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## The Danish model and the globalizing learning economy: Lessons for developing countries

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Research Paper No. 2009/18

## **The Danish Model and the Globalizing Learning Economy**

Lessons for Developing Countries

Bengt-Åke Lundvall\*

March 2009

### **Abstract**

Although Denmark shares with the other four Nordic countries certain attributes, such as pragmatic protestant religion, small and homogenous population, strong social democratic parties and ambitious welfare states, it also has its own characteristics. High degree of specialization in the so-called low-tech sectors, combined with high mobility and income security in labour markets (flexicurity), contributes to making the Danish system unique in the world. Denmark has experienced some stagnation in its growth over the last decade but still ranks among the top ten in the world in terms of GNP per capita, registered unemployment is less than 2 per cent (as of June 2008) while the inflation rate has remained moderate. These goals for economic policy have been realized in an environment with a high degree of income equality. In this paper we use the concepts ‘innovation system’, ‘the learning economy’ and ‘learning modes’ to analyse the evolution of the Danish model and what can be learnt from it. My

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**Keywords:** economic development, welfare state, social cohesion, innovation

**JEL classification:** O10, O16

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conclusion is that the developing countries can learn from Denmark's history. The integration of farmers and workers through self-organization, education and state guaranteed civil rights together with the emancipation of women and young people are historical factors that have established the foundation for the current success. Social cohesion and egalitarian working life support participatory organizational learning in a society characterized both by individualism and by high levels of trust and low levels of corruption.

## Acronyms

CIS3 Third Community Innovation Survey

DUI experience-based modes of innovation, referring to learning-by-doing, using and interacting

SMEs small- and medium-sized enterprises

STI science-based modes of innovation, referring science-technology-innovation chain

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## Summary

Denmark shares with the other four Nordic countries (Finland, Iceland, Norway and Sweden) certain attributes: pragmatic protestant religion, small and homogenous population, strong social democratic parties and ambitious welfare states. But it certainly has its own personality when compared to the other members of the Nordic family. High degree of specialization in so-called low-tech sectors combined with high mobility and income security in labour markets (flexicurity) are elements that contribute to making the Danish system unique in the world.

Over the last ten years, the Danish economy has performed well in economic terms. Denmark is ranked among the top five in the world in terms of GNP per capita, registered unemployment is now (June 2008) probably the lowest in the world (less than 2 per cent) while the inflation rate remains moderate. These goals for economic policy have been realized in an economy with a high degree of income equality. The current challenge for Denmark is to transform aspects of the system that hamper its performance (weakness in science-based learning and the integration of workers with a different cultural background) without undermining the key characteristics that have contributed to its success.

In this paper we use the concepts 'innovation system', 'the learning economy' and 'learning modes' to analyse the evolution of the Danish model and to determine what can be learnt from it. The Danish case shows that it is possible to establish a high level of productivity on the basis of experience based learning rooted in broad and intense social interaction. We point to 'congruency' and 'matching' as the two factors explaining the success of this egalitarian small-scale low-tech strategy.

- The high degree of 'congruency' within the national system. Different subsystems related to education, work and labour markets support and match the industrial structure of the small firm and the predominantly experience-based mode of innovation.
- The system matches well the current global regime: the globalizing learning economy. 'Flexicurity' and active labour market policy, networking and participation in organizational learning promote swift adaptation and incremental innovation.

The three most important lessons that can be drawn from the Danish case are:

- It is not necessary for a national economy to be specialized in high-technology products and science-based learning in order to grow rich.
- Social capital rooted in high levels of trust that support experience-based learning and worker participation in traditional sectors constitutes an important source of wealth.
- A system where the state interacts positively with civil society can manage the social and economic transformations necessary to remain successful in global competition.

Developing countries may learn from the history of Denmark. The integration of farmers and workers through self-organization, education and state guaranteed civil rights together with the emancipation of women and young people has established the foundation for Denmark's current success. Social cohesion and egalitarian working life supports participatory organizational learning in a society characterized both by individualism and by high levels of trust and low levels of corruption.

## **1 Introduction**

Every nation state has its own peculiar history. Nation-specific institutions and structures have proven resistant to globalization and they give each national system its own distinct ‘personality’. In any specific period certain national systems tend to perform better than others in terms of wealth creation and in terms of the quality of life that they offer their citizens. Is it possible to learn from the successful examples when designing development strategies in the rest of the world? The assumption behind this paper is that ‘learning-by-comparing’ is a fruitful exercise while ‘naive benchmarking’ where attempts are made to replicate isolated successful institutions or mechanisms defined as global ‘best practices’ may lead to unintended and negative consequences (Lundvall and Tomlinson 2002).

One way to explain why ‘naive benchmarking’ does not work is to take the national system of innovation as point of departure. This concept was developed in the middle of the 1980s (Freeman 1982; Lundvall 1985; Freeman 1987; Freeman and Lundvall 1988) and is now used worldwide as tool for analysis and policy. National systems of innovation differ in terms of what they do (industrial specialization), what they know (reflected in the patterns of patenting and publishing) and in how they work and learn (different institutions and different organizational forms). The most important dimensions of innovation systems are the patterns of interconnectedness and interaction among individuals and organizations.

## **2 National systems of innovation: contingency, congruency and adaptability**

National systems of innovation are open systems and the domestic pattern of interaction may be more or less well adapted to the global context. For instance, the national institutional set-up may be supportive to those generic technologies that offer the greatest opportunities in a specific economic era (Perez 1983; Freeman and Perez 1988). This implies that the performance of a specific national system is contingent and what appears to be a model for the rest of the world in one époque may turn out to be a failure at a later stage: the Japanese model was the envy of the world until the middle of the 1990s when it ran into problems of stagnation. In this paper we argue that Denmark benefits from an institutional set-up and a mode of learning that matches the current context of the globalizing learning economy well.

At the foundation of the evolution of the national system are processes of interactive learning among agents and organizations within the system. Such forms of interaction will tend to develop a certain degree of ‘congruency’ between the pattern of specialization in production and knowledge on the one hand and the institutions that frame economic processes and learning processes on the other. In this paper we argue that there is a good match in Denmark between the different elements of the system. The flexible labour market, the education system fostering personal competence and the system of lifelong training supported by the public sector match the industrial structure well; i.e., small-scale firms often operating in traditional sectors such as food, furniture and clothing or in different forms for the more or less advanced service sectors. Economic and social equality and related high levels of trust support interactive learning between organizations and high degrees of participation in organizational learning.

The state may play a more or less autonomous role in relation to the evolution of international contingency and internal congruency. When the system gets out of tune with the global context and/or when there is growing friction between the production system and the institutions that frame it, a new agenda for public policy will present itself. The state and the political process may in such situations prove to be more or less 'intelligent' when it comes to coping with the new threats and challenges. In some cases the path dependency will be too strong, and attempts and the current institutional set-up may be reinforced rather than redesigned. In other cases the outcome of social and political conflict may result in new directions of change. This will be reflected in the degree of adaptability of the system. In this paper we argue that the Danish history has fostered a certain adaptability in this sense. At the core of this adaptability, we find a positive relationship between state and civil society. This includes a specific history of tripartite interaction in labour market regulation where social partners interact with the state but it goes further than that.

## **2.1 Brief introduction to the structure of the Danish innovation system**

In Figure A1 of the Appendix we show that out of 36 countries in the European Innovation Scoreboard (EC 2006), Denmark is ranked as number five. The breakdown of the factors that constitute the background for this position is given in Figure A2, which shows that the major strength emanates from 'lifelong learning', diffusion of broadband services and from innovation activities in small- and medium-sized enterprises (SMEs). The proportion of young people who go on to further education and the proportion of those who graduate in science and technology is below or around the average and the same is true for both the public and the private R&D-efforts.

