



ØRESUND UNIVERSITY
14 collaborating universities

Self-evaluation Report for the Øresund Region to the OECD/IMHE-project:

*“Supporting the Contribution of Higher Education
Institutions to Regional Development.”*



Final version presented to the OECD evaluation team
November 2005

FOREWORD

This report is the self-evaluation report of the Øresund Region to the OECD-project "Supporting the Contribution of Higher Education Institutions to Regional Development". This self-evaluation report has been compiled from February to October 2005. The report has been written by staff at the Øresund University, the collaboration organisation for the HEIs in the region. Data has been gathered via desk research, a number of interviews with representatives from regional organisations, and a questionnaire sent to the 14 member institutions.

Steering Group

A Steering Group has had the overall responsibility for the compilation of the report. The members of the Steering Group are:

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The Steering Group has had three meetings during the self-evaluation process: April, June and September 2005.

Working Group

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EXECUTIVE SUMMARY

This self-evaluation report is the contribution of the regional stakeholders in the Øresund Region to the OECD/IMHE-project: “Supporting the Contribution of HEIs to Regional Development”. The report deals with the HEIs in the Øresund Region, how the HEIs contribute to the development of the region today and how the contribution can be improved. A steering group with members from the HEIs, public authorities and business and industry has managed the compilation of the report. The report was submitted to OECD in November, 2005 after final approval from the parties involved.

Contents and structure of the report

The impact of the HEIs is measured on four interrelated areas:

- The Øresund Region and its educational system (Chapter I and II)
- Labor Market (Chapter III)
- Research, Innovation and Development (Chapter IV)
- Cultural and Social Development (Chapter V)

For every chapter there is a summary of the findings and a number of visions and challenges listed.

The main findings are summarized in Chapter VI and in the figure below:

Main results

The self-evaluation report finds that the HEIs in the Øresund Region have made several important contributions to the development of the region. In headlines, the findings are:

- The HEIs have a major impact on the region with more than 150,000 enrolled students in a large variety of courses and programmes.
- The HEIs in the Øresund Region perform research at the highest international standards.
- The Øresund Region is the 5th largest research centre in Europe, and the HEIs and companies of the region interact locally with high intensity.
- The HEIs in the Øresund Region contribute to innovation and high-tech entrepreneurship through technology transfer, commercialization of knowledge and collaboration with industry.
- The HEIs impact industry through research results and education and training of researchers.
- The HEIs supply highly skilled graduates to the labor force and continues to up-date the competencies of the labor force.
- The HEIs impact the labor market as large organizations with many employees.
- The HEIs are acting to increase social mobility in the Øresund Region.
- The society perceives the HEIs as crucial to the development of both physical and economic structures
- The HEIs in the Øresund Region do more than technology transfer – they play a major role in the development of the cultural and social life in the region.
- The HEIs act as places where worlds meet and “ports of knowledge”.
- The HEIs contribute to the upkeep and enhancement of the large amount of human capital in the Øresund Region.
- The HEIs have made a crucial contribution to the creation of the Øresund Region.
- The HEIs have influenced greatly on the physical planning in the region.

Contribution of HEIs to Regional Development in the Øresund Region

The Øresund Region and its educational system (chapter 1+2)

- 150.000 enrolled students in a large variety of programmes and degrees on 14 HEIs.
- Several “one-of-a-kind” institutions in the area attracting students and researchers nationally as well as internationally.
- Great deal of collaboration, especially the Summer University takes advantage of the competencies found in the region.
- Universities strengthen the on-going region building by bringing students and researchers together and collaborate on other regional issues.
- Visions and challenges:
 - Implementing the Bologna model in the whole region.
 - Further educational co-operation.
 - Further internationalization.
 - Stronger decision-making competencies.
- IN SHORT: The HEIs in the Øresund Region offer high quality education and strengthens the cross-border collaboration.

Research and innovation (chapter 4)

- The HEIs are *ports of knowledge* – places where global flows of researchers and students, ideas and innovations meet the Øresund region.
- Contribute to innovation and high-tech entrepreneurship through technology transfer, commercialization of knowledge and collaboration with industry.
- The research is top ranking globally.
- Science parks are important engines for business development
- Visions and challenges:
 - Further professionalize technology transfer process and innovation and commercialization of knowledge by pooling resources and reducing number of actors.
 - Improve access to venture capital in all innovation areas.
- IN SHORT: Major European Research Center and high local interaction between HEIs and business and industry.



Labor market (chapter 3)

- The HEIs supply highly skilled graduates to the labour force and continues to update the competencies of the labour force.
- Key actors in the on-going rise of knowledge intensive industries and businesses.
- Positive impact on minority related problems – gender, ethnic groups and social classes.
- Create new businesses and jobs through science parks and incubators.
- HEIs are important localizing factor for business investment planning.
- Visions and challenges:
 - Further improve employment possibilities for graduates.
 - Further contribute to the development of skills in more peripheral parts of the region.
- IN SHORT: HEIs are major contributors to the development of the knowledge-based economy in the region.

Social and cultural development (chapter 5)

- Create human capital through the education of an increasing number of students.
- Create social capital and thus impact on the high quality of life in the region.
- Positive impact on cultural environment, like development in the cities, cultural life, vibrant city life.
- The link between business and companies and culture/creativity are of increasing importance. The Universities are large sources of these resources.
- The HEIs are important businesses (attract large public investments, which results in many jobs, creation of events, museums, public gardens etc.)
- Visions and challenges:
 - More active engagement with cultural institutions to further develop the region.
 - Establish an organization like the platforms of Øresund Science Region within the field of culture and events.
- IN SHORT: HEIs are major contributors to the cultural life in the region.

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Abbreviations

Abbreviation	
KU	University of Copenhagen
CBS	Copenhagen Business School
DTU	Technical University of Denmark
RUC	Roskilde University
DPU	The Danish University of Education
DFU	The Danish University of Pharmaceutical Sciences
DB	The Royal School of Library and Information Science
KVL	The Royal Agricultural and Veterinary University
KARCH	The Royal Academy of Fine Arts – School of Architecture
ITU	The IT-University of Copenhagen
LU	Lund University
Mah	Malmö University
HKr	Kristianstad University
SLU	The Swedish University of Agricultural Sciences
HUR	The Greater Copenhagen Authority
Øresund DK	The Danish part of the Øresund Region
Øresund SE	The Swedish part of the Øresund Region, also sometimes referred to as Skåne
ØU	Øresund University
ØSR	Øresund Science Region

THE RISE OF THE KNOWLEDGE ECONOMY: AN ØRESUND PERSPECTIVE

In this short introduction we focus on:

- Knowledge economy: Globalisation and the new division of labour.
- Research and development as driving forces in the knowledge economy.
- The increased number of students and universities and the growth in time spent on formal education.
- The importance of knowledge in traditional production and new business areas.

Introduction

The countries in the western world have over the past three decades undergone a process of radical change. The transition from industrial society to knowledge society is penetrating most aspects of society; science, politics, economics and culture are being affected as well as many other areas. Knowledge is a wide term used to describe different areas such as technology, science, research, education, organisation and business know-how.

The on-going development is unlike other periods of transition due to the high velocity of the transition. Earlier periods of transition in the world have been characterised by their slow pace, e.g. the transformation of Europe from agrarian society to industrial society. Even though that period is relatively short in comparison with other transitional periods it still took several generations to carry through. In fact, the period of transition lasted from the end of the middle ages and well into the 20th century, so in comparison it was far from the present transformation, where changes happen from year to year.

But what is the on-going transition all about? Basically it is about turning knowledge into a competitive edge. The knowledge economy refers to the use of knowledge to produce economic advantages and benefits. The question in that regard is why knowledge has become such an important term in Denmark, Sweden and basically the rest of the western world? To understand the development thoroughly it is necessary to pay attention to the process of globalisation. Globalisation is a wide term used to describe an abundance of different processes. Many of these processes influence the traditional features of national and regional markets. The processes open up for competition between markets in different parts of the world that were previously separated. In that way competition stretches over a much larger economic and geographical area. This leads to several interesting effects. One of the most debated is the new international division of labour. Traditional manufacturing and production are outsourced or relocated to low-wage countries outside the traditional centres in Western Europe and North America. As much traditional production halts in Denmark and Sweden an increasing need to focus on how to keep up the competition and safeguard the present wealth is crucial. This is for instance done through improving the educational systems and focus on more knowledge intensive industries, where competition on price is less important. In other words the development emphasizes the need for high-cost countries to have high levels of education in order to compete with firms, regions and countries around the world having their advantages in low wages. Knowledge, then, is what the countries in the western world need to withstand the competition in the globalized world.

The importance of research and development

As mentioned above the transformation from industrial society to knowledge society is characterised by an unprecedented pace. Major changes within technology (computers, electronic entertainment), communication (World Wide Web, e-mails, cell phones), transport (commercial airliners, metro systems) have happened within decades. The first steps were taken after World War II. At that time the countries in Western Europe, North America, Japan and Australia experienced a remarkable period of stable economic growth. The prosperity gained was spent on massive investments in education, research, housing, infrastructure and much more. Especially the increased flow of resources to research meant that major technological breakthroughs occurred. The invention of the transistor (1947), integrated circuit (1957) and microprocessor (1971) were notable milestones. All of them

were to have major impact on the society in the proceeding decades. The changes came to define an epoch that marked the end of much of the old fashioned heavy industry, and were quickly labelled in different ways (e.g. the post industrial society, the information society etc.). In that period much of the traditional industry in the large cities in e.g. Denmark and Sweden were challenged by the cheap costs of similar products from Asia and Southern Europe. This was especially evident within i.e. shipbuilding.

And the development has continued until today. Research and development accounts for a steadily growing share of value added in production and trade. This is just one sign of a growing knowledge based economy. Among others is the expansion in formal education, the founding of a growing number of Higher Education Institutions (HEIs) alongside with the wide expectations to the advantages of science and research. All of these are clear indications of a more thorough transformation of society. It is not just a question of growth in the volume of knowledge based on qualified research. This knowledge is also finding its way to parts of society that were largely unaffected by the work of researchers 10-15 years ago.

In Sweden research has become the fastest growing industry from the beginning of the 1990's and until 2005:

“ [...] professional services have recorded considerable growth – composing e.g. technology trading firms, financial services, IT consultants, technological consultants and advertising firms. The single greatest area of growth was in the field of research, including both state financed university research and privately financed research outside the manufacturing sector. ”¹

University research and higher education has in both Sweden and Denmark been largely financed and regulated within a national framework. The demarcation between science and industry has remained quite clear throughout most of the 20th century, even though relations have become gradually more intense. But it is not until the last couple of decades that science and industry have engaged themselves more intensively in partnerships with one another. As will be presented later on in this report the number of different public-private partnerships is growing rapidly. This should improve the use of research conducted and fertilize for further sharing of research, economic and human resources.

This nails one of the main issues in the rise of the knowledge economy. It is a much-debated topic in not just the Scandinavian countries, but in most of the western world: The urge for improved research and development. The mantra seems to be that if we cannot compete on price, we need to add other qualities and aspects into products and services. In many instances this means having the technological lead and be able to develop and manufacture cutting edge technological entertainment, pharmaceutical products as well as high quality food products and much more. This has lead to a remarkable increase in the research and development as more and more resources are put into the different markets. It has become a dominant feature in the knowledge economy for the speed of technological development to be on the increase.

Education, education, education

One of the clearest indications that the knowledge economy is of growing importance is the increase within education. On all levels a remarkable increase can be spotted. More people than ever before attend higher education. The number of higher education institutions has been increasing steadily since the introduction of the knowledge economy - a complex web of educational options is found in both Denmark and Sweden.

As mentioned above the time spent on formal education has grown remarkably during the last 100 years. During this period the time spent on education has grown from an average of around three years to eleven years today². This development has mainly taken place in the post war period. Before World War II less than one percent

¹ Törnqvist (2002): p. 57.

² Törnqvist (2002)

received higher education – today this figure has increased dramatically, of an age cohort in Sweden 40% receives higher education. In that regard universities are no longer elite institutions, but have turned into an educational option for the masses. The number of universities has increased as well to respond to the demand. Of the 12 universities in Denmark today, just five existed before 1917. The majority of the newer universities were established after World War II. This is in many instances the same picture in Sweden, where 10 universities existed before 1917. Today this number has been quadrupled, making the exact number 40. In both Sweden and Denmark the new universities have been distributed geographically even in order to create equal educational possibilities for all people in the countries.

Another important matter is the supplementary training and in-service training for those already a part of the labour force. In order to upgrade the qualifications and supply the labour force with knowledge that can improve their skills this area has been heavily concentrated on. In fact, Denmark and Sweden are far ahead in Europe in terms of spending on supplementary training. Both private companies and public enterprises in the two countries are surpassing most other countries in terms of supplementary training a recent analysis shows³. It is the first time that an analysis takes into consideration both public and private expenses in the area. Denmark spends 4.8 billion euro per year on supplementary training, which corresponds to 25% of the total investment in education. According to the analysis, private companies spend 2.1 billion euro per year on supplementary training. It corresponds to 3% of the labour costs and consequently Danish companies spend more than the other EU-countries. Sweden is very close to the high Danish levels, spending 2.8%. Closest to the two top countries is Holland.

The importance of knowledge in traditional production and in business areas

As mentioned above the forces of globalisation have caused a new global division of labour. Much of the traditional industry within manufacturing has been outsourced or relocated to the low-wage countries of e.g. Southeast Asia and Eastern- and Central Europe. Some observers suspect that the process of globalisation will increase competition from low wage countries, leading to stagnation in real income and an increasingly unequal income distribution. The fear is based on the erosion of the former valuable characteristics of the high-cost countries. An economic strong domestic market is no longer an advantage when transportation costs are negligible. In that regard it has been argued that the development of new products and services along with improved business know-how (branding, communication, human resource management, business management) will be of increased importance.

