For instance, attempts have been made to apply rational choice to the analysis of innovation, corresponding to a neoclassical approach to innovation management. Second, learning has been directly linked to the allocation problem and to the market process. While the Schumpeterian entrepreneurs are destabilizers who create havoc in the general equilibrium, the main function of Kirzner-entrepreneurs is to re-establish equilibrium through a learning process. The Kirzner-entrepreneurs promote learning as they fill the void of ignorance which reigns between producers and consumers (Kirzner, 1979).

As illustrated in table 1 The Learning Economy-perspective differs from the standard analytical framework in two important respects. First, what is treated as a given framework for rational choice - technologies, preferences and institutions - are assumed to be in a process of flux - they are learnt and forgotten as time goes by. It is also taken into account that agents can become more or less skilful in making choices through the process of learning.

Second, the focus is not so much on allocating existing resources as on the creation of new use-values, products and services. In a system of accelerating change it would be 'irrational' for individuals, firms and national systems to use all their limited intellectual capabilities to reshuffle what they already have got instead of creating new ideas and new things. Those who did focus exclusively on allocation would not survive in the long run.

Table 1: Four different perspectives in economic analysis

	Allocation	Innovation
Making choices	Standard neoclassical	Innovation management
Learning	Learning to allocate - Kirzner and Hayek	The Learning Economy

Thus it is clear that the learning economy cannot easily be captured by the neoclassical analytical framework and there are good reasons to look for an alternative. Evolutionary economics increasingly presents itself as such an alternative. The emphasis it gives to qualitative change and its use of concepts such as variety, selection and reproduction makes it much more relevant when it comes to analyse innovation and learning. What is less attractive with the evolutionary framework is that it tends to leave little room for human action and creativity. Specifically there is a need for integrating human design of institutions and structures into the models. The point is that the models should reflect that people are not ants blindly playing by given rules. From time to time people unite in order to change the rules of the game and many of the rules are under permanent debate.

## **7. The codification trend**

Foray and Paul David have put forward some interesting ideas about the codification of knowledge as a major new trend. First, they assume that there is no kind of knowledge which is tacit *by nature* - if incentives are strong enough, any kind of knowledge can be codified. Second, they argue that the broad diffusion of information technology accelerates a long-term tendency towards increasing codification. There are two different mechanisms at play. First, the very existence of information infrastructures makes it more attractive to put knowledge in a form which can be transmitted by such infrastructures. Second, different techniques connected to information technology affect the production of new knowledge and gives more of it a codified form. For instance it is now becoming possible to make more and more of the testing and the design of new products through virtual experiments using computer simulations (Dasgupta and David, 1994 and David and Foray, 1995).

By using the knowledge taxonomy developed above, we can see both the rationale and the limits of this argument. There is little doubt that the incentive to codify 'know-what' and put this kind of knowledge in the form of data bases and encyclopedian products of the cd-rom-type. The same is true for the 'know-why' category where scientists all over the world for the first time in history can communicate and co-operate across the globe in real time if they can put their message in a codified form. There are growing efforts also to transfer 'know-how' into codified forms - computer-based expert systems simulating the operation of the mind of the skilled specialist are becoming more and more frequent. Finally, in the

know-who category, data-bases which register the names of specialists can be bought in the market.

But while the codification can go very far in the field of 'know-what' there are important limitations for codification in the other fields of knowledge. *Know-why* can be fully codified only in areas where little new knowledge is currently produced or the new knowledge is purely incremental. When scientific principles are in a state of flux or when they are disputed within the scientific community they cannot easily be communicated outside a narrow group of collaborating scientists. The work on experts systems has demonstrated that the transfer of *know-how* from a tacit into an codified expert system-form is far from innocent. There are skills of an intuitive kind which remain hidden and tacit and which cannot be incorporated when the codification takes place (Hatchuel and Weil, 1994). Finally, it is obvious that a register of names cannot integrate the social network relationships which are included in the *know-who* category.