The Danish system of innovation is characterized by many SMEs with only a few (in international terms) large firms. In general, Danish firms are innovative (in making product, process and organizational innovations), but the innovations mainly take the form of incremental changes. A big share of the Danish manufacturing value-added, employment, and export is within low-tech industries (defined as industries with low R&D-intensity), although the share is decreasing. There are some exceptions from the traditional dominance of low- and medium-tech sectors, pharmaceuticals and other medico-related industries being the most important.

Low or medium R&D-intensity does not, however, mean that the production is not knowledge-intensive. In fact, production in many of the industries characterizing Denmark's so-called low- and medium-tech production is based upon extensive knowledge inputs related to a high degree of change and flexibility in firms' use of resources, including rapid diffusion of new technologies and frequent incremental product innovation that combines a high level of competence in industrial design with advanced organizational techniques and marketing methods. The innovations often reflect interaction between skilled labour, engineers, and marketing people.

## **2.2 Social and economic performance**

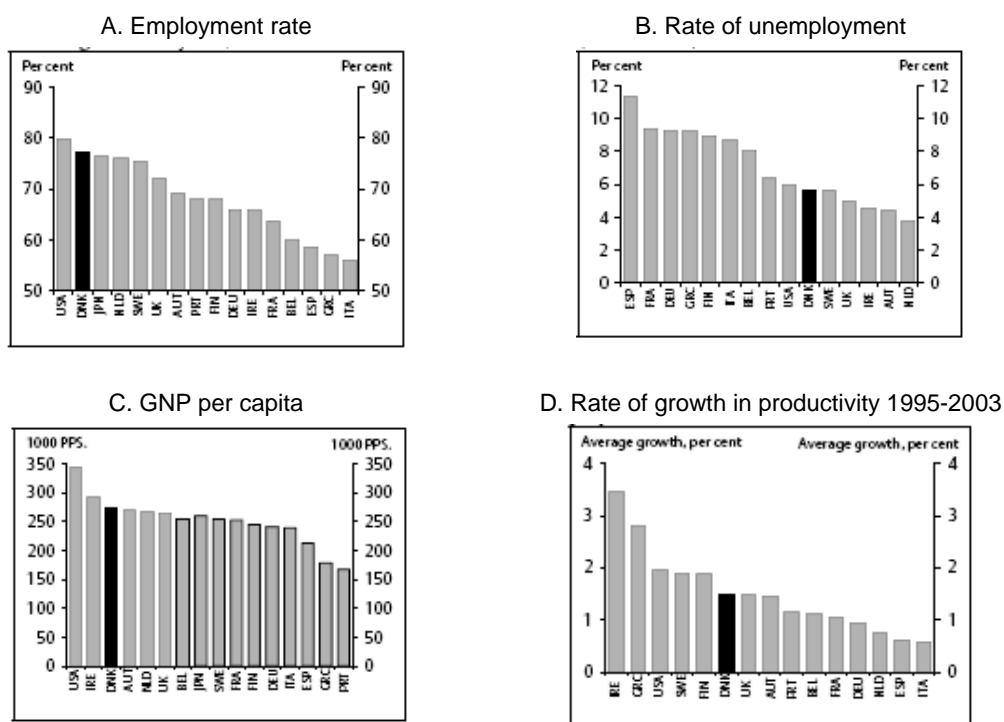
There are different ways to measure the performance of a national economy. The most common refers to GNP per capita. Denmark is doing well according to this measure. Actually it has been in the top-ten league in this respect for the last ten years. Behind this lies a high participation rate in the labour force in general and especially for

women. GNP per working hour or per active worker is less impressive but here the relative size of the public sector may be a factor that results in a downward bias (value added in public service does not include capital income). Measurement of productivity in the private sector puts Denmark in a more advantageous position.

The rate of unemployment is low (less than 2 per cent) and the rate of inflation has remained moderate (3.4 per cent). Foreign debt is low and has been reduced considerably over the last 15 years. Public debt is also low.

There are more ‘holistic’ and impressionistic attempts to measure the relative performance of national economies. In April 2005 the Intelligence Unit of the British weekly *The Economist* defined Denmark as the most attractive country in the world, as seen from the investor’s point of view. In recent years the World Economic Forum has presented rankings of international competitiveness where Denmark ranks among the top five.

Figure 1  
Denmark's position international comparison 2003



Source: [www.nationalbank.at/en/img/paper\\_kieler\\_tcm16-10452.pdf](http://www.nationalbank.at/en/img/paper_kieler_tcm16-10452.pdf)

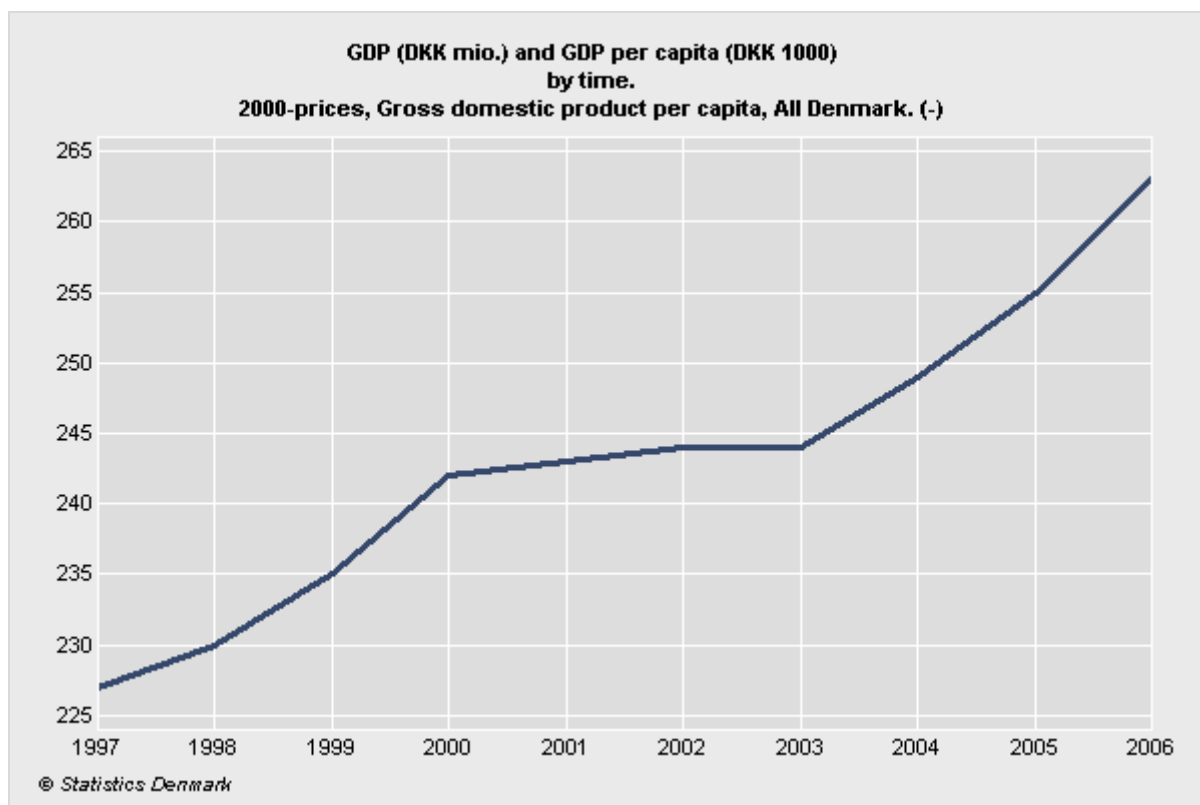
## 2.3 The trend in economic growth

The 1990s was a period of stable economic growth when real GNP/cap increased by around 4 per cent per year. The years 2000-03 were characterized by stagnation in GNP per capita. Since 2003 the economy has been growing at 3 per cent per annum. The global economic crisis will be reflected in 2008 as stagnation, and possibly negative growth rates for 2009.