Naturally, knowledge has always been a crucial factor in the development of new products, services and business areas as a whole. All progress implies new knowledge. But today there has been a major shift in the use of knowledge:

“[...] the emphasis was previously on the use of knowledge and skills to convert raw materials and semi-manufacturers into finished products. What has emerged now is that information has become per se the most important input and at the same time, the new product. The strategic machinery is no longer that which processes the material but rather that which facilitates the information processing and the control and steering of production processes. [...] For the first time in history, the human intellect is a direct productive force, not just a vital element of the production system.”⁴

Thus, the concept of “human capital” is extremely important in the knowledge economy. The pool of human capital is large in the different regions of Denmark and Sweden, where the educational level is high. But competition from other parts of the globalised world will increase in the years to come, thus forcing regions to improve education, collaboration between HEIs and companies and much more.

³ Source: <http://www.copcap.com/composite-8499.htm>

⁴ Törnqvist (2002): p. 55

Combining the different parts of the argument above leads us to the conclusive comment: Knowledge is becoming a crucial factor for economic development in high-cost countries. The presence of strong research institutions (public or private, universities or companies) as well as institutions for knowledge transfer into society is a prerequisite for growth in the 21st century.

CHAPTER I: ØRESUND – A CROSSBORDER REGION: AN OVERVIEW

Main points in this chapter are:

- The Øresund Region is a cross-border region comprising southern Sweden and eastern Denmark.
- It is a strong centre for economic growth.
- Denmark's capital city Copenhagen lies at the heart of the region with its abundances of HEIs, high-tech industries and research parks.
- Economic forecasts show that the region is growing in significance among its European counterparts.
- The Øresund Region is home to 3.6 million people.

1.1. Introduction

The Øresund Region comprises Skåne, the southern part of Sweden, and the eastern parts of Denmark as figure 1.1 shows. The waters between the two countries, the Øresund, which also have given the region its name, are so narrow that the two countries can be seen from one another. Although the region only make up for 4% of the countries' total area, no less than 27% of the total population of Denmark and Sweden live in this region. Øresund Region uses two languages and two currencies: the Swedish and Danish languages are however very similar, and most people understand the spoken word of the neighboring country, the currencies are both called kronor, Swedish and Danish respectively, yet have different exchange rates⁵.

Figure 1.1: Geographical overview of the Øresund Region



Source: Øresund Network AB.

Fact box 1.1: Overview of the Øresund Region

Øresund Region comprises Sjælland, Lolland-Falster, Møn and Bornholm in Denmark and Skåne in Sweden.

The total area is 20,859 km², which equals 4,3% of Denmark and Sweden's total area.

Total population: 3,6 million
Øresund DK: 2,4 million
Øresund SE: 1,2 million

Øresund Region holds 27% of Denmark's and Sweden's total population.

To a large extent, the early history of Denmark and Sweden is a chronicle of struggles for power, wars and rivalry between neighbouring countries. But in the past, the two countries have on many occasions also displayed a willingness to co-operate, even though it took a long way to get where we are today.

⁵ The Swedish currency is called *kronor*, the Danish *kroner*.

The rich waters of the sound between Sweden and Denmark have for centuries attracted people to settle in what is nowadays known as the Øresund Region. From the Viking Ages to 1658 Skåne was an integral part of Denmark, but was conquered by the Swedes in 1658. The Danes however did not recognize the Swedish rule of their former territory and wars raged between the neighbouring countries until the beginning of the 19th century. Throughout the whole period, Skåne remained Swedish. This meant that the Danish cultural heritage slowly disappeared. And even though Skåne is located at geographical periphery of Sweden, it was under heavy influence of the language and customs of the Swedish kingdom. On a big scale the cultural and linguistic differences between Denmark and Sweden are minor, but the rivalry made the Øresund more than a water to cross. The Øresund created a mental barrier that had a negative impact on the former strongly integrated region.

The situation between the countries meant that close cooperation was rare. It was not until well into the 19th century that thoughts and ideas of a closer co-operation slowly began to emerge. On a national scale changes did not take place before the 1950's and 60's.

In the meantime both Denmark and Sweden had developed into some of the richest countries in the western world and a friendly atmosphere came to replace the former hawkish attitude between the countries and co-operation on a national level was realised through i.e. Nordic Council in 1952 and Nordic Council of Ministers formed in 1972. Both these councils have had a major impact on the Øresund co-operation on a national level⁶. Other plans – for instance a defence union and a close economic co-operation (NORDEK) – never became realised, and from the 1960's Denmark pursued a policy of closer association with the large trade partners in the European co-operation, whereas Sweden because of Finland and the Soviet Union, remained outside. Denmark joined the European Economic Co-Operation in 1973, whereas Sweden and Finland joined the EU in 1995.

From the 1970's and 80's a number of ideas of bilateral cooperation across the Øresund came to the surface. The narrow sound binding the Swedish and the Danish coast together, had since the late 19th century encouraged the thought of building a fixed link between the two countries. The objectives from a Swedish point of view were intelligibly clear: The possibility of getting a faster and more convenient transport option to the rest of the EU. But on a regional level other objectives also were important: Skåne could obtain great advantages in creating a cross-border partnership with Sjælland. From being a region on the outskirts of Sweden it could regain status as one of the most central places in Scandinavia. From a Danish perspective it was obvious that a fixed link could create a new market for the largest city of the region, Copenhagen. To a large extent it could therefore be assumed that the fixed link in a Danish context was solely a regional matter. From a Swedish perspective, however, the bridge was both a regional and a national matter.

Furthermore, both Copenhagen and Malmö had severe economic difficulties in the 1980's and early 1990's. The heavy industries (ship building, automobile assembly plants, textile factories etc) that once employed a vast number of workers in both cities had ceased to exist, and both cities now faced soaring unemployment rates and decreasing population. The building of a fixed link was viewed upon as a mean to revitalise the cities and create new optimism and growth.

With massive investments in infrastructural projects (besides the bridge, a new railway was built to Copenhagen International Airport, which was also expanded, a new metro was built in Copenhagen, and in Skåne several highway projects were initiated), optimism returned to a region that was severely affected by the recession of the last decades. Several architecturally remarkable buildings has also been built: the Turning Torso in Malmö by architect Santiago Calatrava, Copenhagen Opera by architect Henning Larsen and the (re-)development of the harbour fronts in Copenhagen, Malmö and Helsingborg to mention a few.

⁶ Source: <http://www.norden.org>

The 16 km fixed link over the Øresund, the Øresund Bridge, was completed in 2000. The building of the bridge quickly came to symbolise the new regional cooperation. One year earlier the two national governments expressed for the first time their common vision, when a joint document named *Øresund – a Region is Born* was published⁷. Companies, HEIs and other actors on the regional scene welcomed the bi-national project of establishing a region making the two countries join hands and cooperate on many different levels. Many ideas and visions for the future were brought along in order to stimulate the development of a powerful region.

Today - just a few years after the opening of the fixed link - a larger number of actors have set the scene for a region well on the way. Many HEIs, NGOs, regional and national businesses and other actors support the undergoing development. Foremost among the political organisations is the Øresund Committee from 1993, which is the platform and meeting place for local and regional politicians from both sides.

From 1996-2000, an Interreg IIA-programme existed for the development of the Øresund Region. The program had a budget of DKK 140 million. In the period 2000-2007 an Interreg IIIA-programme is in place for cross-border integration in the region. The total budget of this programme is EUR 31,26 million. As for both programmes, funds are only available if the applicants put a similar amount into the project.

In 2003, OECD undertook a Territorial Review of the Øresund Region, and among the recommendations was that the region should pursue a path of “light institutionalism” to support regional development. Since then, networks have condensed and in the coming chapters it will be shown how the HEIs in the region have been among the forerunners in this process.

1.2. The Creation of the Øresund Region

Now it is time to take a closer look on the main reasons for the region building and creation of the Øresund Region. The region was established on background of two strong, simultaneous forces in the late 1980's, early 1990s:

The first was the **Glocalisation**, i.e. the combination of the internationalisation of the markets, increased free trade, improved communications etc and the rising importance of the region/the local. This macro-economic trend gave rise to the hope that the former industrial centres in the region, left in severe crisis after the demise of the manufacturing economy (Malmö and Copenhagen in particular) could once again become centres of growth and economic development. For this to happen, a bridge between the two largest cities (Copenhagen and Malmö), was essential of several reasons: 1) a massive investment in infrastructure would create jobs and generate optimism, and 2) the total sum when adding Copenhagen and Malmö would be larger than the sum of its parts. Somehow, somewhere, synergy effects would arise from creating a joint region consisting of Malmö and Copenhagen.

This line of thinking was found in the City of Copenhagen and in the City of Malmö, and also the Danish government. Copenhagen and Malmö both faced severe crises, and in that situation, a new project to create optimism was much needed. The larger the vision, the better, and the creation of a joint region was the project that could unite the actors.

Today, this vision is stronger than ever. Creating a region, strong on economic development by joining parts of two countries is the aim of many organisations (Øresund Committee, Øresund Science Region etc) today.

⁷ Denmark's and Sweden's Governments (1999)

The other was a number of **Geopolitical events**. The fall of the Berlin Wall in 1989, the demise of the Warsaw Pact and the Soviet Union a few years later also created a new neighbourhood for the Scandinavian countries. Sweden and Finland, for 40 years living in the shadow of the mighty neighbour to the East, joined the European Union, and the countries around the Baltic Sea joined both EU and NATO. Sweden, still in the early 1990's, was home to large manufacturing companies, and in order to improve their access to the European markets, better infrastructure was needed. The vision – personated by Mr. Gyllenhammar, at that time the CEO of Volvo and the European Round Table – was a transport corridor from Oslo down the Swedish West coast, across the Øresund at the narrowest point between Helsingborg and Helsingborg, through Denmark and via bridge across the Femern Belt directly to Germany.

This line of thinking found support in Sweden's government. Viewed from here, a bridge across Øresund was a part of repairing the “missing links” in Scandinavia's access to the European markets – and as such about infrastructure. Creating growth and development in peripheral Southern Sweden was not part of the reasoning. With the increasing importance of other markets than the Western European, proponents of this line of thinking are now advocating improved infrastructure across the Baltic Sea.

In 1991, the Danish and Swedish governments **decided to build** a bridge across the Øresund between Copenhagen and Malmö. The decision thus favored both lines of thinking – building a bridge across the Sound provided easier access to the European markets for the Swedish industries, and by locating it between the two largest cities in the region rather than at the narrowest point, the proponents of boosting the economies of Copenhagen and Malmö also had their share. As an (unanticipated?) consequence, the more political project of creating some sort of region encompassing both sides of the Øresund was initiated. The local and regional politicians formed the Øresund Committee in 1993, the HEIs established their formal collaboration, Øresund University, in 1997, a new administrative unit, Region Skåne, was formed in Øresund SE in 2000 and so on. Region Skåne was also formed with the regionalisation of the economy as backdrop (see more about Region Skåne in section 1.4.).

By 2000, when the bridge was ready, it was now perceived in the region as a means to an end, and by at least some of the national policy makers as the end of a project. Regional stakeholders have ever since been arguing for the two national governments to remove barriers and provide better conditions for the new region, whereas national policymakers have had to consider the implications of the region building process – will a new region like the Øresund Region change the delicate balance between different parts of the country?

A strong Øresund Region is likely to change the balance between the different parts of the countries. **In Denmark**, it is an East-West balance that needs to be upkept. Copenhagen is, somewhat unusual for a national capital, situated on the very eastern border, and furthermore, the capital is home to approx 30% of the total Danish population. To avoid tensions between the large capital and the rest of the country, national investments have to be spread out across the country. The building of the Øresund Bridge was thus followed by infrastructure projects in the West, building motorways between the cities of Jutland. Part of the national policy is a desire to have research and higher education in all parts of the country, and an even stronger concentration of national research funds etc to Copenhagen HEIs is thus politically very touchy. The national policies for research and higher education do not take the Øresund Region into consideration, and there is thus no co-ordination with the Swedish policies for research and higher education in Øresund SE. Speaking of regional development, Copenhagen is the capital, and almost by definition, regional development is not about developing the capital. For the city of Copenhagen, an essential question is whether it is the capital of Denmark, or the centre in a new, economically strong Øresund Region?

The question of **regional balance in Sweden** is extremely delicate in the political debate. The balance is to be kept between the Northern parts of the country, being sparsely populated and dependent on forest products and

state subsidies, the Southern parts (=Øresund SE), and the middle, home to the capital Stockholm and large, manufacturing industries. Until 10-15 years ago, both the North and the South was economically and politically dependent on the middle (=Stockholm), but with the region building process in the South, a potential new economic (and political?) centre has emerged: the Øresund Region. The region can – and is – both be coined in terms of threats and opportunities. The opportunity is that an economically stronger South will generate jobs and growth and tax revenue for the better of Sweden. The threat is that one third of the Swedish economy becomes orientated towards Copenhagen rather than Stockholm. The further north in Sweden, the less support is found for encouraging the region in the South. Regional development in Sweden is traditionally about developing (or providing life support to) communities from the middle of Sweden and up.

Summing up, two projects and visions were brought into reality with the building of the Øresund Bridge. One was about infrastructure: the Swedish industries in the middle of Sweden needed better access to the (Western) European markets. By 2000, when the bridge was ready, new infrastructure projects were already on the way to provide access to the Central and Eastern European markets. The strongest proponent for this project was the Swedish government, whereas the Danish government accepted it as part of a general development of the Danish economy, that by 1990 was deep into recession.