Actually, some of the tendencies emphasised by the protagonists of the codification trend have contradictory effects on the relative importance of tacit knowledge and on learning-by-doing and learning-by-interacting. First, the steep increase in the amount of data to which there is public access implies that specific skills become of even greater importance than before. The demand for capabilities to recognise new patterns in the data, to select relevant and disregard irrelevant data and to learn new and forgetting old skills become more in demand than before. These skills have a tacit element and they differ between specific fields of practical activity. This is why experts do not lose their relative position in the learning economy and why know-who remains an important element of economic knowledge.

Further, the formalisation of certain stages of the process of innovation reduces the time and effort involved at these stages. This will result in an acceleration in the rate of innovation and it will create bottle-neck problems at other stages. These stages will typically be the ones which are most intense in their use of skills and tacit knowledge. In a period where the rate of change accelerates the need to use know-who relationships increases. So again the relative importance of tacit knowledge might actually increase as a result of the codification trend.

Perhaps it is not at all fruitful to regard tacit versus codified knowledge as two different pools where there is a flow from one to the other. The relationships are much more complex and symbiotic. In a way codified knowledge may be considered as a material to be

transformed and elements of tacit knowledge as tools to handle the material. When the material becomes more complex, changes more rapidly and grows in volume the demand for more and different tools will be growing.

An alternative perspective puts the focus on the spiral movement where first tacit becomes codified knowledge followed by a movement back to practise where new kinds of tacit knowledge are developed. Such a spiral movement is, according to Nonaka (1991), at the very core of individual as well and organisational learning.<sup>6</sup> Finally, it is important to recognise that in the real world the distinction between the two kinds of knowledge is not always clear-cut. At any point of time a certain amount of knowledge is in the pipe-line being in the process of codification. While some engineers and scientists are involved in producing innovations and inventions a much bigger proportion is engaged in standardisation and in codifying and generalising knowledge.

## 8. Networked knowledge

Kenneth Arrow has recently pointed out that the traditional dichotomy between public and private knowledge may be becoming less and less relevant (Arrow, 1994). Hybrid forms of knowledge which are neither completely private nor completely public become increasingly important. More and more strategic know-how and competence is developed interactively and shared within subgroups and networks. Access and membership to such sub-groups is far from free. This change in the character of knowledge may be regarded as the other side of the more generally recognised organisational developments where the dichotomy between market and hierarchy is challenged by hybrid forms which are known as *industrial networks* (Freeman, 1991).

The same may be true for the dichotomy between codified versus tacit knowledge. The increasing emergence of knowledge-based networks of firms, research groups and experts may be regarded as an expression of the growing importance of knowledge which is codified in local rather than universal codes. The growing complexity of the knowledge base and the more rapid rate of change makes it attractive to establish long term and selective relationships in the production and distribution of knowledge. The skills necessary to understand and use these codes will often be

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<sup>6</sup> A similar idea is used to classify different strategies for learning in firms by Boisot (1995).

developed only by those allowed to join the network and to take part in a process of interactive learning.

Perhaps one of the most fundamental characteristics of the present phase of the learning economy is the formation of knowledge based networks some of which are local while others cross national boundaries. The access to such networks may be crucial for the success of firms as well as research teams. The growing importance of information infrastructures implies that the question about inclusion and exclusion becomes increasingly important. The network form of organisation is flexible but it is not necessarily supportive to social cohesion at the national level. A more feudal type of society can be envisaged and in another paper I have pointed to the risk for what I call Intellectual Tribalism (Lundvall, 1995) where each network develops its own internal code of conduct which is not extended to non-participants.

## **9. Technology and employment in the learning economy**

The traditional approach to the issue of technology and employment is to assume that new process technology tends to substitute for labour. In connection with information technology there have been extreme expectations regarding its impact on labour productivity. In real life it is not easy to realise these expectations. Chris Freeman and Carlota Perez have more strongly than anybody else pointed out these difficulties in connection with their analysis of how new techno-economic paradigms are established (Freeman and Perez, 1988). And now we have some unique Danish material illustrating their point (Nyholm, 1994).