The cost of living is high in Denmark, and this is reflected in the international rankings of Denmark's economic position. There are thus major differences in rankings based on PPP or in terms of USD. Denmark remains among the top five countries in the world together with Luxemburg, Norway, Iceland and Switzerland with respect to rankings in GNP/cap in USD. When GNP/cap is measured in terms of domestic buying power, Denmark's relative position has weakened in the new millennium, but still ranks among the 20 richest countries in the world.

Figure 2  
GDP per capita 2000 prices, 1997-2006 (DKK 1000)



## 2.4 Social performance

It is well-known that economic indicators such as GNP per capita are not perfect when it comes to evaluating social wellbeing. Therefore, international organizations, and especially the UN, have defined more complex measures that aim at capturing the social dimension more directly. In the most recent statistics—in terms of HDI-index weighting education level, life expectancy and GNP/capita in terms of PPP—Denmark ranks 13th among the 191 countries included.

Denmark ranks lower than Iceland, Norway and Sweden with respect to the human development index (HDI). One major reason is that while Denmark places high in terms of education level, life expectancy is lower despite the country's high living standards. Denmark has a shorter life expectancy (77 years) than more than 30 of the 191 UN-member countries and this has not improved over the last few years. While the Danish life expectancy for men is at the level of other European countries, it is lower for women. The emancipation of women has gone far in terms of integrating women in the labour market, but it has not completely freed women from the traditional responsibility

of taking care of children and housework. Also, women have imitated some of the bad habits of men: women in Denmark drink and smoke more than women in most other countries.

A third way to measure welfare is to ask citizens how they perceive the quality of their life. During the past 26 years, the world values surveys have asked more than 350,000 people how happy they are, using the same two questions: 'Taking all things together, would you say you are very happy, rather happy, not very happy, not at all happy?'. And, 'All things considered, how satisfied are you with your life as a whole these days?'. Here Denmark comes out at the top. Over the last decades there has been a significant increase in the happiness index in several countries, and not just in Denmark. According to this survey, Danes are the most satisfied people in the world (the response pattern might reflect the fact that each individual is in charge of his own happiness. Thus declaring yourself unhappy, would mean accepting the fact that you are responsible for your own failure).

## **2.5 A Danish paradox?**

Denmark has realized economic and social goals while developing an ambitious welfare state. This contrasts with the pro-market bias of standard economics as is articulated in the policy advice offered by international organizations such as the OECD and the World Bank. Big public expenditure, high and progressive tax rates and generous public social schemes have been characterized as hampering to growth. This general message has been re-enforced through references to the threat coming from globalization.

Globalization has thus been referred to as a threat to the welfare state. However, as we shall see, globalization does not affect welfare states uniformly, and the Scandinavian welfare model actually seems to prosper in the context of globalization. With respect to employment, economic growth and labour productivity, the Scandinavian countries have since 1990 outperformed not only continental European countries but also the neoliberal models of the UK and the US.

The paradox takes on an extra dimension in Denmark. Some of the success in Finland and Sweden may be explained by the extraordinarily heavy investments in R&D and in the strong-growth ICT-sectors. This transformation has not taken place in Denmark to the same degree where 'low technology' industries related to food, textiles and furniture still strongly contribute to exports. The absence of big multinational firms has been seen as another structural weakness of the Danish economy.

In this paper we will demonstrate that some of the assumed 'weaknesses' tend to become 'strengths' in the context of the globalizing learning economy where the capability and opportunity to learn are the key to success for individuals, organizations and regions. They form integral parts of an innovation system founded on experience-based learning. In this alternative universe, it is crucial for economic performance that a broad segment of the population is engaged in the processes of change where they interact to develop, implement and utilize new ideas. And it is here that we find the secret behind the success of the Danish model.

## 2.6 A Danish model?

In Denmark, as in the other Nordic countries, the most important setting for the labour market comes from the compromises between centralized trade unions and centralized employers' organization. This is in contrast to systems where rules are set through laws enacted by the state. There is a complexity of governmental laws that forms the framework for the relative autonomy of the concerned organizations. The most important is the state's mediation authority that can be called upon when disputes develop.

Galenson, the US labour market scholar who introduced the concept 'the Danish model' already in the early 1950s, refers (1952) mainly to this regulation mode and to the relatively peaceful relationships between capital and labour. In this paper we refer to a Danish model that covers a wider set of elements and their systemic interdependencies. We try to demonstrate that in the context of the current 'learning economy', there are several mechanisms supporting the dynamic performance of the Danish economy. The self-regulated labour market is part of this but there are several other dimensions related to the 'national system of innovation and competence-building' that need to be considered.

In the long run, 'adaptability' may be seen as the most fundamental prerequisite for sustained economic growth.<sup>1</sup> As we shall see, the adaptability of the Danish system has both a macro-political and micro-economic dimension. The macro-political dimension may be illustrated by the fact that in periods of crisis, the state, civil society and interest groups have interacted and established new frameworks for regulating and changing the system. This dimension is discussed in section 2. We see the micro-economic dimension of adaptability reflected in interactive learning and incremental innovation as one key element behind the strong economic performance. These processes get support from institutions related to education, training and labour market and this is the main theme for section 3. In section 4 we refer to the globalizing learning economy and we explain how the Danish systemic constellation of industrial structure, social cohesion and institutions results in strong performance based upon trust and interactive learning.

## 3 A history fostering adaptive policy learning

In this section, we highlight historical events that have resulted in a national system where state and civil society in Denmark are more in harmony than in most other national systems. We argue that this has resulted in a high degree of system adaptability in periods of crisis. We illustrate this by reviewing the postwar period, with a special focus on some of the policy changes that took place during the unemployment crisis of the 1970-90s.

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<sup>1</sup> This reflects that the current world is characterized by 'radical uncertainty'—the only certainty being that unforeseeable events will take place in the not too distant future. This can be illustrated during the last decades with China and India becoming major players in global competition, climate change emerging as a major concern, energy prices exploding and the relationship to fundamentalist Islam developing into a major concern for western countries. Just a decade ago, these were all factors seemingly to be of secondary importance.

### 3.1 The historical roots of the adaptive governance mode

Some crucial events in Denmark's history have shaped both the country's current socioeconomic system, and the patterns of interaction between state and civil society, summarized in Box 1. They may also be seen as milestones in the building of social cohesion in the Danish society since they were major steps in a process integrating farmers and workers as full citizens economically, socially and politically.

Of these dates, the year 1868 was crucial for the formation of a consensus-oriented strategy among decisionmakers. The ruling class had to give up colonial ambitions. The event took on a symbolic meaning and led to a shift towards a more introvert national strategy with a social dimension. The new slogan was 'what had been lost outside now must be regained domestically'. This implied a common effort aimed at building a strong nation and was specifically reflected in major efforts to establish a strong national education system.

It also led to a reorientation of corn exports towards Great Britain, thereby reducing the relative importance of the German market. The 1870s became a critical period of crisis and transformation, triggered by competition in the export market for corn from US and Russia. Danish agriculture had experienced a radical reduction in its exports to Great Britain and the agricultural sector had to be transformed. After more than a decade of painful adaptation—in which the formation of the farmers' cooperatives was a crucial element—the outcome was a completely transformed agricultural economy characterized by the export of livestock products such as butter and bacon, still with the UK as a major destination. A key element behind the transformation was the diffusion of farmers' cooperatives processing milk and, later on, meat products (1882).