The other project/vision was about creating a region that could compete with other large European cities such as Amsterdam, Hamburg, Berlin, Helsinki and (yes, indeed) Stockholm. This project was the more political one, and it has gathered support from regional stakeholders. Today, the project is picking up pace, as networks between different societal actors have been created, widened and deepened. The region is constructed, and is such it is constantly under change and reconfiguration. By 2005, development in the region is about creating a strong, economic centre with growth in the knowledge intensive economy.

The **challenges** ahead for the Øresund Region are about:

- Legitimizing the project vis-à-vis the national governments. The argument that needs to be made is that the region building process is not a zero-sum game for Denmark and Sweden, but rather a positive development, whereby international investments will flow into the region, creating jobs, growth and tax revenue not only within the region, but also in the two nation states. The Øresund Region is no threat to either Denmark or Sweden, but rather is a possibility for creating a strong centre for economic growth in southern Scandinavia that can compete with the large, European cities.
- Regional Leadership. Which actor – or group of actors – will undertake the responsibility of leading the region? So far, the region has developed through a series of networks and cross border institutions, but will these turn out to be viable in the longer run? Can – and will? – the HEIs continue their heavy involvement in the region, or will they perhaps even take lead? Or will the Danish structural reform lead to the formation of a suitable partner for Region Skåne, allowing the local and regional politicians to take lead once again?
- Will the region continue to be a Danish-Swedish cross border region, or will Copenhagen in the long run outweigh the Swedish part? Øresund SE has used the region building process to redefine itself from a peripheral region in Sweden to one half of the successful Øresund Region, but the Danish part of the region is larger in terms of population and economy, and Copenhagen undoubtedly has ambitions of being the centre. Tensions between Danish and Swedish stakeholders are likely to arise if the current optimism is replaced by an economic setback.

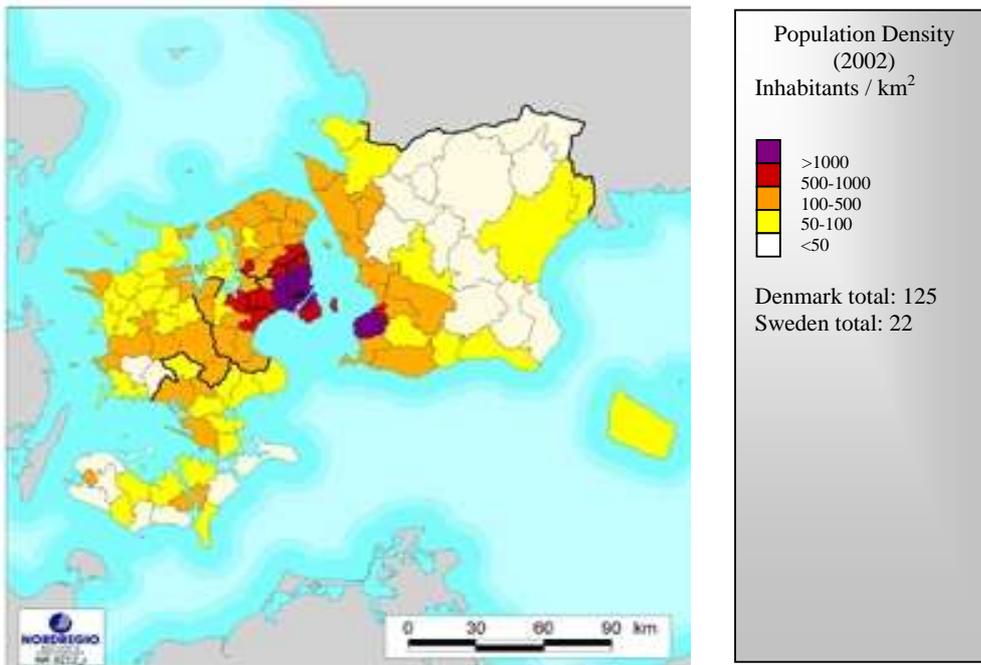
1.3. Geography and population

Geography

The Øresund Region, a cross-border region, is subject to a number of geopolitical features. First, the region is part of Scandinavia as well as the Nordic countries, a distinct group of countries – considered to be efficient, competitive and highly transparent from an international perspective⁸. The Nordic combination of both high welfare and economic growth is often emphasised as a positive combination in order to create equal and social secure societies. Second, the region is situated at the Baltic Rim with an advantageous location where goods flow between Scandinavia, the Baltic countries and the rest of Europe⁹. The Øresund Region is easily accessed from anywhere in the world. The major hub is the Copenhagen International Airport, offering direct links to more than 120 destinations worldwide and being the seventh largest in Europe in terms of cargo¹⁰.

The largest city in the region is Copenhagen, the capital of Denmark, home to about 1,5 million people. Other cities in Øresund DK are Roskilde, Elsinore to mention a few, though much smaller in population and size than the capital. In Øresund SE, the major cities are Malmö, Helsingborg and Lund. Malmö is the largest with a population of about 260,000. A key difference between Øresund DK and Øresund SE is that the latter does not hold the national capital; Stockholm is situated 600 km north of Skåne.

Figure 1.2: Population density



Source: www.nordregio.org.

As figure 1.2. shows, the areas closest to the waters of Øresund are most attractive for settlement, while the northern and eastern parts Øresund SE and the western and southern parts of Øresund DK have relatively low population density. The region thus consists of an urban area embracing the waters of Øresund and a more rural

⁸ Scandinavia: Sweden, Denmark and Norway. Nordic countries: Sweden, Denmark, Norway, Finland and Iceland.

⁹ OECD (2003) and The Newsletter Monday Morning (2004)

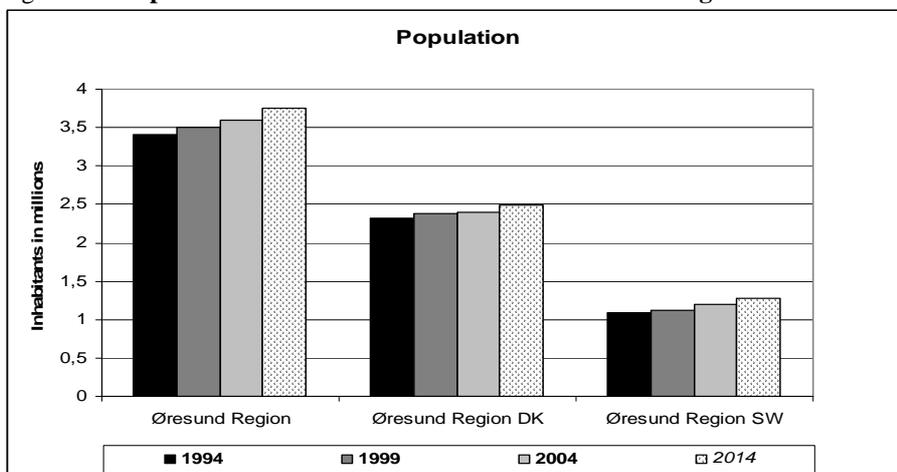
¹⁰ Source: www.orelog.org

part in the hinterlands. The Greater Copenhagen Area of 1.8 million people is one single labor and housing market. On the Swedish side, a further 700,000 people live in the urban areas Malmö-Lund-Landskrona-Helsingborg, making the urban parts of the Øresund Region home to 2.5 million people.

Population

The region is the most densely populated in Scandinavia. 3.6 million people live in the region and thus the population make up for nearly 27% of Denmark and Sweden’s total combined population¹¹. Sjælland and its surrounding islands on the Danish side make up for 2/3 of the region’s total population, Skåne on the Swedish side for 1/3¹². In the 1980’s and the beginning of the 1990’s the region experienced population decrease, but since the mid-1990’s, as can be seen in figure 1.3, there has been a large expansion in population. There are no indications of change in this trend. On the contrary, population is expected to increase in the Øresund Region in the coming years: with 150,000 people in the next ten years and another 150,000 between 2014- 2024¹³.

Figure 1.3: Population in the two countries and the Øresund Region



Source: Ørestat 2005 - Øresundsprognos. 2014 estimated 2005.

Demography in the region is similar to the ones of the nations. Only small changes are to be found and as expected in a capital region, Øresund DK has larger shares of people in the ages for 25-40 and smaller shares in the ages of 5-20 than the rest of Denmark. Skåne has a similar demography with a larger share of 20-30 year-olds and smaller share of 45-60 year-olds than the rest of Sweden¹⁴. Demography in the region is illustrated on an aggregated level in figure 1.4.

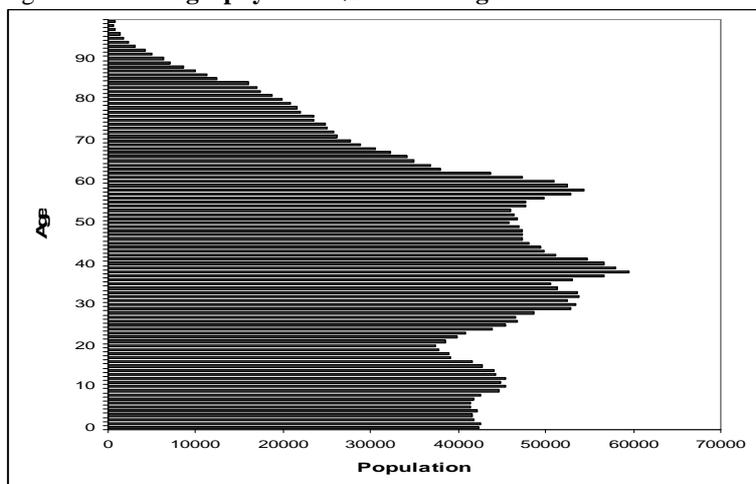
¹¹ According to Ørestat, the population was 3.598.410 by the end of 2004. Source: <http://www.orestat.scb.se>

¹² Statistics Denmark and Central Bureau of the Swedish National Statistics (SCB)

¹³ Statistics Denmark. On request by HUR and Region Skåne. Statistics for 2014 and 2024 are predictions by Statistics Denmark. The statistics holds some uncertainty as the region has a large young population and high mobility, which complicates predictions.

¹⁴ Øresundsprognos , Folkmängd 2004-2024

Figure 1.4: Demography in the Øresund Region



Source: Örestat, 2004.

Large shares of the region's population are students attaining a tertiary education. 4.2% of the population in Øresund SE and 3% of the population in Øresund DK.

Mobility

Mobility in the region is high, both within and to and from the region. Of the immigrants moving to Øresund DK, returning Danish citizens constitute the largest share, 43%¹⁵. The majority of the remaining 57% migrate from USA, Norway, Sweden and China. The number of Swedish citizens moving to Denmark has decreased considerably during the last decade¹⁶.

In Øresund SE, returning Swedish citizens constitute 23% of the immigration to Skåne, the remaining immigrants come from Denmark, Iraq, Bosnia and Germany where Danes, after the building of the fixed link in 2000, is the largest immigrant group.

In fact, the immigration of Danes to Skåne has since 2000 quadrupled. Young adults tend to be more mobile, and Øresund Region is no exception; young people, especially men, seem to be most willing to cross the Sound. This mobility is affected by the so-called Volvo-effect, which means lower cost of living in Sweden; especially in motor vehicles and housing. Although many within the region decide to move to where they work, many keep their residency and instead commute. Between Denmark and Sweden, commuting has increased since the year 2000, where about 2,000 people commuted on a daily basis, to today, where up to 10,000 travel across the Øresund to go to work each day¹⁷.

¹⁵ Öresundsprognos, Folkmängd 2004-2024. The majority of these returns from Great Britain, Sweden and USA.

¹⁶ Öresundsprognos, Folkmängd 2004-2024. The figure has decreased 24% between 1997-2004.

¹⁷ Gyllenkrok Cecilia, Øresund Network, interview. 6000-8000 commute 5 days a week, the other 2000 are commuters who cross the bridge for meetings etc only some days of the week, thus the total number of crossings by commuters is 10000 but the total numbers of commuters might be much larger.

1.4. Economic outlook

The Øresund Region is on the way of becoming a strong centre for economic growth and is showing a positive trend in growth in the coming years. As table 1.1 show, the GRP (Gross Regional Product) has increased notably in the last couple of years. Between 1995 and 2002 the GDP/capita experienced a strong annual increase and by the end of 2002 the GRP in the Øresund Region equalled 120 billion Euro.¹⁸ Growth in the GRP has increased continually and is expected to follow the trend in the years to come.

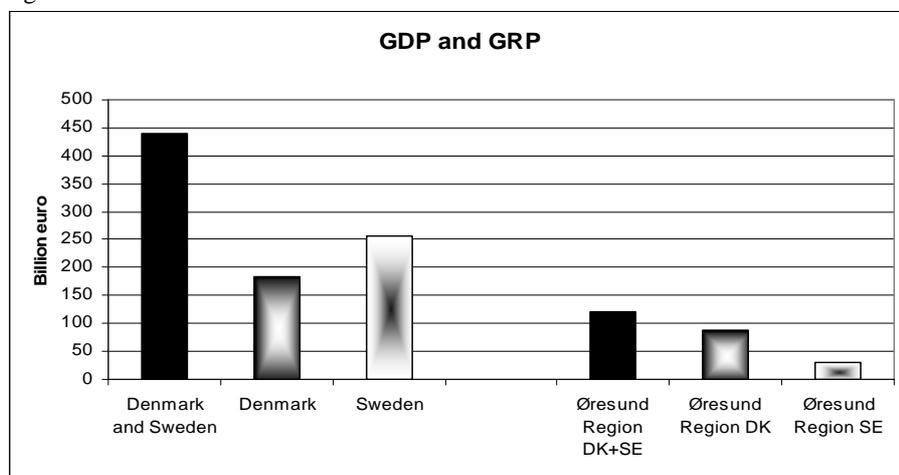
Table 1.1: **GRP/capita (in Euro) in the Øresund Region and Denmark and Sweden**

	1995	1998	2002
Øresund Region DK+SE	20 523	23 400	27 358
Øresund Region DK	22 068	25 200	29 148
Øresund Region SE	17 267	19 576	23 559
Denmark	19 941	23 045	27 021
Sweden	18 886	21 243	25 319

Source: Ørestat-current price 1995- 2002.