Diagram 1 shows that the firms introducing new automation and information technology for the first time experience a substantial slow-down in terms of productivity growth as compared to firms which do not use automation technology. Actually, it shows that it takes four years before the productivity loss has been completely regained. The efforts needed to learn to master the new technology are substantial. Diagram 2 indicates that organisational change is crucial for the learning taking place in connection with the introduction of information and automation technologies. It shows that firms which combine the introduction new technology with new forms of organisation have been able to cut their learning costs dramatically.

## **10. Polarisation and acceleration of change in the learning economy**

The problem is not that information technology takes jobs away in general, it is rather that the introduction of information technology accentuates the shift in demand from less skilled to more skilled workers. This has been documented as a tendency both for the US and for Denmark. The stylized facts I referred to earlier confirm a strong and world-wide trend in this direction. Diagram 3 which shows the relative unemployment and employment situation for less skilled workers shows that the trend toward polarisation is strong in all major OECD-countries with the exception of the US where the shift in demand has resulted in a drastic fall in relative wages instead and Japan where the institutional set-up seems to be the most resistant to polarisation.

Why did this polarisation of the labour market take place and why did the process accelerate in the eighties? At least three different hypotheses have been put forward in this context. Globalisation, biased technological change and changes in firm behaviour are the major factors evoked in the debate.

One general problem with these proposed explanations is that the three hypotheses normally have been tested separately and regarded as alternatives. It is more plausible that they interact in their impact on jobs. In what follows I will propose an interpretation which regards the three elements as factors which work together in promoting an acceleration in the rate of change and learning.

There is little doubt that over a longer time span there has been an acceleration in the rate of learning and change. We have to go just a few generations back to find ancestors who were doing the same things in the same ways as their grandparents and normally they did it in the same locality. Change has accelerated enormously since the beginning of the industrial revolution and people have been forced to engage in learning to do things differently and to operate in new environments.

But what about the rate of change in the medium term? It is not easy to find reliable and valid indicators for the rate of change and learning. The rate of productivity growth is actually lower than in the fifties and the sixties. Indicators of structural change in terms of changes in the sectoral composition of production and employment do not give clear indications in this respect. While changes in the structure of employment seem to slow down in the eighties a slight acceleration seems to have occurred when sectors

are measured in terms of output (OECD, 1994b, p. 15 and 1994c, p. 143).

The movement towards flexible specialisation where producers increasingly compete by responding rapidly to volatile markets may be regarded as a response to a more rapid rate of change. This is true for organisational change in terms of 'just in time' and lean production' strategies. Again rapid change will imply a strong demand for a capability to learn and respond to new needs and market opportunities.<sup>7</sup>

Another way of indicating the growing importance of change and learning has been proposed by Carter (1994). She shows that there is a close connection between the proportion of non-production workers and the rate of change in a sector and actually she argues that the major function of non-production workers is to create or to react to change. On the basis of data on employment patterns in US-manufacturing it is demonstrated that a growing proportion of costs are costs of change rather than costs of production.

## **11. The need for a New New Deal**

This points to an interpretation of polarisation as strongly related to the speed-up of the rate of change imposed by growing international competition and new technological opportunities. These developments do in their turn give an incentive to firms to hire personnel with a high learning capability. The information technology and the codification of new kinds of technology reinforce the acceleration and gives a preference to workers with general competencies in handling codified knowledge. These tendencies increase the proportion of workers promoting change and lead to a further acceleration in the rate of change. The process is thus characterised by cumulative causation and it has as a consequence the exclusion of a big and growing proportion of the labour force from normal wage work. If this hypothesis is correct there is a need to develop a new perspective on policy making and to look for a new kind of social compromises.

One alternative is, paradoxically, to speed up further the rate of learning in the sectors facing international competition in order to obtain a bigger share in the most rapidly growing markets. Another is to create a sheltered sector where learning takes place at a slower rate. A third, and perhaps the most important, is to

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<sup>7</sup> For an interesting collection of case studies illustrating the change in organisations responding to the need for flexible specialisation see Andreassen et al (1995).

redistribute the access to information networks and the capabilities to learn in favour of the potentially excluded.