A prerequisite for this transformation was a major social innovation; the introduction (1852) and rapid diffusion of 'people's high schools' (*folkehøjskoler*), based on the ideology of Grundtvig, a priest and social philosopher. As their major aim, these new institutions sought to educate the farmers and give them self-confidence both as producers and citizens. The transformation process was driven to a high degree by self-organization among the farmers but was also supported and legalized by the state. The constitution protected the formation of free associations and a new legislation supporting the formation of high schools was passed. Already at this stage, a mode of public policy interaction was developed whereby civil society and state supported each other, especially in periods of economic and social crisis. This mode was further developed through major social compromises that resulted in laws recognizing the rights of organized labour in 1899 and 1933, respectively.

In the postwar period, the building of the welfare state and further development of labour market institutions ruled by tripartite bodies reinforced this corporatist institutional set-up where centralized trade unions and employers' organizations took on major responsibilities in close cooperation with governmental authorities. The fact that in the postwar period (until 2001) neither the left- nor the right-wing governments had a solid majority in parliament contributed to a climate of consensus seeking. This form of governance in which the state and civil society interact parallels the specific form of economic dynamics where social equality and economic efficiency go hand in hand. In section 3 we indicate how the high degree of equality is transformed into social capital that fosters interactive learning.

Box 1  
Milestones in building national social cohesion in Denmark

1788	Land reform created a class of farmers who were freed from feudal bonds;
1852	The establishment of the first folk high school for the emancipation of farmers;
1868	The battle of Dybbøl, ending imperial dreams and triggering national reform;
1882	The first dairy factory with cooperative ownership;
1899	September Agreement recognizing rights for the organization of workers and employers;
1933	The Kanslergade Compromise on social reform among major political parties

### 3.2 Postwar macroeconomic performance and the formation of the modern welfare state

At the end of the war, there was wide concern of a new depression and an active economic policy was established that combined Keynesian active finance policy with income and wage policy. In the small and increasingly open economy, ‘international competitiveness’ was defined as a major objective. This was reflected in a series of ‘economic policy packages’ designed as social compromises in which the strong, highly centralized trade unions accepted wage restraint in exchange for social reforms that increased social security and job creation.

One long-term outcome was an unemployment support system that was more ambitious than in most other countries, both in terms of income coverage and the length of coverage period. Meanwhile, resources allocated to ‘active labour market’ policy were very limited until the 1970s and 1980s. Another critical element of the reforms was to establish public care for children and old people. This made all women, including those with small children, free to join the labour market and led, at the same time, to the creation of jobs attracting mainly women. As a result, the participation rate of women became higher than in almost all other countries.<sup>2</sup>

Just after the war the economy was still strongly dependent on agriculture and agro-food. The industrial base was quite weak, and private services and manufacturing were mainly connected either to private consumption, public sector or they involved agro-food, construction and shipping activities. The 1950s constituted a period of transition with a major transfer of labour from agriculture to manufacturing and services. Growth rates were high but so was the rate of unemployment. In the 1960s there was strong growth in public sector activities related to education, health, childcare and care for the elderly. Inflation rates became somewhat higher while rates of unemployment were low. The rate of labour productivity growth was high.

This economic policy strategy, aiming at full employment and controlling inflation by a combination of (stop-go) finance and incomes, ran into problems at the end of the 1960s

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<sup>2</sup> Normally, generous unemployment support is assumed to reduce the supply of labour. This assumption is not well supported empirically and in the case of Denmark, we can see the opposite effect. Participation rates are high in all worker categories, perhaps for the reason that in order to become eligible for unemployment support, workers need to be active in the labour market.

when deficits in balance of payment and public debt began to increase. The strategy was abandoned in the middle of the 1970s after a period of high inflation followed by stagflation.

### **3.3 A period of crisis and transformation, 1973-90**

In 1973, the rate of unemployment was at record low (40,000, i.e., less than 1 per cent) and when this coincided with the first oil crisis, inflation became high and accelerating. The subsequent period when restrictive economic policy led to high rates of unemployment lasted for almost 20 years, and it was not until 1990 that the rate of unemployment dropped below under 10 per cent. Since then, growth rates have been stable; unemployment has been shrinking year after year and is now far below what was assumed in the 1990s to be 'the natural rate of unemployment'.

These two decades witnessed changes in the strategy for economic policy that can be perceived as a period of correcting some of weaknesses in the Danish model. There was strong pressure to modernize the public sector, to make it both more productive and more service-oriented. Labour market policy became much more active. Access to unemployment support became more restricted for young workers. Joining the European monetary currency collaboration eliminated the active use of currency rate policy. Wage restraint was imposed more through high rates of unemployment than through explicit wage policy. There was also a shift towards a longer-term perspective on international competitiveness, moving the focus towards innovative capabilities and other non-price factors.

## **4 The institutional setting for labour markets and education**

### **4.1 Self regulation of the labour market: a key element of the Danish Model**

In the Danish model, similar to the other Nordic countries, the most important setting for labour market rules is based on compromises between the centralized trade unions and employers' organization. These rules create a framework that allows some lee-way for further specification at the sector level and there is even room for adapting the rules further to a specific firm or even to specific worker. This is in contrast to the systems in which rules are set by state laws.

There are complex governmental laws behind the autonomy of the relevant organizations. The most important is the mediation authority of the state that can be called upon when disputes develop. Strikes can be called off by the state and in this situation the mediation authority can force an agreement upon the parties. Normally, the compromise will be designed in such a way that it comes close to what would have become the final outcome of a conflict.

Galenson, the US labour market scholar Galenson (1952), refers mainly to this regulation mode of the relationship of capital and labour. The model has changed over time, especially with regard to the roles played at the central, sector, local and individual level in shaping wage and working condition but some basic characteristics still remain unchanged. The 1990s have seen a further decentralization of negotiations to the level of the single firm, but these negotiations have to respect the framework set by national and sector agreements.

In this paper we sketch a broader version of the Danish model. We try to demonstrate that in the context of the current ‘learning economy’, there are several mechanisms that support the dynamic performance of the Danish economy. The self-regulated labour market is part of this but there are other dimensions that are related to the ‘national system of innovation and competence-building’ that need to be considered.

#### **4.2 The education system and the characteristics of Danish comprehensive schools**

Central and local governments are the main providers of education at primary and secondary levels. Generally speaking, curricula, study programmes, textbooks, etc., as well as most teachers, acknowledge that supporting communicative and cooperative skills and ‘social competence’ is a major task of the school system. Informal institutions supporting interactive learning and innovation in the economy are provided by the school system, even when not explicitly recognized.<sup>3</sup>

It is somewhat trivial to state that there is mutual influence between a nation’s culture and its school system. National school system actually plays a crucial role in the formation of modern nation states. The history of education in Denmark has its own unique features. It is characterized by a combination of state responsibility for funding and for the quality of the schooling, but a high degree of freedom exists when it comes to organizing education according to different cultural values and pedagogical methods. The outcome of Grundtvig and his emphasis on people’s high schools where popular learning without formal diplomas took place among adults, still plays a role in shaping the debate regarding schools.

In Denmark young people and schoolchildren spend less time on homework than in other countries. Instead, they often use their free time to work and earn money for their personal consumption, at levels exceeding those afforded by children in other countries. Many of the young have appropriated a wage earner-role while still in school, achieving early independence, also economically, from their parents.