At a first glance at figure 1.5 it can seem striking that Øresund DK provides a large part of the Danish GDP, while Øresund SE provides a relatively smaller part of the Swedish GDP. This is however expected since the Øresund DK in many ways make up half of Denmark, both in terms of geography and population, while the Swedish part make up a much smaller share of the Swedish population and area. Furthermore Øresund DK includes the Danish capital, which naturally has a boosting effect on the economy.

Figure 1.5: **Gross Domestic Product 2002**



Øresund Region DK:
89 billion Euro
Øresund Region SE:
31 billion Euro

Øresund Region DK+SE:
120 billion Euro ≈ 33.000
Euro/capita

Source: SCB, DST. 2002-figures, based on our calculations, not purchasing parity adjusted

Source: Dst/Scb. For Danish statistics, 2002 is estimated. Real GDP.

The growth of productivity in the Øresund Region between 1995-2002 shows the same trends as in annual growth in per capita GDP. Productivity growth calculated as GDP/employed was 1,6% in 2002 with an annual increase in productivity of 1% during this time¹⁹.

¹⁸ Calculations based on statistics from SCB and Denmark's Statistics. In current prices - not ppp-adjusted.

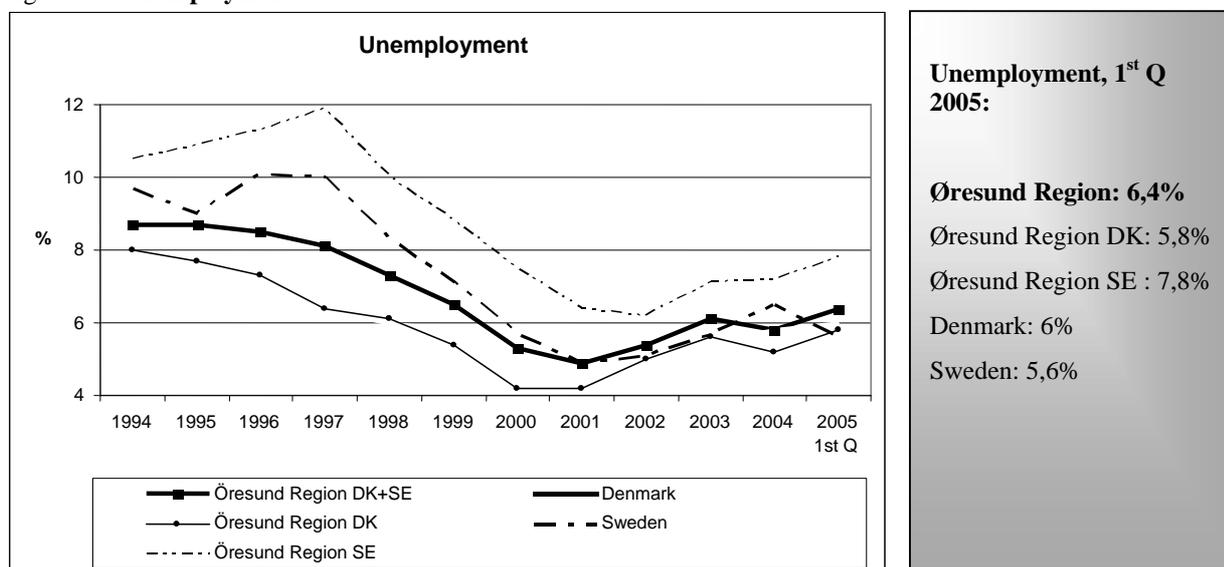
¹⁹ Ministry of Economic and Business Affairs (2005)

Unemployment

Unemployment in the Øresund Region follows the trend of each of the two countries. Between 1997- 2001 unemployment rates fell, nationally as well as regionally. Since 2001 unemployment seems to have increased, but the levels are still much lower than during the 1990's.

The region as a whole has a low unemployment rate of 6,4% of the total workforce. But if this figure is compared to national figures the picture is blurred. As figure 1.6. shows, the Øresund Region has a lower unemployment rate than Øresund SE, but have a rate higher than both Denmark and the Øresund DK. This is due to a number of facts that shows interesting geographic features of the two parts of the region. The heterogeneity derives from the central location of the Danish part whereas Øresund SE, a more peripheral area, for a much longer time have struggled with the issue of unemployment. Øresund DK has a unemployment rate of 5.8%, while the Øresund SE is a little higher reaching 7.8%.

Figure 1.6: Unemployment



Source: Ørestat. Please note: Age 16-64. Non-seasonally adjusted. All figures except 2005 are from 3rd quarter.

The employment growth in the region between 1995- 2002 was 1,1% annually. Compared to other cities such as Helsinki and Amsterdam, with employment growth rates of 2,5% and 2,4% respectively, the Øresund Region is not performing as well as it could have, taking the potential of the region into respect²⁰.

Denmark and Sweden – Scandinavian welfare states

The basic principle of the welfare systems in the two countries, often referred to as the Scandinavian welfare model, is that all citizens have equal rights to social security. Within the welfare systems, a number of services are available to citizens, greatly subsidized or free of charge. This means that for instance the health and educational systems are equal and available for everyone. The welfare model is subsidized by the state, and as a result, the two countries have two of the highest taxation levels in the world. In that regard it should be stated that wages are equally high in the two countries and that business taxation are among the lower in a European comparison.

²⁰ Ministry of Economic and Business Affairs (2003)

1.5. Regional policies

There is no single regional governing unit in the Øresund Region. Being a part of two countries, the region is administratively comprised of a single regional unit in Sweden, Region Skåne, and 8 regional units in Denmark. In Denmark, the Greater Copenhagen Authority is responsible for co-ordinating Øresund affairs and co-operates with Region Skåne on a large number of issues. Furthermore, the Øresund Committee brings local and regional politicians from the Øresund Region together working for a more integrated region²¹.

Both Denmark and Sweden have a three-layer system of government with administration on a national, regional and local level, although as explained further ahead, the regional responsibilities are divided differently between the countries' regions and municipalities.

Figure 1.7: Counties and municipalities in the Øresund Region



Øresund SE consists of Skåne, a county divided into 33 municipalities, which are all joined in the Region Skåne.

Øresund DK consists of eight political units: The city of Copenhagen, the city of Frederiksberg and the island of Bornholm as well as the five counties Copenhagen, Frederiksberg, Roskilde, West Zealand, Storstrøm. These five counties are furthermore divided into a number of municipalities.

From January 1, 2006, an administrative reform is introduced, and from January 1st, 2007 it is implemented

Source: www.nordregio.se

Danish Regional Policy

The degree of decentralization in Denmark is relatively high. In addition to the central state administration, Denmark is divided at a regional level into 13 counties (*amter*) plus the metropolitan areas of Copenhagen and Frederiksberg, and at a local level into 269 municipalities (*kommuner*). Major tasks handled by the county councils include health care, secondary schools, some public transport, regional planning and environmental control.

²¹ Source: <http://www.oresundskomiteen.dk>

In Øresund DK The Greater Copenhagen Authority (HUR), is responsible for co-ordinating Øresund issues²². HUR started up in July 2000 and is responsible for six main areas; public transport, regional and traffic planning, industrial policy, tourism, culture and Øresund co-ordination and development. The governing HUR Council is made up of regional politicians from the five local/regional authority units; the counties of Copenhagen, Frederiksberg and Roskilde and the cities of Copenhagen and Frederiksberg.

In Denmark, a structural reform will take effect January 1st 2007 after a one-year period of transition. The reform will among other things halve the number of municipalities in Denmark, abolish the counties and consequently form new larger regions with new responsibilities. As the structural reform abolishes the county structure, the existing counties will cease to exist and instead be joined into two *regions*. These two new larger regions, Capital Region and Region Sjælland, will make up the Danish part of the Øresund Region and have other responsibilities than the counties have today. Regional development will continue to be part of the regions' responsibilities, but the most significant change is the loss of authority of levying taxes that the then former counties have had. As new regions are formed in 2007, HUR will lose its coordinating role and stop existing. The reform will also give rise to the creation of regional growth centres²³, responsible for regional growth strategies. In the future, the growth centre in the Capital Region will most likely handle Øresund issues.

Swedish Regional Policy

In Sweden there are as in Denmark three democratically elected levels of government, all with their own powers and responsibilities: the Central Government, County Administration Boards and County Councils at regional level and municipalities at local level.

At a regional level, Sweden is divided into 21 counties (*län*), each of which has its own County Administration Board (*länsstyrelse*) and County Governor (*landshövding*). The County Administration Board is appointed by the Swedish government, and function as representatives of the state in their respective counties as well as links between the inhabitants, the municipal authorities, the Central Government, the Swedish Parliament and the central state authorities. Each county has a regional growth agreement designed to contribute to improved cooperation between regional and local bodies. Sweden has due to great dimension of regional disparities traditionally had a strong focus on regional policies and the goal of the regional growth agreements is to make the most of the particular conditions in each region. The most important role of the County Administration Boards is to ensure that the county develops for the benefit of the inhabitants, basing themselves on the authority vested in them by the Central Government and by the Swedish Parliament.

Also at the regional level, Sweden is divided into 21 County Councils (*landsting*) and Regions (*region*) with similar geographical areas as the counties. The County Councils' responsibility is generally health care and is run by elected politicians. Two regions in Sweden, Skåne Region and Västra Götaland are results of mergers of County Councils and the regions hold a special status. In Skåne, a new form of regional governance was developed in 1999 under the name "Region Skåne". In this experiment, tasks have been transferred from the appointed County Administration Board (*Länsstyrelse*) to the elected County Council/Region (*landsting/region*). Region Skåne acts as a co-ordinator in many important issues of regional development. Its work lies within the areas of trade and industry development, the environment, promotion of investment, town and infrastructure planning, public transport, culture and health.²⁴ The trial period of the self-governance was recently prolonged until 2010 with an evaluation in 2007.

²² Source: <http://www.hur.dk>

²³ In Danish: 'Vækstfora'.

²⁴ Source: <http://www.skane.se>

The regions have thus gained more self-governance in the last couple of years. The increased authority on a regional level adheres to the reform of the Swedish regional policy that is about to take place. Skåne and Västra Götaland are the first two regions that are trying the new structure, but more regions will most likely follow. The aim is to increase efficiency and to give a stronger democratic support to the municipalities, businesses, and organizations as well as to the society.

1.6. Øresund Region-building – visions and challenges

1.6.1. The creation of a new core and periphery

Some of the most positive result of the region building is the fact that the compression of space has created integrated spatial levels of e.g. the real estate market, the labor market and the educational fields. But this has to a large extent been done within the Copenhagen-Malmö-Lund axis. This axis encompasses the area of dynamic development and successful growth rates as mentioned above. In other words is the axis Copenhagen-Malmö-Lund is the new centre of Sjælland and Skåne. This has to some degree altered the earlier spatial distribution of power, flow of economic resources, goods, students, employees etc.

This is naturally a positive development for the businesses, people etc that live in the area the axis encompasses. But it could be seen as an obstacle in order to created balanced economic development if there is not distributed enough resources to other parts of the region. The old periphery of e.g. Southern parts of Øresund DK and the North Eastern part of Øresund SE could be further marginalized in terms of development, flow of knowledge and goods etc if there is not enough ‘spill over’-effect. The necessity of an economically strong core is clear, yet both sides of Øresund could benefit from a more even distribution of resources. In the years to come, creating positive spill-over effects for the more peripheral parts of the region will increase in importance.

1.6.2. A governance structure suited for a cross border region

It is complicated to say the least to create cross-border political structures. These structures have not yet been established in the Øresund Region. The Øresund committee underlines the problem in a statement to the two national governments:

”In the ongoing structural reform processes in Sweden and Denmark there is no real focus on the Øresund Cooperation. The economic development in the region with 3.5 million people is decisive for how Denmark and Sweden will be able to manage their growth objectives. The Øresund Committee has in a reply to a hearing by the Danish government powerfully emphasized that a continuous positive development requires an increasing responsibility from the politically elected from regional and local organisations in the entire Øresund Region. From business and trade, the university and research world, media and the general society the demands are increasing for an Øresund Region speaking with one voice, in order to stimulate frame conditions, legislation, daily integration and infrastructure. Divided responsibility conditions can only lead to fragmentation, ineffective and democratic deficit.”²⁵

The Øresund Region is then to some extent a political vacuum. One way or the other, structures have to be found for the region that are both capable of making valid political decision and having a democratic basis. These structures should encompass the three different levels of government: state, region and local.

1.6.3. More compatibility needed

Two well-organized nation states meet in the Øresund Region. Denmark and Sweden have very similar welfare systems, taxation, laws etc. But they differ, of course, in a large number of cases. The region then needs more compatibility between the two state systems. It could be taxation, it could be innovation systems, research

²⁵ Øresund Committee (2004)

money etc, but also priorities, more of joint decision-making etc. The important thing is that the systems of the Øresund Region should not be harmonized; rather the region should take advantage of having two well-organised systems side by side. The energy and dynamism in the region stem from the heterogeneity, not from the similarities.

A number of big (often formerly state) companies like telecommunications, postal services, railways are organised according to the nation state principle. They also need to develop corresponding structures in order to make cross-border contacts easier.

1.6.4. Cheaper transportation across Øresund

It is expensive to cross the Øresund Bridge both by car and train. The tariffs should be lowered in order to harvest the most optimal results of the bridge. As a general rule, there are no toll roads in neither Denmark nor Sweden, why it seems irrational to charge traffic across a bridge that was built to create a region.