It becomes increasingly difficult to compensate those who get marginalised ex post through taxes and subsidies. This is why it is necessary to make a major effort to support the learning capability of those who run the greatest risks of getting marginalised. This must involve a radical re-organisation of the ordinary school system, including broad access to the use of information technology as a means of making training more accessible. It also involves a substantial effort in supporting the training of those already in the labour force. Giving firms incentives to become learning organisations which upgrade the skills of all categories of employees is another important element in such a New New Deal.

## **12. Why the learning economy is a mixed economy**

It has been generally recognised that it is difficult to integrate information on line with other assets into neo-classical economic analysis and that the production and distribution of information often will be characterised by market failure. When the perspective is widened to encompass tacit knowledge and the process of learning new skills, these problems become even more obvious.

Trade in information is difficult because there will always be an asymmetry between the seller, who knows the information and the buyer, who is willing to pay for it only because he does not have full access to it. There will be uncertainty involved and quite some room for opportunistic behaviour. This is why trust will play a key role as a prerequisite for successful trading in information.

In more complex situations where different parties are involved in a process of interactive learning, trust will play an even more fundamental role. Much of my earlier work has been on the interaction between users and producers in connection with product innovations (Lundvall, 1988). It is obvious that a minimum of insight in the needs of users is necessary in order for producers to be successful in developing new products. This kind of knowledge is complex, qualitative and often it is semi-codified - i.e. it is expressed in a local code shared by a sub-set of users and producers. If we apply neoclassical analysis - either in its original version or in the form of transaction cost analysis - we would reach the interesting conclusion that product innovations can not take place. The pure market cannot transfer the knowledge and, according to the transaction cost perspective, the alternative would be to suppress the market and integrate vertically.



The fact is that producers use a lot of R&D to develop new products and innovation counts show that important product innovations are at least as frequent as important process innovations. The explanation is that markets are not pure - markets are *organised*. They include channels for exchanging qualitative information as well as social elements of dominance and trust.

The learning economy-concept signals that there is a need to generalise this special case to a broader set of interactions involving learning. While it is *difficult* to exchange information in the pure market it is *impossible* to get access to tacit knowledge through ordinary market transactions. There are different prototypes of learning new skills but they all have in common their strong roots in the social system. The apprenticeship prototype combines elements of authority with elements of trust. Another prototype could be the 'Academy' where some of the discourse may be taking place between equals and where there are strict ethical rules making sure that the communication is truthful and honest.<sup>8</sup>

Learning in general and especially the process of learning know-how and tacit knowledge in an interaction with other people is strongly affected by trust. Trust is a multidimensional concept but it has to do with reliability, honesty, cooperativeness and a sense of duty to others. There will be more or less of it and it may extend more or less widely. The learning economy needs a lot of trust and there might be a premium to people being able to promote trust but as Kenneth Arrow has pointed out trust cannot survive in a pure market context. Actually he says that 'trust cannot be bought: and if it could be bought it would have no value whatsoever' (Arrow, 1971).

The fundamental role of trust and organised markets raises strong doubt about another standard assumption in neoclassical theory. It is assumed that in the economic sphere it is reasonable to approximate human behaviour to the so-called economic man who calculates the outcomes of all alternatives in order to select the one which is best for him. Williamson is consequent when he brings into the analysis the possibility that economic man will act as an opportunist and cheat and lie when it pays off. Instrumental and

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<sup>8</sup> It is interesting to note that some of the countries which have been most successful in promoting learning in production, Japan and Germany, have established a capitalist society in a rather authoritarian culture. The very flexible forms of organisation characterising Japanese firms may have as a prerequisite socially rooted authority relationships.

strategic rationality is assumed to be the norm and the ideal in the economic sphere (Williamson, 1975).

To test this assumption we might consider what would happen in situations of interactive learning where the masters, the apprentices, the colleagues at the university and the co-operating R&D-departments were guided exclusively by this kind of behavioural rules. Organisations, research teams and laboratories where people followed a different kind of rationality - a communicative rationality - characterised by a shared and genuine interest in understanding new phenomena, mastering new techniques and sharing their knowledge with apprentices and colleagues - would be much more successful than the ones where individual utility was the single goal.