In the Danish primary and secondary school, the atmosphere is more democratic and informal than in larger European countries such as France, Germany and the UK. Pupils at an early age become accustomed to discussing with and questioning their teachers and other authorities; they also become accustomed to cooperating in groups. Taken together these elements in the framework of youth education encourage a number of personal qualifications: the ability to accept responsibility as well as to communicate and to work with others—qualifications meeting the requirements of modern firms that must operate in an extremely turbulent environment (Lundvall 2002).

#### **4.3 The labour market as a framework for knowledge creation and learning**

Denmark’s labour market, like its education system, has particularities that make it unique from an international perspective. These are essential in explaining the existence of a particular Danish mode of learning and innovation (Madsen 2006). High

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<sup>3</sup> Recently recognition of the importance of social skills has, however, become somewhat ambivalent. In the political debate on education, the proposition that too much time is devoted to social competence and too little to basic skills like mathematics, language and concrete facts about geography, history, etc., seems to be gaining more support.

participation rates, high mobility in terms of job changes, publicly organized and relatively generous unemployment support, considerable latitude for hiring and firing workers, and basic social security provided by a developed welfare state constitute some of the most important institutional characteristics of the Danish labour market. As a result the labour market is characterized by great flexibility with regard to job changes between workplaces, resembling in this regard the labour market in the US.

But in contrast to the US-model, the publicly organized system of unemployment support is more generous than in most other European countries. In the international context, it has a high substitution rate and a long period during which benefits can be drawn. This is reflected in surveys that show that Danish wage earners, despite frequent job changes and with little legally mandated employment security, express little concern over job insecurity, as compared to wage earners in other European countries (OECD 1997: 132 ff.).

As mentioned above, the Danes participate in the labour market to a much higher degree than the EU average. At first glance, this seems paradoxical, since the combination of a high tax burden and public subsidies should discourage active workforce participation. Economists have shown that, because of the tax system, a significant proportion of workers, especially women, gain little from being active in the labour market. One reason for remaining active may be that Danish workers, and women in particular, place considerable value on having a job and the individual independence it brings.

The high mobility in the labour market also reflects the Danish industrial structure with its large share of small workplaces and firms. As a result of this combination of high mobility and small workplaces, the incentives for employers to invest in the education of their own employees are weak. To compensate for this, Denmark has established a publicly financed system of continued education that is rather unique. Of the adult workforce, a greater proportion than in other countries continue with their education, and the public authorities use a greater share of GNP on adult education than anywhere else in the world. Thus, the public sector has taken on a role that the small Danish companies would have difficulty in fulfilling on their own.

#### **4.4 Consequences for learning and the modes of innovation**

A picture emerges in which competence in the Danish business life develops primarily through recruitment and only secondarily through the establishment of internal education and further schooling under the auspices of the firm. The high level of mobility is not limited merely to unskilled labour, but also applies to technicians, academics and even top management. This is the setting of the Danish firms for participating in the learning economy. The high mobility parallels the levels noted in high-tech regions such as Silicon Valley, and has both positive and negative aspects.

On the positive side, firms are able to recruit experienced employees from other firms. The relatively large flow of competent manpower between firms results in a rapid diffusion of new ideas through the economy. It also provides a foundation for interaction between firms, since workers to a great extent have relationships with colleagues in other firms.

These advantages are especially attainable for clusters of firms located in 'industrial districts', the agglomerations of firms that share a common industrial and technological



specialization In such regions, specialized labour markets will appear; these will have workers with a high level of competence, and the exchange of knowledge through job changes between companies will be intense. In such an environment, firms may also become more willing to invest resources in the education of their own employees, because they can count on a return on their investment indirectly in the form of new employees educated by other firms. In such a context, it is important to note that this is matched by labour market policy that is partially regionalized and involves representatives from trade unions and employee organizations.

## **5 The learning economy as context**

While the postwar period in Denmark has been characterized by periods of up- and downturns, long-term success is reflected in a high GNP per capita, and the economy performs in the current situation quite well. In order to explain the relative success of the Danish economy, it is necessary to understand the global context within which it operates.

### **5.1 The learning economy**

In various contexts, we have introduced a concept using the term ‘the learning economy’ (Lundvall and Johnson 1994; Archibugi and Lundvall 2001). The intention is to mark a distinction from the more commonly used term ‘the knowledge-based economy’. The learning economy concept signals that the most important change is not the more intensive use of knowledge in the economy but rather that knowledge becomes obsolete more rapidly than before; therefore it is imperative that firms engage in organizational learning and that workers constantly attain greater competence and new skills.

Extensive utilization of information technology has become a prerequisite for competitiveness. In all parts of the economy, including the so-called low-technology sectors, the use of scientific knowledge offers new opportunities for firms. Codified knowledge is becoming more important than before, especially in high-income countries. But these changes, in conjunction with global competition, increase the rate of transformation and change. As a result, both individuals and companies are increasingly confronted with problems that can be solved only by forgetting old methods and acquiring new ones. The rapid rate of change is evidence of an intensified competition, leading to a selection of organizations and individuals capable of rapid learning, and thus further accelerating the rate of change.

The transition to a learning economy confronts individuals and companies as well as national institutions with new challenges. For the individual, it becomes imperative to be able to upgrade skills or to have access to new ones over one’s lifecycle. Finding a workplace where there are opportunities to learn new skills may become more important than the initial high salary. In the education system, a strong emphasis on teaching basic subjects as language and mathematics needs to be combined with the promotion of what is sometimes referred to as ‘personal skills’ or ‘social skills’. The capacity to learn becomes essential in the learning economy; it is problematic that the national Pisa-tests do not emphasize these areas of competence.

At the level of the firm, we can see the growing emphasis on new organizational forms that promote functional flexibility and networking as responses to the challenges posed

by the learning economy. In a rapidly changing environment it is not efficient to operate a hierarchical organization with many vertical layers and with departments and functions operating separately within the firm. It takes too long to respond when the information obtained at the lower levels has to be transmitted to the top and back down to the bottom of the pyramid. In many instances big vertically integrated companies are less effective than the smaller units engaged in relational contracting and networking. An increasingly important dimension of competition is how attractive a firm is for labour and this will be reflected in the learning opportunities that it offers its employees. This is correlated to the degree of participation and autonomy offered to workers.

The challenge for national economies is to combine a strong science base with national institutions that promote individual, organizational and inter-organizational learning. Labour markets may combine high mobility with strong public investments in training or less mobility with strong investment in in-house training. In a recent paper (Jensen et al. 2007) based upon Danish data, we demonstrate that firms that combine a strong version of science-based learning with a strong version of experience-based (organizational) learning are the ones that are most innovative (see Box 2).

The strong performance of the Danish economy reflects micro-relationships in the system that are supported by institutions such the welfare state, gender relationships, education and labour markets (discussed above). We would argue that the performance reflects the fact that the system is especially effective in terms of DUI-learning. In a global context (the globalizing learning economy) where the rate of change is high, the resulting incremental innovation processes and adaptive capacity have been the keys to success.

Box 2				
Combining science-based (STI) and experience-based (DUI) modes of innovation promotes product innovation <sup>4</sup>				
The table below, taken from Jensen et al. (2007), is based upon a clustering of 692 Danish firms. The odds ratio compares the propensity to innovate using the low learning cluster (either DUI or STI) as benchmark. Also when sector, size and ownership are brought in as control variables, we find that firms that combine the use of scientific knowledge with organizational learning are more than twice as active in terms of introducing product innovations as the firms that are robust only in one of these two dimensions.				
Variables	Odds ratio estimate	Coefficient estimate	Odds-ratio estimate	Coefficient estimate
			With control variables	
STI cluster	3.529	1.2611**	2.355	0.8564**
DUI cluster	2.487	0.9109**	2.218	0.7967**
DUI/STI cluster	7.843	2.0596**	5.064	1.6222**
N	692	692	692	692
** means significant at the 1% level.				