CHAPTER II: CHARACTERISTICS OF THE HIGHER EDUCATION SYSTEM

Main findings in this chapter:

- 150.000 enrolled students in 14 universities across the region.
- The region is home to both “one-of-a-kind” specialised institutions and large, multifaculty HEIs, attracting students and researchers nationally as well as internationally.
- HEIs have a positive impact on minority related problems – engaged in widening participation among ethnic groups and social classes
- Øresund University, a cross-border cooperation between 14 HEIs, brings together researchers and students across the border and collaborates with industry, government society.
- HEIs are *ports of knowledge* – places where global flows of researchers and students, ideas and innovations meet the Øresund Region.
- Two different countries and two different systems is a challenge to be dealt with – the Bologna model is only introduced in the Danish system of higher education.
- There is a need to lower the transportation costs across Øresund for students.
- Further internationalization could provide more students and researchers around the world with knowledge of the Øresund Region and attract them to study and research.

2.1. Introduction

In this chapter, we will first give an overview of the national systems of higher education found in Denmark and Sweden. Then, the focus will turn to the HEIs in the Øresund Region providing basic facts about the sector. Next, the chapter turns to Øresund University, the regional organization for university collaboration. The chapter concludes with a discussion of visions and challenges for the HEIs in the Øresund Region.

2.2. Overview of the national systems of higher education in Sweden and Denmark

In this section, the purpose is to provide the reader with basic facts about the national systems of education. Please notice that readers who already possess knowledge of the two systems can skip this part of the chapter.

2.2.1. The Swedish system of higher education

Institutions of higher education (apart from a few private institutions, none of which lie in the Øresund Region) in Sweden are formally government agencies, answering to the Ministry of Education and Culture²⁶. The purposes of the HEIs are, according to the Swedish Higher Education Act:

“The state shall, as the entity responsible, provide institutions of higher education for education based on science or art and on tested experience, and research and artistic development and other development. The institutions of higher education shall also co-operate with the surrounding community and give information about their activities (Law 1996:1392)”²⁷.

The Swedish system for higher education is a unitary system. The system comprises both universities and university colleges. The so-called Bologna structure of tertiary education has not yet been implemented in

²⁶ With the exemption of the Swedish University of Agricultural Sciences, which answers to the Ministry of Agriculture

²⁷ Chapter one in the Swedish Higher Education Act. An English version of the Swedish Higher Education Act is available from the web site of the National Agency for Higher Education:

http://www.eng.hsv.se/en/CollectionServlet?view=0&page_id=446&expand_tree=134

Sweden. However, in a Government bill from 2005²⁸, a three-cycle system is proposed in line with the goals of the Bologna process. According to the OECD ISCED (International standard classification of education)²⁹ there are the following types of education in Sweden:

Table 2.1: OECD ISCED classification showing types of educations in Sweden

ISCED 5A	
First	Diploma (2-4 yr); Bachelors degree (3yr) Masters Degree (4yr); Bachelor's degree in pharmacy/ horticulture/ forestry/ medicine/ psychology/ dentistry/ veterinary medicine (5-5½yr)
Second	Nursing specialisation qualification (1-1.25 yr); Midwifery/ Psychotherapy/ Special education (1½ yr)
ISCED 5B	
First	Diploma in Engineering (lower level, 2 yr); Diploma in dance and the arts (2 yr); Degree certificate in advanced vocational education (2-3 yr)
Second	
ISCED 6	
	“Licentiate” (2 yr); “Doctorate” (4 yr, including “licentiate”)

Source: *Education at a glance, OECD 2004*

Universities, university colleges and other institutions of higher education provide higher education in Sweden. In total, there are 39 state institutions of higher education (14 universities, 22 university colleges and 3 other institutions) in Sweden, and in addition there are 22 private institutions, partly financed by the state. The main difference between universities and university colleges in Sweden is that universities are allowed to confer doctoral degrees. Some university colleges have, however, been allowed to award doctoral degrees within a specific research area.

Furthermore, a parallel system of advanced vocational training institutions exists. This is a system of post-secondary education³⁰.

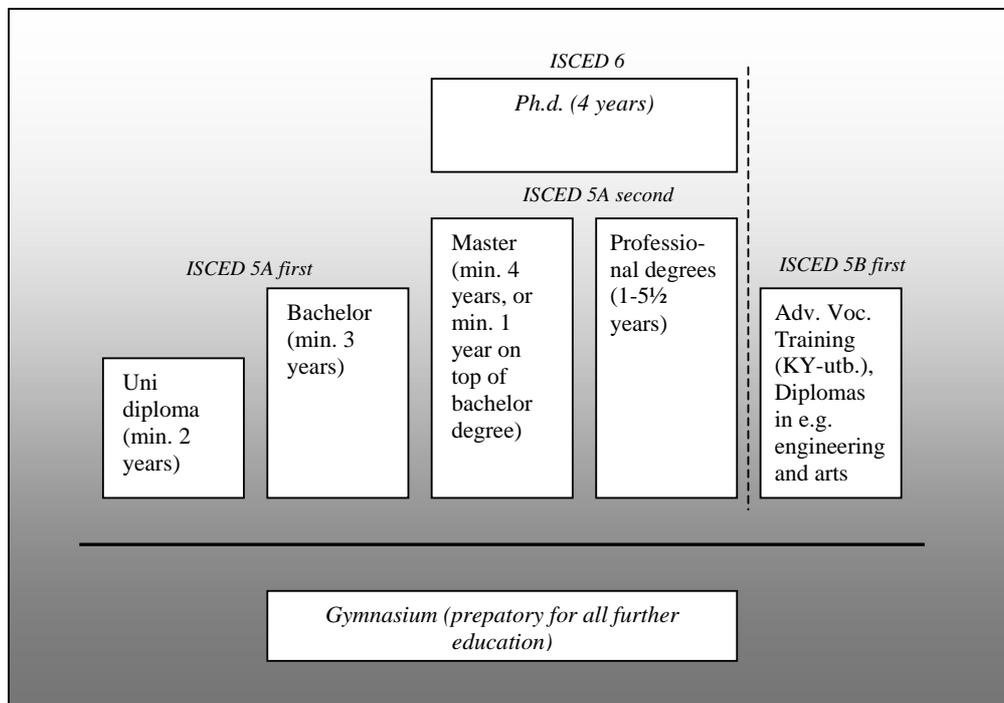
²⁸ Ministry of Education (2004)

²⁹ **ISCED 5A** programmes are largely theory-based and are designed to provide sufficient qualifications for entry to advanced research programmes and professions with high skill requirements, such as medicine, dentistry or architecture. Tertiary-type A programmes have a minimum cumulative theoretical duration (at tertiary level) of three years' full-time equivalent, although they typically last four or more years. These programmes are not exclusively offered at universities. Conversely, not all programmes nationally recognized as university programmes fulfill the criteria to be classified as tertiary-type A.

ISCED 5B programmes are typically shorter than those of ISCED 5A and focus on practical, technical or occupational skills for direct entry into the labor market, although some theoretical foundations may be covered in the respective programmes. They have a minimum duration of two years full-time equivalent at the tertiary level. **ISCED 6** programmes lead to the award of an advanced research qualification. The programmes are devoted to advanced study and original research. They require the submission of a thesis or dissertation of publishable quality that is the product of original research and represents a significant contribution to knowledge. They are not solely based on course-work and prepare recipients for faculty posts in institutions offering ISCED 5A programmes, as well as research posts in government and industry. Source: OECD (2004a).

In the graphic model below an overview of the Swedish system of education is given in relation to the ISCED classification system.

Figure 2.1: **Overview of the Swedish educational system**



In the following, we will only deal with public HEIs (universities and university colleges), the reason for this being that no private institutions exist in the Swedish part of the Øresund Region and that the advanced vocational training system is post-secondary rather than tertiary. In Øresund Region SE, there is one university and two university colleges. Furthermore, the Swedish University of Agricultural Sciences has a branch in Skåne. These four institutions are all members of the Øresund University. More details about the four institutions are provided below in the section on *Øresund University*.

2.2.2. *Formal requirements on cooperation with the surrounding society*

In Sweden, the duty for the HEIs to collaborate with society was introduced in 1977, when the HEIs became obliged to inform about their research, and further elaborated with a 1996 amendment to the Higher Education Act of 1992 that required the HEIs to both inform about their activities and engage in cooperation with the surrounding society:

³⁰ In Swedish: KY-Utbildningar. One third of the education time is spent in the advanced application of theoretical knowledge at a workplace. The total time of education can vary from 1 to 3 years. The Advanced vocational training system started in 1996 as a pilot project and was made permanent in 2002. The purpose of the system is to upgrade the knowledge and skills of the labor force in order to make the labor market more flexible and to increase employment. In Skåne, KY is found in 17 different cities. For more information on the advanced vocational system, we refer you to the web site <http://www.ky.se>.

“The institutions of higher education shall also co-operate with the surrounding community and give information about their activities” (Law 1996:1392)

For some years this obligation was referred to as a “third role” for the HEIs, but the HEIs are increasingly seeing this obligation as an integral part of their activities. In a number of recent publications³¹ the effort of the Swedish HEIs on this aspect is evaluated, and the findings are generally positive. The intention of the law is thus carried out well by a large number of HEIs. The innovation parks in Southern Sweden are used as a good example of joint ventures with a successful output and good cooperation between the different actors in the region. This report returns to the innovation system in Chapter 4.

2.2.3. Swedish university governance and funding

The Swedish HEIs enjoy a large degree of autonomy. A board, where a majority of the members are external to the institutions, governs the HEIs. The Swedish government appoints the majority of the members of the board and the chairman, and it also appoints the vice-chancellor. Both students and teachers hold seats on the board, whereas labor union representatives can partake in the meetings but not vote³².

In Sweden, higher education (except doctoral studies) is funded separately from research (including doctoral studies). Funds for higher education are dependent on the number of students and their study results. Funds for research, including doctoral studies, are not performance related. Government funds for research are allocated to each university and are allotted to different areas of research. In addition to this, resources for research also come from other sources. Many foundations, research councils as well as the European Union and others contribute on a large scale to the financing of the research at the HEIs. This means that often government funding only constitutes a small part of the research budgets of the universities.

In 2003 the Swedish state spent 4,788 million Euros on tertiary education. This amounts to 1.8 % of the country’s gross domestic product. This is close to what has been spent in previous years. In a wider perspective the share of GDP spent on tertiary education has grown slightly. In the beginning of the 1990’s the share was close to 1.5%. The annual turnover for the Swedish HEIs in the Øresund Region as a whole was in 2004 approximately 694.1 million Euro.³³

We will later on in this chapter compare the expenditures of the Swedish and Danish tertiary education systems to those in other OECD countries.

2.2.4. The Danish system of higher education

Higher education in Denmark is subject to national governance. Thus, it is the state that is responsible for the HEIs in Denmark.

In Denmark, the Bologna-system has been almost fully implemented. Thus, students study for three years for a Bachelor’s Degree, two more years for a Master’s Degree and finally three years on top of that for a PhD-degree. It is possible to start on a Ph.D already after four years of university studies, in which case the PhD is prolonged with one year. According to the OECD ISCED classification the following types are found in Denmark:

³¹ Högskoleverket (National Agency for Higher Education) (2004a)

³² Chapter two in the Swedish Higher Education Act.

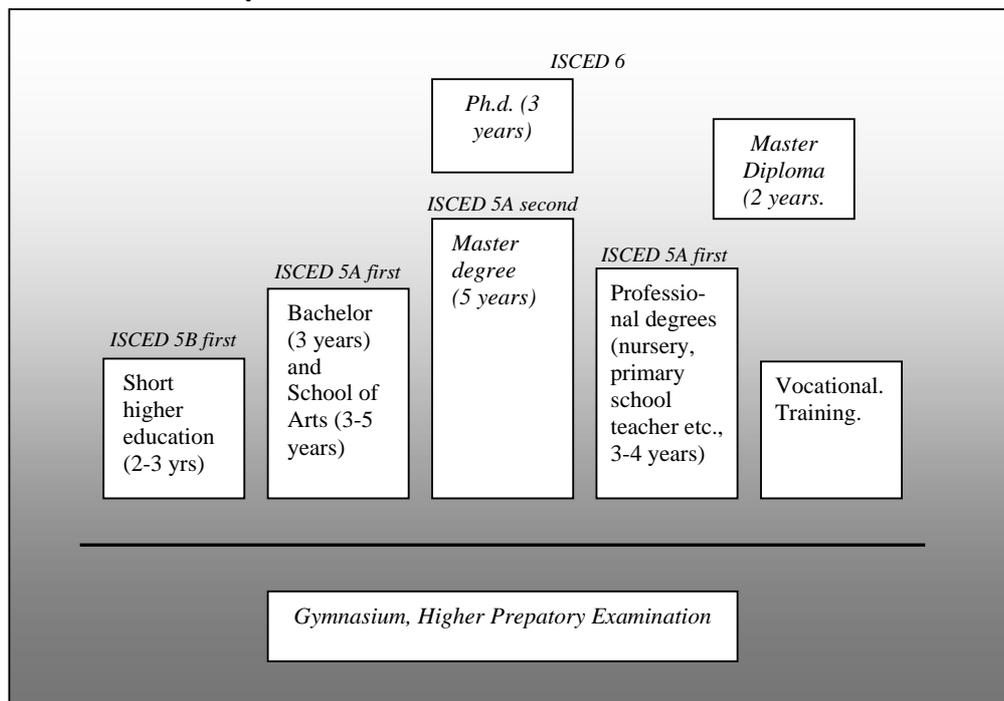
Table 2.2: OECD ISCED classification showing types of education in Denmark

ISCED 5A	
First	Tertiary education medium cycle: Diploma engineer, nursery, primary school teacher etc. (3-5 yr), bachelor's degree (3 yr)
Second	Tertiary education long cycle: Cand. Mag., Cand. Scient., Cand. Polyt., etc. (2 yr), long educations within music and the fine arts (5-7 yr)
ISCED 5B	
First	Tertiary education short cycle, within e.g. computer science, construction, machinery (2-3 yr)
Second	
ISCED 6	Doctoral programmes (Ph.D., 3 yr); Doctorate (5-10 yr)

Source: Education at a glance, OECD 2004

In the graphic model below an overview of the Danish system of education is given, both in terms of ordinary education, supplementary education and adult education. The picture here is a bit more complicated compared to the Swedish system. Especially the number of supplementary training options is high.