There are thus in the learning society forces which work against some of the most crude aspects of capitalist society. But they are struggling with other tendencies emphasising private gain and individualism. The increasing autonomy of a globalised financial sector and the attraction of quick profits to be reaped by speculation is one of the forces undermining the learning economy. But the most important threat may be coming from within the learning economy and be related to the trend toward social polarisation.<sup>9</sup>

### **13. Polarisation and trust**

Strategies promoting the learning economy are to be preferred to other competitiveness strategies because they are not zero-sum games. Trade protectionism, devaluations, wage policies as well as different forms of environmental and social dumping will only give short term relief and normally they will have a depressive impact on the world economy as a whole. As far as the learning economy stimulates the development of new products and services as well as the diffusion of new products and services they will stimulate world-wide economic growth.

But as we have seen such strategies may further accelerate the rate of change and thereby aggravate social polarisation. This is of course an important problem in itself because it makes society less comfortable to live in. More and more resources will be absorbed by activities protecting the privileged from the marginalised and

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<sup>9</sup> In the new book by Fukuyama (1995) the focus is on trust as a kind of 'social capital' which tends to be eroded especially in the US. Some of the historical analysis has been made with a light hand but his basic intuition may still be to the point.

insecurity will grow for everyone. But it is important to realise that such a scenario is not sustainable in the long run also for another reason. It will not be possible to preserve a reasonable degree of trust without a minimum of social cohesion. As the social basis for learning is eroded, the rate of change will slow down. This is one reason why the analysis of the learning economy cannot neglect the social dimension and also why any policy strategy aiming at promoting the learning economy must have a New New Deal as an integrated part.

#### **14. Conclusions and an agenda for research**

In this paper it is proposed that there is a need for a change in the perspective of economics in the direction of learning and innovation. It argues that the production of knowledge increasingly takes place in networks and that some of the old dichotomies which lie behind the formulation of government policy are becoming less significant. I have tried to show that the growing polarisation which is one aspect of the learning economy risks to undermine its social basis and that any strategy aiming at supporting the learning economy must include a New New Deal giving special attention to the strengthening of the learning capability of those who are weak in this respect.

What I have presented may also be regarded as a research agenda and as hypotheses which need to be tested. We know far too little about the interaction between the formation and distribution of knowledge and its impact on economic development. The role of different organisational forms in promoting learning in connection with routine activities (learning-by-doing, -using and -interacting) is one important issue. The further development of evolutionary theories and models so that they take into account human action and initiative is another. We also know far too little about how trust affects economic development. To further develop institutional economics so that it captures the different ways trust is built into our habits and norms is an important challenge. Using comparative analysis across countries and regions may be the most efficient way to understand many of these issues.

It should be recognised that economists cannot tackle these issues alone. There is a need for extensive co-operation between economists and experts in pedagogical and sociological disciplines. And to avoid a myopic perspective we will need to get some help also from historians and philosophers.<sup>10</sup>

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<sup>10</sup> At a mini-seminar in connection with the Inaugural, Christopher

The few years I spent as a bureaucrat at OECD were useful in many respects. The most important conclusion I reached was that there is an urgent need for a new paradigm both in economic theory and in economic policy. The pessimistic mode of thought emphasising that little can be done and the lack of co-ordinated efforts to solve major global problems can only be challenged by a new coherent set of ideas. The learning economy-perspective is one serious candidate in this context. The fact that it points to the possibility for establishing virtuous circles and positive sum games is important because it makes it attractive for different types of social actors. Important political personalities such as Clinton, Gore, Delors and most recently the British labour leader Tony Blair have formulated their visions in this direction already and as before in history it might be the case that practical men take the lead and leave it to academia to rationalise ex post what has already been put into practise. If they do, we must hope that they do not forget to integrate the social dimension in the strategy.

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Freeman presented a very interesting paper sketching a new theory of history and economic growth. His analysis of how different sub-systems interact in economic development offers a promising framework for understanding new broad social trends including the development toward a learning economy (Freeman, 1995).