<sup>4</sup> STI refers to the chain science, technology and innovation, while DUI refers to learning by doing (Arrow 1962), by using (Rosenberg 1982) and by interacting (Lundvall 1985; Lundvall 2006).

## 5.2 The high level of trust

In the US-dominated literature, trust is considered to be rooted in civil society and the frequency of participation in civic activities has been used as an indicator of ‘social capital’ (Woolcock 1998). It has been said that big government and big public sectors undermine civil society, and thereby also social capital. The Scandinavian experience shows that growth in a welfare state has not reduced the participation in civic organizations and that levels of trust are much higher in the Scandinavian countries than in countries with a much smaller public sector. In particular, there is a strong correlation between the use of general (rather than selective) social welfare programmes and generalized trust.

According to the European Social Survey, trust among agents seems to be consistently higher in Denmark than elsewhere (see Table 1) and this, combined with the small size of the system, results in a high degree of interaction among agents both within and across organizations. This gives rise not only to low ‘transaction costs’ but more importantly to processes of interactive learning where new insights about technologies and good organizational practices are diffused rapidly and at low ‘learning costs’. The Danish innovation system, although rather weak until recently in terms of its production of codified knowledge through its R&D-efforts, has been highly successful in terms of learning by doing, learning by using and learning by interacting.

The high frequency of interaction is reflected both in industrial networking and in the patterns of work organization. In the next section we illustrate, first, that innovating Danish firms are more engaged in collaboration with customers and competitors than the average for Europe and that workers are more engaged in ‘discretionary learning’ than in other countries with the exception of the Netherlands.

Table 1  
Index of trust in 14 European countries based upon the European Social Survey

	2002	2004	2006
Denmark	7.2	7.0	7.2
Finland	6.7	6.7	6.7
Norway	6.8	6.8	6.9
Sweden	6.4	6.3	6.5
France	5.0	5.1	5.1
UK	5.3	5.3	5.6
Germany	5.2	5.2	5.2
Netherlands	5.9	6.0	6.0
Belgium	5.2	5.2	5.4
Ireland	5.7	6.0	5.6
Austria	5.3	5.5	5.4
Spain	5.0	5.0	5.3
Hungary	4.5	4.3	4.5
Switzerland	5.9	6.1	6.1

Note: In the European Social Survey, respondents are asked two questions (‘Do you trust most people?’ and ‘Do you think that most people would take advantage of you if they got the chance?’) with responses varying between 1-10. The index gives the average response.

## 5.3 Networking, interactive learning and innovation

According to the Third Community Innovation Survey (CIS3), Danish firms collaborate with other firms more frequently than the average in Europe (Christensen et al. 2008).

Table 2 shows that this is true for collaboration within the same concern as well as for collaboration with competing firms and customers. Collaboration with universities has grown from a very low level of 17 per cent in 1998 to the EU average which is around 30 per cent.<sup>5</sup> The high frequency of inter-organizational collaboration, which we assume to reflect high degrees of trust, is of great importance for the innovative performance of an economy where there are only few major big companies.

Table 2  
Collaboration partners, 1998-2000

Collaboration partner	Total CIS3-DK	Total CIS3-EU
Firms within same concern	65	42
Suppliers	60	61
Clients and customers	55	50
Competitors	34	29
Consultants	46	41
Private labs and R&D firms	22	22
Universities & other higher education institutes	29	31
Public & private non-commercial research centres	21	20

Note: CIS3-DK is based on an extended population including supplementary data from construction and selected service industries in order to fit the Danish R&D statistics. CIS3-EU is equivalent to the Eurostat dataset.

Source: The Danish Institute for Studies in Research and Research Policy (2003), CIS3-DK, Table 15 & CIS3-EU, Table 32a.

#### 5.4 On the importance of learning at the workplace

We have argued that the Danish education system and the labour market institutions support participatory learning at the workplace. In the last sections of this paper we will present an analysis how work and learning take place in the different European economies supporting this option.

Lorenz and Valeyre (2006) develop an original and informative EU-wide mapping of how employees work and learn in the private sector. This mapping makes it possible to see to what degree Danish employees are engaged in learning at the workplace.

Cluster analysis is used to identify four different systems of work organization:

- Discretionary learning
- Lean
- Taylorist
- Traditional forms.

Two of these, the discretionary learning and lean forms, are characterized by high levels of learning and problem-solving on the job. The principal difference between discretionary learning and lean clusters is the relatively high level of discretion or

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<sup>5</sup> Christensen, Drejer and Vinding (2004) find that collaboration on product development has not increased between 1997 and 2004, but the pattern of collaborating partners has changed: firms have more different types of partners, and collaboration with knowledge institutions has increased significantly. Especially collaboration with universities increased from 17 per cent to 29 per cent, much the same pattern as that noted in CIS.

autonomy exercised at work by employees grouped in the former. Task complexity is also higher in the discretionary learning cluster than in the lean cluster.

Discretionary learning thus refers to work settings where a lot of responsibility is given to the employee who is expected to solve problems on his or her own. Employees operating in these modes are constantly confronted with 'disequilibria' and as they cope with these, they learn and become more competent. But in this process they face also the experience of having some of their earlier insights and skills become obsolete.

Lean production also involves problem-solving and learning but here the problems are more narrowly defined and the set of possible solutions more limited. The work is highly constrained and this points to a more structured or bureaucratic style of organizational learning that corresponds rather closely to the characteristics of the Japanese inspired 'lean production'-model.

The other two clusters are characterized by relatively low levels of learning and problem-solving. The taylorist form leaves very little autonomy to the employee in making decisions. In the traditional cluster there is more autonomy but learning and task complexity are the lowest among the four types of work organization. This cluster includes employees working in small-scale establishments in personal services and transport where methods, for the most part, are informal and non-codified.

Table 3 shows that people working in different national systems of innovation and competence, work and learn differently. Discretionary learning is most widely diffused in the Netherlands, the Nordic countries and to a lesser extent in Austria and Germany. The lean model is in evidence mostly in the UK, Ireland and Spain. The taylorist forms

Table 3  
National differences in organizational models  
(% of employees by organizational class)

	Discretionary learning	Lean production learning	Taylorist organization	Simple organization
North				
Netherlands	64.0	17.2	5.3	13.5
Denmark	60.0	21.9	6.8	11.3
Sweden	52.6	18.5	7.1	21.7
Finland	47.8	27.6	12.5	12.1
Centre				
Austria	47.5	21.5	13.1	18.0
Germany	44.3	19.6	14.3	21.9
Luxemburg	42.8	25.4	11.9	20.0
Belgium	38.9	25.1	13.9	22.1
France	38.0	33.3	11.1	17.7
West				
United Kingdom	34.8	40.6	10.9	13.7
Ireland	24.0	37.8	20.7	17.6
South				
Italy	30.0	23.6	20.9	25.4
Portugal	26.1	28.1	23.0	22.8
Spain	20.1	38.8	18.5	22.5
Greece	18.7	25.6	28.0	27.7
EU-15	39.1	28.2	13.6	19.1

Source: Adapted, based on Lorenz and Valeyre (2006).

are more present in Portugal, Spain, Greece and Italy, while the traditional forms are similarly more common in these four southern European countries.<sup>6</sup> Within the Nordic group, Denmark is the extreme in terms of its high share of discretionary learning and low share of taylorist workplaces.<sup>7</sup>

Table 4 indicates the unequal access to learning in different parts of Europe. Denmark and Netherlands have few taylorist jobs remaining in the economy, as the majority of employees operate in jobs that are demanding both in terms of skills and in terms of autonomy. We see this as a major explanation of the success of the Danish economy in the current context of rapid change.