Figure 2.2: Overview of the Danish system of education



According to the Danish University Act of 1993, the purposes of the universities are to conduct research and provide tertiary education to the highest academic standards and disseminate information about scientific methods and research results. With the University Act of 2003, which replaced the 1993 Act and its

amendments, these purposes were kept, but the obligation to disseminate information was emphasised. The 2003 Act thus requires the universities to exchange knowledge and competencies with the society, including the business sector; to engage in public debate and to ensure research relations with other tertiary education institutions³⁴.

The Danish HEI sector is divided between three different ministries. The Ministry for Science, Technology and Innovation is responsible for higher education at the universities; the Ministry of Culture is responsible for higher education institutions within the area of fine and performing arts, and the Ministry of Education is responsible for short and medium-long higher education. The tertiary education system in Denmark is thus divided into three categories according to the type and the length of the education, they provide:

1) Universities

In Denmark, there are 12 research-based universities. The university sector is the responsibility of the Ministry of Science, Technology and Innovation. Universities provide long (3 years+) tertiary, research-based educations. A university education leads to a Bachelor's (3 years of study), Master's (3+2 years of study) or PhD (3+2+3 years of study) degree.

The eight universities in the Danish part of the Øresund Region are all but two located in Copenhagen. The remaining two, Roskilde University and the Technical University of Denmark, are located outside of Copenhagen but still within the Greater Copenhagen Area. Thus, all the universities are located within the urban part of the Øresund Region.

2) University colleges

University colleges provide short (1-2 years) and/or medium long (up to 4 years) tertiary educations and are regulated by the Ministry of Education. In the Danish part of the Øresund Region there are 71 of these university colleges offering vocational training. For instance, teachers and nurses are educated at university colleges in Denmark.

Some of the university colleges are joined in Centres for Higher Education (the Danish acronym is CVU). These centres would typically offer several different educations. In the Øresund Region, the Centres for Higher Education are spread out throughout the region, and most of the towns outside the Greater Copenhagen Area have one or more university college, depending on size. The university college-system and the Centres for Higher Education are the only HEIs in the rural part of the Øresund Region.

3) Schools of Art

The Ministry of Culture is responsible for Denmark's 18 schools of Fine Arts and Culture. Of these, 11 institutions are located in Copenhagen. These schools are all HEIs covering schools of architecture and design, music conservatories, visual and performing arts and film as well as conservation and librarianship. These institutions all aim to teach to the highest levels within their disciplines.

The art schools teach on a scientific as well as an artistic basis to enable their graduates to practise their professions with a combination of academic and artistic qualifications. The institutions combine teaching and research with artistic and performing activities in different ways, according to their professions. Furthermore, they disseminate knowledge and talents through public concerts, counselling, exhibitions as well as the publication of scientific articles, books etc. In total, these institutions play a pivotal role in the academic and cultural life in Denmark.

³⁴ The University Act of 2003 is available in English translation from the Ministry of Science, Technology and Innovation's web page: <http://www.vtu.dk/fsk/div/unisoejlen/ActofUniversities2003.pdf>

The schools of Fine Arts and Culture enjoy a large degree of autonomy in their pursuit of overall goals and in the cultivation of a free-spirited and creative environment. It is a testimony to the qualities of these schools that student applications far outnumber places available. Furthermore, a significant section of the students come from other countries - the single most dominant group being Swedish students.

In total, there are 89 institutions offering tertiary education in the Danish part of the Øresund Region (8 universities, 71 university colleges and 10 schools of the Fine and Performing Arts). This self-evaluation report will, however, focus on the 10 Danish universities and schools of art that participate in Øresund University.

2.2.5. Formal requirements on regional engagement

The University Act of 2003 requires the universities to exchange knowledge and competencies with the society, including the business sector; to engage in public debate and to ensure research relations with other tertiary educations.

Quoting §2, 3 of the 2003 University Act:

“The university shall collaborate with society and to the development of international collaboration. The university’s scientific and educational findings should contribute to the further growth, welfare and development of society. As a central knowledge-based body and cultural repository, the university shall exchange knowledge and competencies with society and encourage its employees to take part in the public debate”

The universities in Denmark have – like the Swedish ones – engaged with regional actors in creating and furthering regional development. In Øresund DK, the HEIs have engaged in regional development in the Øresund Region. The good examples are Øresund University and Øresund Science Region, two bi-national, cross-border collaborations with universities and regional actors from both Sweden and Denmark. Later in this chapter, we will have a look on Øresund University, and in Chapter 4 Øresund Science Region will be investigated.

2.2.6. Danish university governance and funding

The Danish government regulates the university sector, but the Danish universities still enjoy a large degree of autonomy. All Danish universities are governed by a board, where a majority of the members are external to the university. The chairman is found among the external members, but the board decides itself whom to choose. The board hires the vice-chancellor, who then hires the deans etc. The universities have – with the 2003 Act – acquired the status of *self-governing institutions*.

Danish universities are funded through several channels. First of all, the universities receive a basic grant for the running costs. Second, there is an activity-based income, where student activity (counted in one year of full-time study) results in government grants. Third, there is a national system of research funds that all universities in the country can apply for. Fourth, the possibility of external funding (from the European Union, national, regional or local authorities or businesses) exists. Finally, research can be funded through public-private-partnerships.

In 2002 the Danish state spent 3,943 million Euros on tertiary education. This amounts to 1.8% of the gross domestic product.

2.3. Differences between the Danish and the Swedish system

A fundamental difference between the two countries' systems of higher education is that the Swedish universities offer a larger variety of programmes than the Danish. Lund University, for instance, educates nurses, opera singers and traffic air pilots as well as more traditional academics. In Denmark, the university colleges and the Centres for Higher Education would offer programmes like these. Another main difference between the Danish and the Swedish system of higher education are the fault lines between the different types of institutions. In Denmark, there are three very distinct types of institutions (universities, university colleges and schools of art) offering different kinds of education and governed by different regulations, whereas Sweden maintains a unitary system for all types of higher education.

Further, the abundance of specialised universities in Øresund DK makes the educational possibilities on the Danish side of Øresund much more specialised than in the Swedish part. This is partly because of the “capital city-effect”; Copenhagen has on the Øresund Region. In Sweden a similar pattern to some degree would be found in and around Stockholm. Yet there are still differences between the Swedish and Danish way of organising and regulating higher education.

Regional considerations have played a role when establishing new HEIs in Øresund SE. This is also the case in Denmark, but with the capital situated in the region, regional considerations have led to the establishing of HEIs outside the Danish part of the Øresund Region. When including the university colleges and Centres for Higher Education in Denmark the picture becomes less clear, though.

Both Danish and Swedish HEIs are required to collaborate with society, disseminate information etc, but the term “society” is not further elaborated on. This then means that the universities themselves can choose what to consider “society”. One difference is that the Swedish universities are expected to be among the driving forces for regional development to a greater extent than the Danish HEIs. The differences should not be exaggerated and are most probably results of the different geography of the two countries: Denmark is a small, densely populated country whereas Sweden is larger and less densely populated. HEIs in both Denmark and Sweden are thus regional, national and international actors.

2.4. International comparison

How well do the universities in the region perform related to both other universities in Denmark and Sweden, as well in an international comparison? The Øresund Region is among the five top regions in Europe as regards production of scientific papers, find Matthiesen et al (2005):

Table 2.3. **Largest European research centres.** Number in bracket indicates ranking internationally.

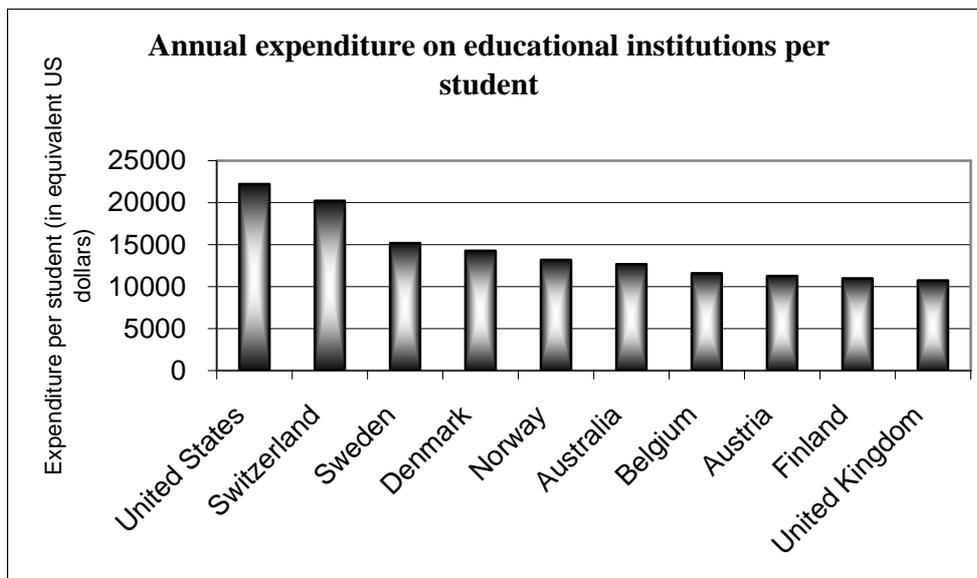
Ranking,	Number of publications	Research centre
2002-2004		
1	73,403	London (2)
2	53,003	Paris (5)
3	44,094	Amsterdam-Hague-Rotterdam-Utrecht (9)
4	41,001	Moscow (11)
5	29,002	Copenhagen-Lund (15)

Source: Matthiesen et al (2005)

The ranking is a bibliometric analysis based on the Science Citation Index, covering publications within the fields of engineering, science and medicine in the years 2002-2004. It should be noted that rankings like this one only provides an image of the number of articles, not necessarily how influential and cited they are.

Denmark and Sweden are also among the countries that spend most on tertiary education. In an OECD report³⁵ from 2004 different figures show to what extent countries on a global level spent on education in the beginning of the new millennium.

Figure 2.3: Annual expenditure on educational institutions per students in 2001

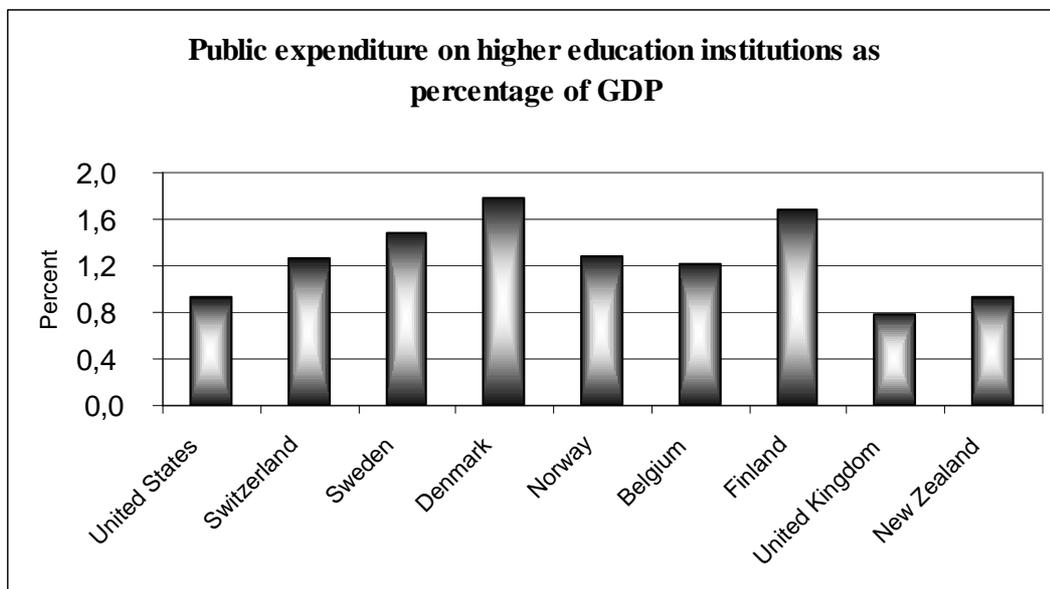


Source: *Education at a glance, OECD 2004*

Both Denmark and Sweden are ranked as top countries, when taking a glance at public expenditure to tertiary education as a percentage of GDP. The OECD country mean is 1.40 and both Denmark and Sweden were well above that figure. See the table below for a complete picture of the two countries ranking compared to the rest of the OECD countries.

³⁵ OECD (2004)

Figure 2.4: Public expenditure on tertiary education as percentage of GDP, 2001



Source: Education at a glance, OECD 2004

2.5. Overview of HEIs in the Øresund Region

In the Øresund Region, there is a fine web of institutions offering tertiary education. The educational services offered differ in length, character and purpose, and they are owned and thus governed by different authorities. It should – again – be emphasized that the government in both countries regulates the higher education sector, and there are thus no regional organizations with responsibility – neither financially nor strategically – over the sector.

Table 2.4: The HEIs in the Øresund University. Listed by founding year.