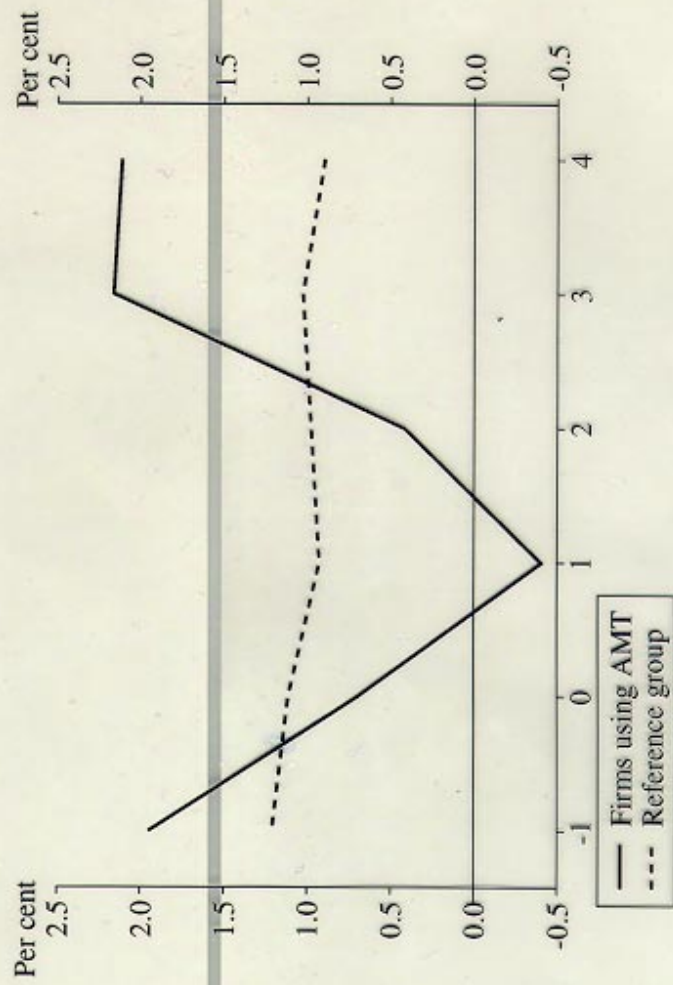
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## appendix

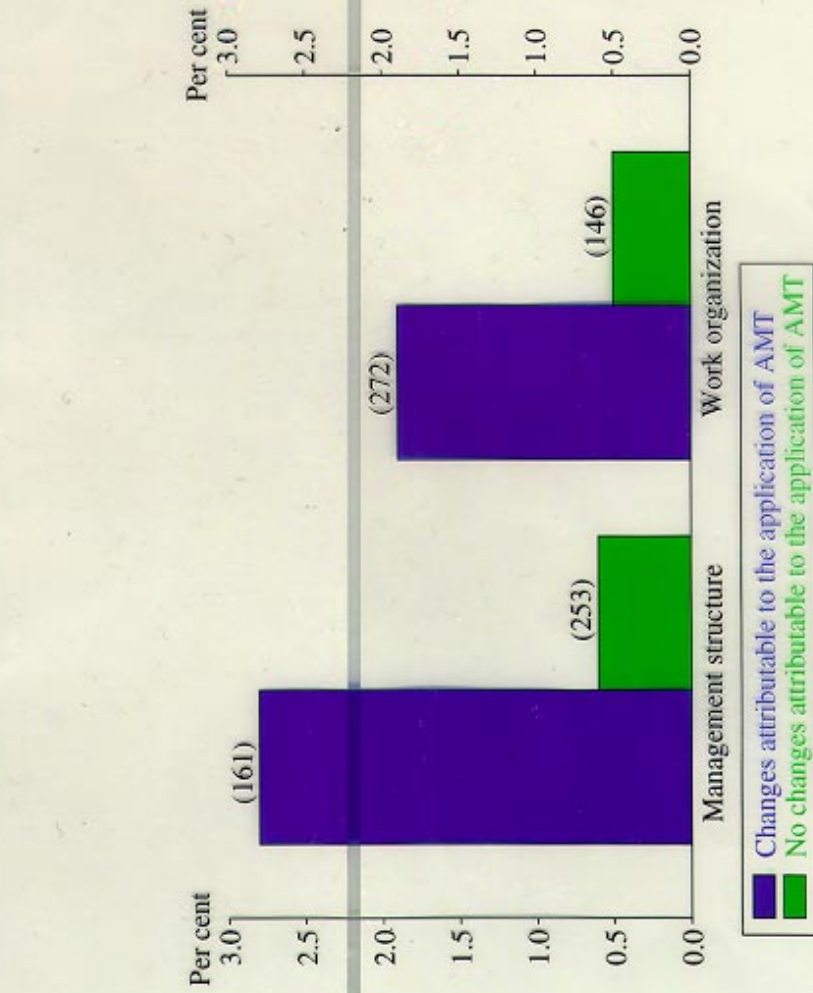
## ***The effects of AMT on productivity, year by year***