### **5.5 Degree of inequality in access to organizational learning in Europe**

An egalitarian income distribution may not be the most important dimension of social equality. If it is combined with a widening gap in competence between the skilled and the low-skilled workers, it could result in the underemployment of the low-skilled. From a more theoretical welfare point of view, Sen (1999) argues that inequality should be related more to capabilities than to the static distribution of income. The data referred to above on organizational models of learning in different European countries makes it possible to find indicators of the more dynamic and adequate measures of inequality.

In Table 4 we present an indicator for the inequality of workplace learning opportunities. We distinguish between ‘workers’ and ‘managers’ and we compare their access to discretionary learning in different national systems.<sup>8</sup> Table 4 shows that employees at the high end of the professional hierarchy have easier access to jobs involving discretionary learning. This is true for all the countries listed. But it is also noteworthy that the data indicate that the inequality in access to learning varies across different countries. Denmark, together with Netherlands, has the lowest ‘inequality index’. This index is much higher in the Anglo-Saxon countries and in the south of Europe.

For instance, the proportion of the management category engaged in discretionary learning in Portugal is almost as high as in Finland (62 per cent in Finland and 59 per cent in Portugal), but the proportion of workers engaged in discretionary learning is much lower in Portugal (18.2 per cent versus 38.2 per cent).

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<sup>6</sup> Lorenz and Valeyre (2006) use logit regression analysis in order to control for differences in sector, occupation and establishment size when estimating the impact of nation on the likelihood of employees being grouped in the various forms of work organization. The results show statistically significant ‘national effect’ also when controlling for the structural variables, thus pointing to considerable latitude in how work is organized for the same occupation or within the same industrial sector.

<sup>7</sup> In Arundel et al. (2007) we have shown that there is correlation between the discretionary learning mode and the frequency of radical innovations when different European national systems are compared.

<sup>8</sup> The class of managers includes not only top and middle management but also professionals and technicians (ISCO major groups 1, 2 and 3) The worker category includes clerks, service and sales personnel as well as craft, plant and machine operators and unskilled occupations (ISCO major groups 4 through 9).

This pattern indicates that the Danish society is the most egalitarian not only in terms of income distribution, but also with respect to access to learning; its distribution is more equal than elsewhere. The combination of the welfare state's offer of some kind of basic security, equal income distribution and low social distance is reflected in high degrees of trust and in a broad participation in change. While there are tendencies towards polarization in the current context also in Denmark, it still benefits from social capital rooted in an egalitarian society that supports interactive learning and dynamic economic efficiency.

Table 4  
National differences in organizational models  
(% of employees by organizational class)

	Discretionary learning	Share of managers in discretionary learning	Share of workers in discretionary learning	Learning Inequality index*
North				
Netherlands	64.0	81.6	51.1	37.3
Denmark	60.0	85.0	56.2	35.9
Sweden	52.6	76.4	38.2	50.3
Finland	47.8	62.0	38.5	37.9
Austria	47.5	74.1	44.6	39.9
Centre				
Germany	44.3	65.4	36.8	43.8
Luxemburg	42.8	70.3	33.1	52.9
Belgium	38.9	65.7	30.8	53.1
France	38.0	66.5	25.4	61.9
West				
UK	34.8	58.9	20.1	65.9
Ireland	24.0	46.7	16.4	64.9
South				
Italy	30.0	63.7	20.8	67.3
Portugal	26.1	59.0	18.2	69.2
Spain	20.1	52.4	19.1	63.5
Greece	18.7	40.4	17.0	57.9

Note: \* The index is constructed by dividing the share of 'workers' engaged in discretionary learning by the share of 'managers' engaged in discretionary learning and subtracting the resulting percentage from 100. If the share of workers and managers is the same, the index equals 0, and if the share of workers is 0, the index would equal 100.

Source: Lundvall, Rasmussen and Lorenz (2008).

## 6 What lessons can be learnt for development strategies?

The Danish society is based on a high degree of trust among its citizens. This makes transactions less costly and interactive learning more efficient. It might appear as a paradox but the kind of 'social capital' that lies behind the dynamic efficiency of the economy emanates from the security offered by the welfare state. American scholars see public expenditure as being equal to 'transaction costs' (North 1996) and the welfare state as undermining social capital (Putnam 1993; Fukuyama 1996). The experience of Denmark and the other Nordic countries points in a different direction.

As the public sector has taken over some of the responsibility for the care of children and the elderly, it has contributed to the creation of a highly individualist social system where traditional social institutions such as family and religion play a minor role. The welfare state and the individual's legal and social rights make it possible for all population segments (women, youth and old people) to become sovereign subjects. This

makes generalized interpersonal trust an attractive option (and somewhat of a necessity for individual survival). The downside is that it places a heavy responsibility on each individual for managing his/her own happiness. Failure to succeed may result in serious crises for the individual (or, in an extreme case, suicide). It is a normative question how far the less developed countries want to go in this direction.

Another critical element behind the dynamic efficiency of the Danish system is the homogeneity of the population in terms of ethnicity and culture. This homogeneity contributes to generalized trust, low transaction costs and efficiency of interactive learning. Today, this strength has induced some negative consequences, as reflected in the unsatisfactory work and social integration of peoples with different ethnical and cultural background. The only way out of this problem consistent with Danish history would be to invest massively in education and training to make it possible for the newcomers to become full—and fully accepted—members of the ‘Danish village economy’ (Maskell 2004). The alternative would be either to dismantle central elements of the Danish model or to engage in promoting selective immigration of high skilled workers.

Some important lessons that can be drawn from the Danish experience are historical. The current success reflects a high degree of social cohesion and the historical background for this was:

- The early rise of a broad based and democratic system of education: the first law on generalized basic education was introduced already in 1814;
- The social, economic, cultural and political emancipation of farmers and workers in which the social struggle resulted in peaceful reform processes. Local democracy goes far back in history while general suffrage for parliament was established 1915.

One important lesson to be drawn from the current strong performance may be the potential benefits from ‘flexicurity’ as a way to organize the labour market. The combination of high flexibility in labour markets (few restrictions on employers for firing employees and high rates of inter-organizational mobility) and income security for those becoming unemployed seems to be especially effective in the current context where there is a need for both high mobility and commitment to change among workers and citizens.

Another important lesson is that the broad participation of workers in the decisionmaking process is an advantage in an environment characterized by rapid change, and that such broad participation needs an active labour market policy as well as investments in education and training for both the young generations and for adult workers. The Danish example illustrates how this kind of participation can flourish in a society with a high degree of social and economic equality.

The history and current reality of Denmark, in some respects, are very far from the reality of most developing countries. Nonetheless, the Danish model may be useful in orienting development strategies. Also when the starting point is modest, development strategies could constitute a parallel effort for upgrading the professional skills of workers and farmers, as well as their self-confidence through broad education on the one hand and on the other, a gradual enhancement of the role they play in the transformation of working life and society.



The Danish case shows that successful national innovation systems may be reinforced by upgrading the skills of farmers and linking the upgrading of the knowledge base of agriculture to the formation of new industries. It is only in the most recent years that science-based economic activities and high technology sectors have begun to contribute substantially to economic growth in Denmark.