HEI (country) (Abbreviation)	Founded	Faculties/Areas	Annual turnover (from annual reports 2004)	Number of students/ /Ph.D.students/ staff
University of Copenhagen (Denmark) (KU)	1479	Law, Health Sciences, Humanities, Natural Sciences, Social Sciences and Theology.	3,991.8 million DKK (536.5 million Euro)	35700/3405/6700
Lund University (Sweden) (LU)	1666	Technology, Science, Law, Social Science, Medicine, Performing Arts, Business, Humanities and Theology.	5,043 million SEK (552.5 million Euro)	41000/3047/6006
Technical University of	1829	Engineering, Technology	1,520.3 million DKK	5794/600/2150

Denmark (Denmark) (DTU)			(204.4 million Euro)	
The Royal Veterinary and Agricultural University of Denmark (Denmark) (KVL)	1858	Veterinary Studies, Agricultural Studies, Biology and Biotechnology, Food Science, Landscape Architecture, Natural Resources and Agricultural Economics.	1,169 million DKK (157.1 million Euro)	3500/450/1600
The Danish University of Pharmaceutical Sciences (Denmark) (DFU)	1892	Pharmaceutical Studies, Industrial Drug Development.	260.8 million DKK (35.1 million Euro)	1200/140/350
University of Kristianstad (Sweden) (HKr)	1912	Natural sciences, Social Sciences, Humanities, Educational Studies.	378 million SEK (41.4 million Euro)	11179/0/495
Copenhagen Business School (Denmark) (CBS)	1917	Economics and Business Administration, Language, Communication and Cultural Studies.	745.3 million DKK (100.2 million Euro)	11647/178/878
Royal School of Library and Information Science (Denmark) (DB)	1956	Library and Information Science Studies.	90 million DKK (12,1 million Euro)	840/13/130 ³⁶
Roskilde University (Denmark) (RUC)	1972	Natural sciences, Social Sciences, Communication, Journalism and Cultural Studies, Humanities.	577 million DKK (77.6 million Euro)	9360/232/463
Malmö University (Sweden) (Mah)	1998	Natural sciences, Social Sciences, Humanities, Educational Studies, Dentistry.	914 million SEK (100 million Euro)	21000/206/1100
IT University of Copenhagen (Denmark) (ITU)	1999	IT Studies, Software development, Multimedia Technology.	149 million DKK (20 million Euro)	1347/35/220
The Danish University of Education (Denmark) (DPU)	2000	Educational Sociology, Philosophy of Education, Educational Psychology, Educational Anthropology, Curriculum Research, Learning Lab Denmark.	292 million DKK (39.3 million Euro)	4093/93/363

³⁶ The student figure includes students at the branch in Aalborg in the northwestern part of Denmark.

Swedish University of Agricultural Sciences – Alnarp branch (Sweden) (SLU)	1862	Agricultural Studies, Biology and Biotechnology.	2,200 million SEK (240 million Euro. Includes all of SLU, not just Alnarp branch)	3340/830/3200 (includes all of SLU, not just Alnarp branch)
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Summed up all of the region’s HEIs participating in the Øresund University have an annual turnover of 14,018 billion DKK or 17,500 billion SEK (1,884 billion Euro)- divided between 694 million spent on the Swedish HEIs and 1,202 million spent on the Danish side³⁷.

In the table below the schools of fine and performing art in the region are listed. Those marked with a ‘*’ are members of the Øresund University.

Table 2.5: **Overview of the schools of fine and performing arts in the Øresund Region.**

School of art (country)	Founded	Areas
Royal School of Library and Information Science (*)	1956	Library and information studies
The Danish School of Design	1875	Design studies
The National Film School of Denmark	1966	Film studies
The Royal Danish Academy of Music	1867	Composing, directing and playing music (classical)
The Glass and Ceramic School on Bornholm	1997	Qualifies artist craftsmen in the field of glass or ceramics
The Royal Academy of Fine Arts – School of Architecture (*)	1754	Architecture
The Royal Academy of Fine Arts – School of Visual Art	1754	Visual arts
The Royal Academy of Fine Arts – School of Conservation	1754	Conservation
Rythmic Music Conservatory	1986	Composing, directing and playing music (modern)
The Danish National School of Theatre	1968	Drama and dancing

* = Member of the Øresund University.

Corresponding schools for art, music and drama are found on the Swedish side but are integrated into Lund University.

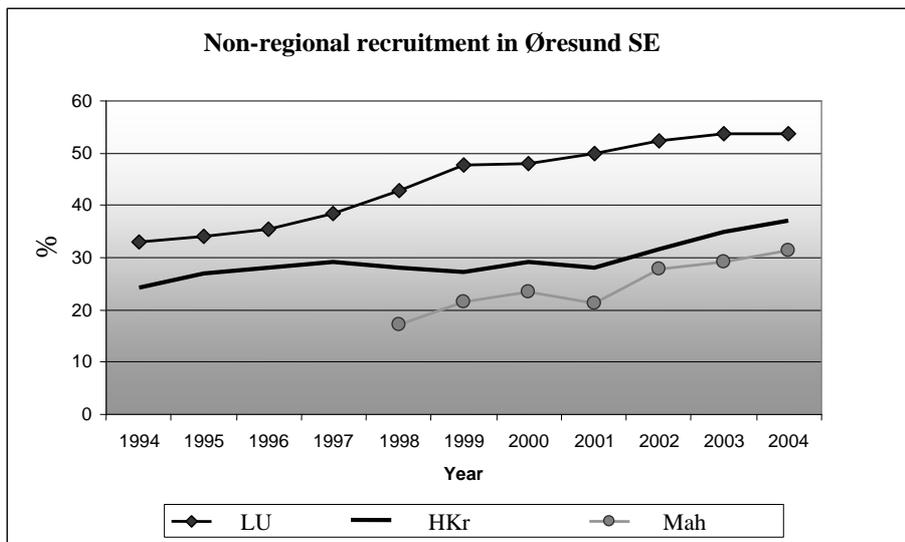
In addition there is a total number of 71 university colleges in Øresund DK.

³⁷ Swedish University of Agricultural sciences, Alnarp branch is not a part of this calculation due to lack of precise figures.

2.6. Recruitment of students

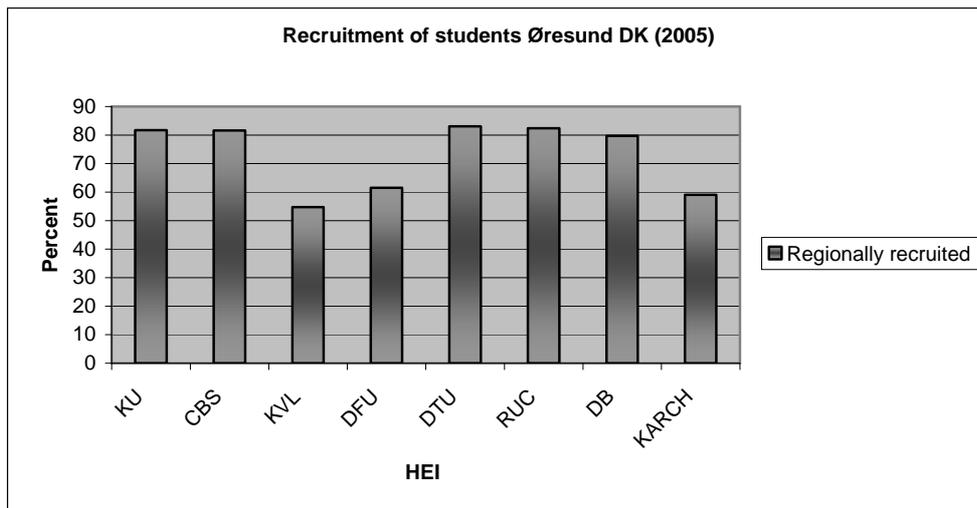
Although the HEIs have a national educational focus, the HEIs in the region attract a large share of the students regionally. However, this picture has slightly changed during the last couple of years. As figure 2.5 shows, many of the students at HEIs in Skåne are still recruited regionally, but the number has steadily been decreasing over the last 10 years. LU recruits a large share of their students outside the region (53,7% in 2004). Mah, which started out with more than 80% of the new students recruited regionally, now has a percentage of 69,7% recruited from within the region. Hkr recruits 37,2% of their students from outside the region.

Figure 2.5: Non-regional recruitment in Øresund SE



Source: Data from <http://nu.hsv.se/nu/regional/analys.jsp> July 4, 2005. First-year students

Figure 2.6: Regional recruitment of students in Øresund DK, 2005



Source: Tilmeldingssekretariatet, den Koordinerede Tilmelding.

Also the Danish HEIs in the region recruit a considerable part of their students from within the region, as figure 2.6. shows. However, it should be noted that the figure shows where the students lived when applying for acceptance to the HEI and not from where they originate. As young Danes generally do not start tertiary education right after their secondary education, many can have moved from other parts of the country to Copenhagen before applying for acceptance.

Broadly, when it comes to recruitment, the Danish HEIs are divided into two groups; those who mainly recruit from the region, and those who recruit students throughout the country. In the first group, KU, CBS, DTU, RUC, ITU. Among these, RUC recruits almost completely within the Greater Copenhagen Area, where 85% of the students originate. The second group is an effect of national monopolies that some of the Danish HEIs hold (DFU, KARCH, KVL etc), which results in students moving in order to obtain the certain education that they are interested in.

The interest in obtaining a higher education has dramatically increased during the last decade. Following this increase, the HEIs in Sweden and Denmark as well as in the region have expanded. The student recruitment illustrates this increase; between 1993 and 2002 the student enrollment at universities in the Swedish part of the Øresund Region, Skåne, increased with no less than 53.6%, which is above the national increase of 51.1%³⁸. The expansion of the Swedish universities has affected the number of graduates greatly. In the past decade the numbers of degrees increased with nearly 50%, an annual increase of 4%. In addition to students with degrees, the labor market absorbs skilled students who have a higher education but are without a degree³⁹. Between 1998/99 and 2003/04 the number of BAs in Sweden increased from nearly 8,000 to 12,500 and the number of Master degrees increased from nearly 7,000 to 10,300⁴⁰. The number of Ph.D's awarded were doubled during this period of time⁴¹.

One of the educational goals the Swedish Ministry of Education has set is to recruit 50% of all students from secondary school to a tertiary education before the age of 25. Skåne almost reaches this goal with a transition percentage of 48.1%. There are however large differences within Skåne. The social structure of the communities and the parents' educational level are some factors that influence the transition percentage; others are access to higher education as well as access to the regional labor market. The city of Malmö, formerly an industrial city, has despite the increased interest for higher education still a relatively low transition percentage. The city of Lund, on the other hand, known for its academia, is the city in Sweden with the highest transition percentage: 82.7 % of their female high-school students continue to attain tertiary education⁴².

Women are the majority at the HEIs in Skåne, just as in Sweden in general. At LU, female students comprise 54% of the total student population, at Mah the figure is 67% and at HKR 72%. In Denmark, women have since 1998 comprised a majority of students at the longer higher educations offered⁴³.

In Denmark, the total student population at the universities⁴⁴ has increased from 90,000 in 1993 to 105,000 in 2003. Most of this growth has taken place within the areas of Humanities and the Social Sciences, whereas the

³⁸ Westlund Hans p.17. The newer, less established universities had the highest increases, on average 103,4% Compared to those, the increase at Lund University is moderate.

³⁹ Högskoleverket (National Agency for Higher Education) (2004b)

⁴⁰ Högskoleverket (2004b)

⁴¹ Högskoleverket (2004c)

⁴² Male students in Lund 68,8%. Male +female students: 75%. Swedish average 18% (measuring one year after high-school graduation)

⁴³ <http://pub.uvm.dk/2004/kryds/kap06.html> (14-05-2005)

Technical and Natural Sciences experienced a downturn during the period, but in 2002 the 1993-level was restored. Particular one topic has experienced a huge increase in student numbers: Media and Mass Communication⁴⁵. During the same period, the number of employed university graduates increased with 51%⁴⁶.

2.6.1. Widening participation

Sweden has for some years pursued an active policy to include groups not previously pursuing higher education. In the regional learning system it has been implemented via the establishment of out-reach campuses, regional centres of learning and career centres at the universities. Because Sweden is thinly populated, one action has been to bring the university to the prospective students. This has also been the case in Denmark, but not to the same extent. Today, several of the HEIs in Øresund SE have university branches (for instance Lund University's Campus Helsingborg) and the HEIs have contributed establishing learning and study centres throughout Skåne⁴⁷.

In Denmark, this is not the case, largely because the division of labor between the universities (offering long, tertiary educations) and the university colleges (offering short and medium-long tertiary educations). In Øresund DK, the universities are thus centred on Copenhagen, leaving the university colleges with the responsibility to bridge the geographical barriers to education. It should be noted here that the distances in Øresund DK are very modest – from Copenhagen to the southern part of the region the maximum journey time is two hours – and that the universities are obliged to enter into partnerships with the university colleges to transfer knowledge.

All four HEIs in the Swedish part of the Øresund region have strategies for widening participating, i.e. recruiting students from groups underrepresented at university to studies at the university. At LU that strategy includes improved information about the contents and structure of the programmes and courses offered as well as special attention the guidance and counselling during the first year of university to help the transition to student life. In a proposition by LU, the vice-chancellor noted that the work the HEIs do to widen participation to a large extent is based on other educational forms being developed, i.e. the educational institutions that prepare students for tertiary education. Co-operation between secondary schools, adult education institutions and other educational providers are crucial in the work that the HEIs do⁴⁸.

Although the HEIs in Øresund SE all work with widening participation, they all have different starting points as the social structure of the cities are very varied, and thus the results of the widened participation vary. The regional disparities in Øresund SE are made visible when studying the recruitment of students with working class background as well as recruitment of students with foreign background, shown in figures 2.7 and 2.8 below.