PLANC\_6

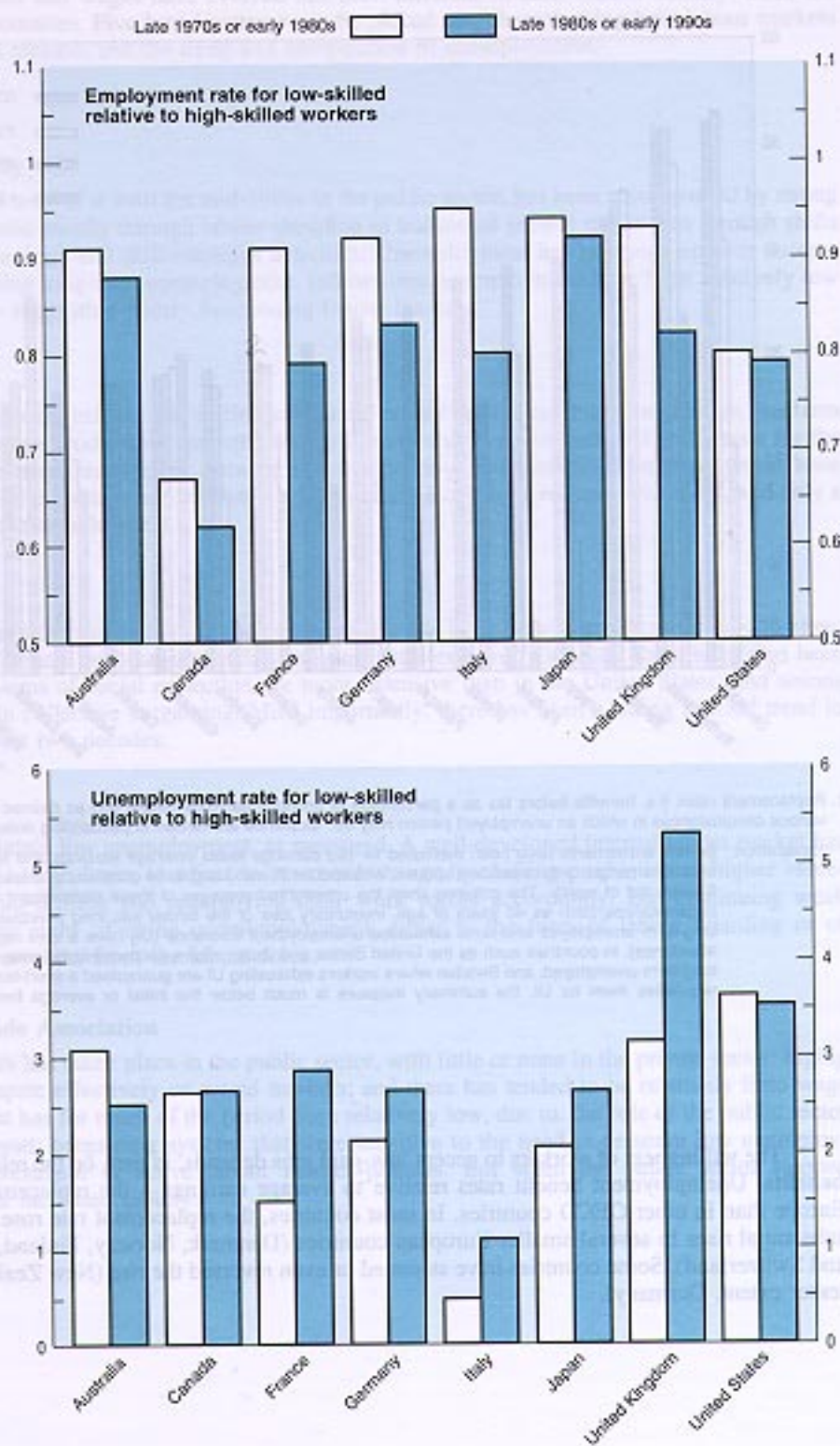


## Organisational changes and productivity growth, 1990-93



PLANC\_7

Chart 15. Employment and unemployment rate differentials by skill<sup>1</sup>



1. The adult male employment (unemployment) rate for the bottom quartile of the population (labour force) ranked by educational qualifications divided by the rate for the top quartile.

# **D**anish **R**esearch **U**nit for **I**ndustrial **D**ynamics

## *The Research Programme*

The DRUID-research programme is organised in 3 different research themes :

- *The firm as a learning organisation*
- *Competence building and inter-firm dynamics*
- *The learning economy and the competitiveness of systems of innovation*

In each of the three areas there is one strategic theoretical and one central empirical and policy oriented orientation.

### **Theme A: The firm as a learning organisation**

The theoretical perspective confronts and combines the resource-based view (Penrose, 1959) with recent approaches where the focus is on learning and the dynamic capabilities of the firm (Dosi, Teece and Winter, 1992). The aim of this theoretical work is to develop an analytical understanding of the firm as a learning organisation.

The empirical and policy issues relate to the nexus technology, productivity, organisational change and human resources. More insight in the dynamic interplay between these factors at the level of the firm is crucial to understand international differences in performance at the macro level in terms of economic growth and employment.

### ***Theme B: Competence building and inter-firm dynamics***

The theoretical perspective relates to the dynamics of the inter-firm division of labour and the formation of network relationships between firms. An attempt will be made to develop evolutionary models with Schumpeterian innovations as the motor driving a Marshallian evolution of the division of labour.

The empirical and policy issues relate the formation of knowledge-intensive regional and sectoral networks of firms to competitiveness and structural change. Data on the structure of production will be combined with indicators of knowledge and learning. IO-matrixes which include flows of knowledge and new technologies will be developed and supplemented by data from case-studies and questionnaires.