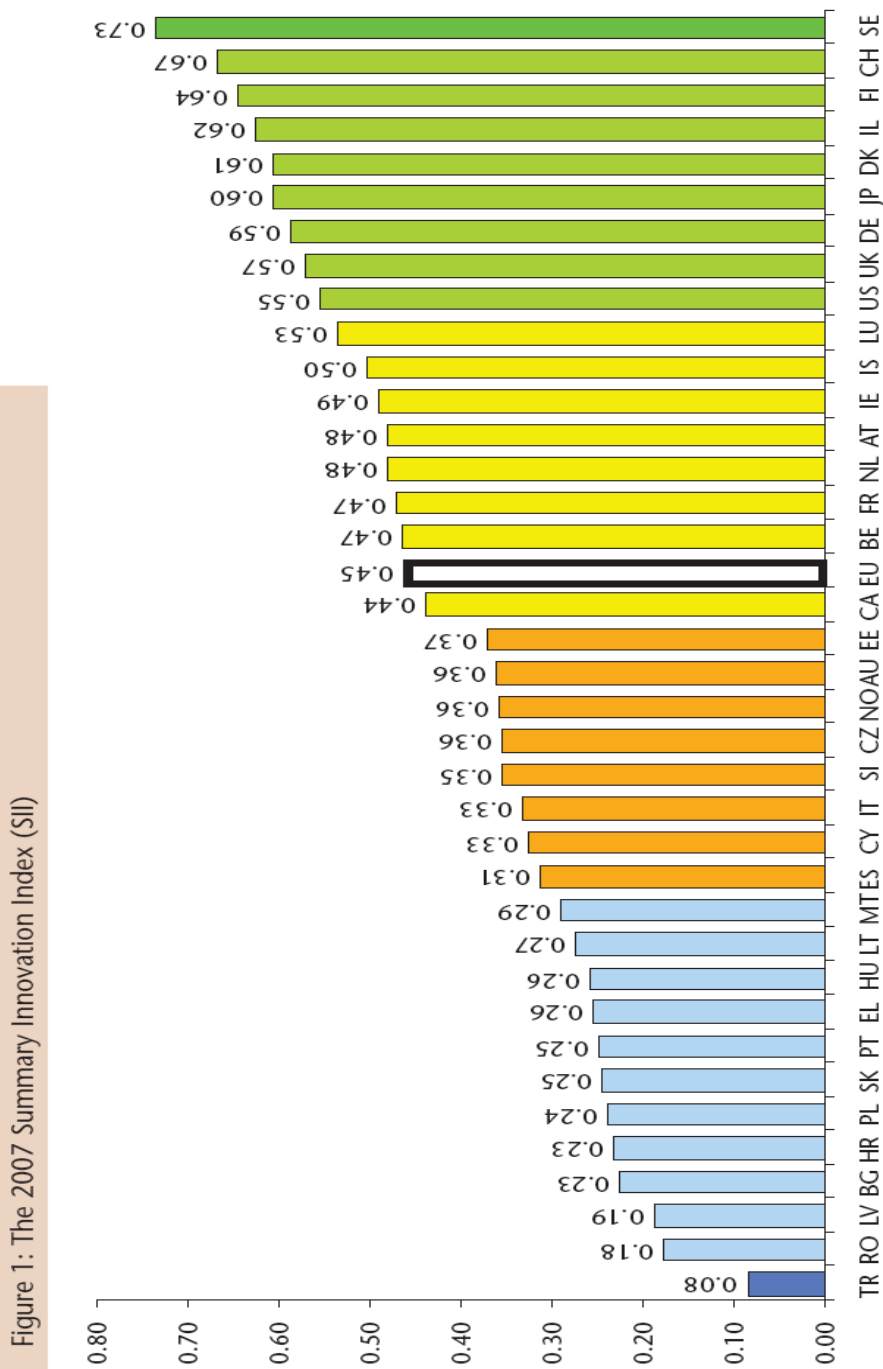
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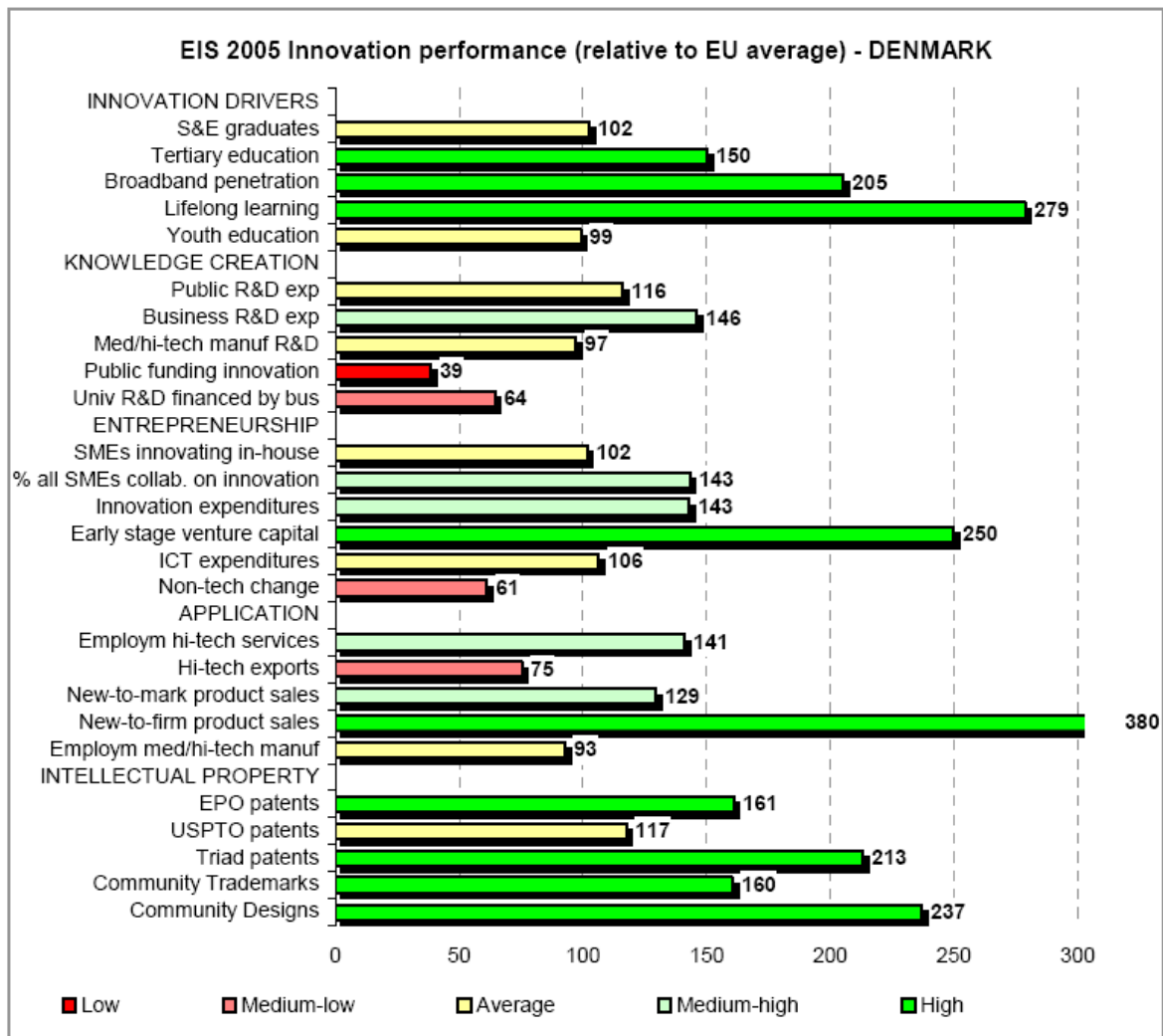
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# **Appendix 1: Innovation index ranking 36 countries and indicators of innovation performance for Denmark**



Source: European Commission (2006).



Source: European Commission (2006).