### ***Theme C: The learning economy and the competitiveness of systems of innovation.***

The third theme aims at a stronger conceptual and theoretical base for new concepts such as 'systems of innovation' and 'the learning economy' and to link these concepts to the ecological dimension. The focus is on the interaction between institutional and technical change in a specified geographical space. An attempt will be made to synthesise theories of economic development emphasising the role of science based-sectors with those emphasising learning-by-producing and the growing knowledge-intensity of all economic activities.

The main empirical and policy issues are related to changes in the local dimensions of innovation and learning. What remains of the relative autonomy of national systems of innovation? Is there a tendency towards convergence or divergence in the specialisation in trade, production, innovation and in the knowledge base itself when we compare regions and nations?

### ***The Ph.D.-programme***

There are at present more than 10 Ph.D.-students working in close connection to the DRUID research programme. DRUID organises regularly specific Ph.D.-activities such as workshops, seminars and courses, often in a co-operation with other Danish or international institutes. Also important is the role of DRUID as an environment which stimulates the Ph.D.-students to become creative and effective. This involves several elements:

- access to the international network in the form of visiting fellows and visits at the sister institutions
- participation in research projects
- access to supervision of theses
- access to databases

Each year DRUID welcomes a limited number of foreign Ph.D.-students who want to work on subjects and projects close to the core of the DRUID-research programme.

### ***External projects***

DRUID-members are involved in projects with external support. One major project which covers several of the elements of the research programme is DISKO; a comparative analysis of the Danish Innovation System; and there are several projects involving international co-operation within EU's 4th Framework Programme. DRUID is open to host other projects as far as they fall within its research profile. Special attention is given to the communication of research results from such projects to a wide set of social actors and policy makers.

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