⁴⁴ Please note that some of the HEIs on the Danish side are not considered universities, but Schools of the Fine and Performing Arts and are thus not counted in.

⁴⁵ The Danish Rectors' Conference: http://www.rektorkollegiet.dk/sider/tema_debat/Statistik/gennemf%20f8relse.pdf (14-05-2005).

⁴⁶ The number of employed university graduates increased from 120,000 to 171,000 between 1993-2002. Source: http://www.rektorkollegiet.dk/sider/tema_debat/Statistik/job_ledighed.pdf (14-05-2005)

⁴⁷ Please note that the municipalities primarily fund the study centres.

⁴⁸ Vice-chancellor Göran Bexell (2002) – www.lu.se/upload/LUPDF/Om_LU/Budgetunderlag2004-2006.pdf

Figure 2.7: Recruitment of students with working class background

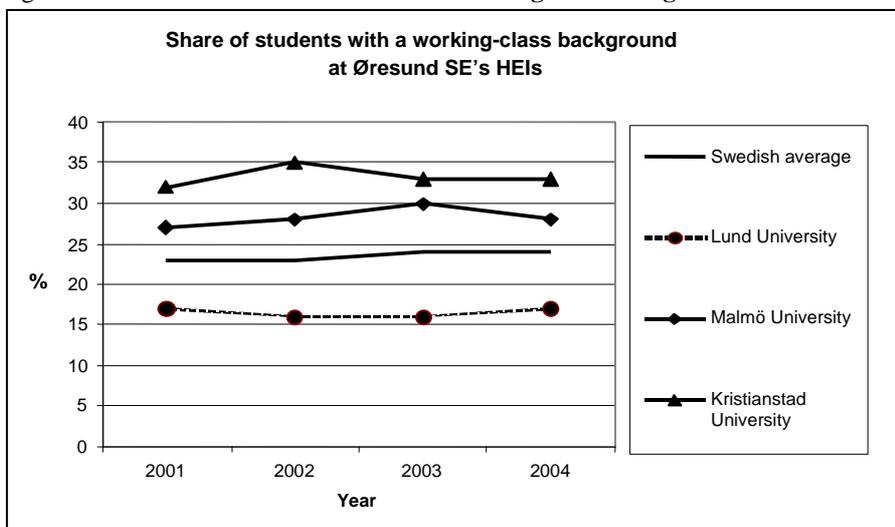
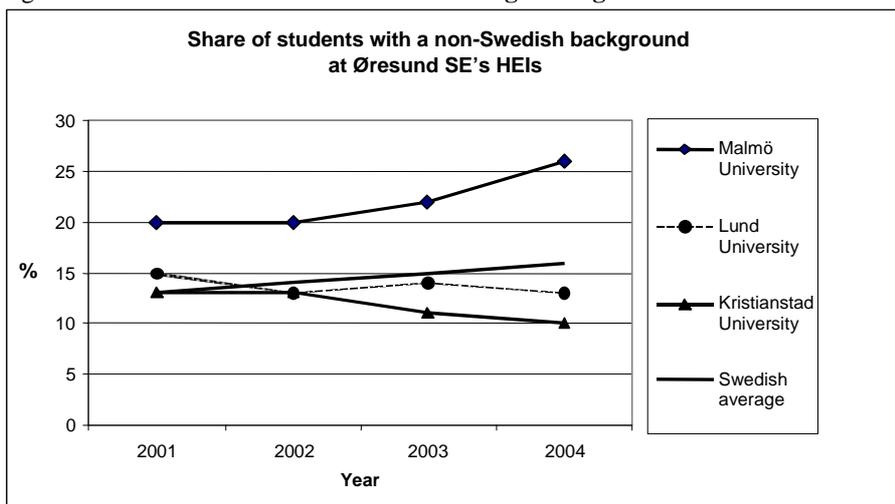


Figure 2.8: Recruitment of students with foreign background



Source: National Agency for Higher Education (for both figures)

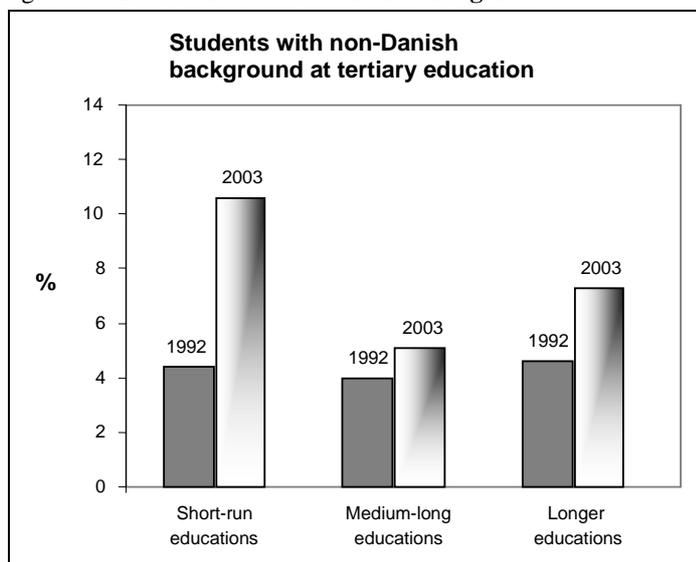
LU has a low percentage of both, in fact the nation's lowest percentage of recruitment of students with working class background and one of the nation's lowest levels of students with foreign background. Hkr and Mah have on the other hand the highest percentages of students with working class background, which reflects the social structure of the local recruitment area. HKr is one of the best universities in Sweden to recruit students from non-academic backgrounds: 84% of the students at HKr are from a family without higher education. Mah is well above the national average when it comes to students with a non-Swedish background, and the increase for Mah in recent years has been higher than the national average. Mah has twice received recognition for being a front-runner for well-organized and thorough work in order to promote social and ethnical diversity amongst the students. The recognition received in 2004 by The Swedish Agency of Higher Education (Högskoleverket) stated:

“Malmö University has formulated its own far-reaching alignment and aims and has developed methods to increase social as well as ethnical diversity. This ambition have produced results and contributed to Mah meritoriously having increased the diversity amongst the students”.
(source: www.mah.se)

This uneven distribution of certain groups of students can to some extent be explained by traditions in the programmes and courses offered to students. Firstly, the two newer HEIs; Hkr and Mah, offer more educations directly aimed at the labor market (teachers, engineers, nurses) than Lund does, and secondly, several of the educations in Lund are very prestigious and competition for entrance is fierce. This tends to favor students from academic backgrounds.

Though none of the Danish universities have strategies for widening participation, it is very notable that tertiary educations in Denmark overall have increased the share of students with a non-Danish background as figure 2.9. shows below. The students with a non-Danish background often study more traditional educations, such as medicine, engineering and law. No figures concerning students with a working class-background exist⁴⁹.

Figure 2.9: Students with non-Danish background



Source: Danish Ministry of Education (2004) Data based on all tertiary educations in Denmark, not the Øresund Region exclusively.

As the diagram shows, the number of students with a non-Danish background is highest for the short-run educations, but there has been an increase in all three categories in the period 1992-2003.

2.6.2. Internationalisation

The HEIs in the Øresund Region welcome many international students every year. It is not, however, a homogenous group. It consists of at least three major subgroups:

1) Swedish students at Danish HEIs

Students from all Nordic countries can apply for university in all Nordic countries on the same terms. In practice, this has led to a movement of Swedish and Norwegian students to the HEIs in Copenhagen,

⁴⁹ Source: Danish Ministry of Education- <http://pub.uvm.dk/2004/kryds/kap06.html>

primarily to study Medicine, but also Architecture, Veterinary Medicine and Design have large groups of Swedes and Norwegians. With the Swedish membership of EU, this is now under the general rule of free movement of labour and goods. Particularly the large number of Swedish students at the Danish medical schools raises public concerns in Denmark. In 2005, the debate was more heated than in previous years, not least due to the difficulties the Faculty of Medicine at KU had in getting the university hospitals in Øresund SE to accept trainees. With one third of its students coming from Sweden, the Faculty of Medicine found it suiting that the hospitals in Øresund SE accepted more trainees. In a few hectic weeks, a deal was negotiated.

2) *Full-degree students*

The number of foreign nationals studying for a full degree in both Denmark and Sweden is rising, but from a low level, not least due to the language barrier. Many of the HEIs in Øresund have expanded the number of programmes offered in English in order to attract international students. Today, all students (international as well as national) receive their education free of charge, but in Denmark legislation will change from 2006/2007, so that students from outside the European Union and the European Economic Area will have to pay tuition fee. In Sweden legislation change to the same effect is under consideration.

3) *Exchange students*

The number of agreements with foreign HEIs to exchange students is increasing year from year, and so is the number of exchange students. With the European programmes for increased student mobility (Erasmus and Socrates), a large number of Danish and Swedish students go south every year and in the place students from Europe come. There is also widespread exchange with HEIs in North America, Australia and Asia. The large HEIs have the largest portfolio of exchange agreements, but all students at the HEIs in the Øresund Region have the possibility to study abroad if they wish so.

To conclude: the HEIs in Øresund are all open to international students, but this area is also one of potential conflict because of the way, the university systems are funded in both Denmark and Sweden. In the long run, it is not sustainable to provide foreign nationals education for free. The most obvious solution would be to introduce tuition fees for all, and changing the national funding system to “backpack financing”, i.e. to let the national funds follow the student, rather than the institution.

With the increasing internationalisation, the global competition for the most highly educated will continue to increase, and both Denmark and Sweden will be forced to initiate some sort of effort to recruit students from outside Europe. This calls for both more programmes offered in English, but also a change in the national discourse on foreign nationals.

2.7. Relations with the surrounding community

To be embedded in a regional context – be it the Øresund Region or another – is a means to establish a firm identity for several of the universities. Several of the HEIs – for instance Mah – find that a firm regional embedding is important, but they still consider themselves as having a national and international focus. Others, for instance ITU, have a corresponding institution in another part of the country. This adds a regional perspective to the national and international perspective. In general, the HEIs in the Øresund Region all see themselves as national education institutions (some with a regional focus as well), and all have clear international ambitions.

During the last couple of decades, there has been a swift development with regards to the links and contacts between the universities and the surrounding community. Both public and private actors have come to view the university as a more and more important part of the societal infrastructure. For many, the role of HEIs as ‘ports of knowledge’ leads to a perception of a HEI a promoter (or sometimes even a prerequisite) of growth.

Furthermore, the universities and the university colleges have taken on the new responsibility of disseminating knowledge to a very large extent. In Øresund SE, establishing outreach campuses and university branches has contributed to this – for example LU’s branch in Helsingborg, Hkr and Mah, which was founded to combat unemployment and the low educational level in the area.

The Swedish National Agency for higher education undertook an evaluation of the collaboration of Swedish universities and university colleges with the surrounding society in 2004⁵⁰, and some of the results concerning the HEIs in Øresund SE are found below. Examples of the engagement of the HEIs in the Øresund Region with external partners are manifold.

LU is collaborating with the community by spurring its students to make use of their acquired skills to start up companies. The university is offering a course, “Innovationer och Företagande” (“Innovations and Companies”) provided by the Faculty of Science. The well recognized career centre at the School of Economics and Management as well as the Foundation for Partnership, whose aim is to nurture networking between the institution and surrounding community, are other good examples.

Mah collaborate through labor market fairs, study visit at companies, project work in collaboration with companies to mention a few.

In Øresund DK, no overview of the engagement with society exists, but to illustrate that also the Danish HEIs are engaged, DFU is used as an example. DFU has a vision of “promoting the knowledge of pharmaceutical sciences through targeted communication and dialogue” to the community. One of the tools used by the DFU is distribution of their popular science periodical distributed to all science teachers in the secondary schools. The university has also made it easier for citizens interested in science to find popular science articles about the university’s research on their web page.

2.7.1. Regional expertise used in education

By applying the skills of the region to education, the HEIs increase the collaboration with the surrounding community. As an example, within the education in technology, LU often involves representatives from the regional companies in guest lectures, thesis guidance and other projects. Similar involvement is seen at the faculty of Economics and Administration where guest lectures from regional companies regularly are invited. Involvement of regional professionals is especially common in the faculties of Medicine and Law, where many lecturers and professors have dual employments: both in the university and with a business.⁵¹ Mah creates linkages with the community by offering students, at some educational programs, parts of the program spent at a regional business or organization⁵².

2.7.2. HEIs as ‘ports of knowledge’

The HEIs distribute knowledge in more ways than through the supply of graduates. The different institutions and facilities that constitute an HEI are all becoming important in the disseminating of knowledge to the community. The university libraries can illustrate this; they are open for the public, everyone can take part of information and publications. Furthermore, the old universities in the region like LU and KU have national treasures in their libraries and play a vital role in the preservation of a legacy. Further, by having their own companies, university staff, particularly in areas like engineering and science, can contribute to the transfer of knowledge from the HEIs to the society. The HEIs also contributes to the community by being ‘ports of knowledge’; the HEIs obtain

⁵⁰ Högskoleverket (2004a)

⁵¹ Nationell kvalitetsbedömning av samverkansuppgiften -LU

⁵² Nationell kvalitetsbedömning av samverkansuppgiften- Mah

information and knowledge from researchers, other universities etc that is spread to the community. The HEIs work as “ports of knowledge” through guest lectures; a widespread feature in all courses offered by the HEIs.

Formally, the HEIs do not provide any services (counseling, economic or judicial assistance) to the community. Here, it is important to keep in mind that both Denmark and Sweden are welfare states and thus have a relatively large public sector and many public services. However, the skills and knowledge at the HEIs are naturally used at will of the society – KVL, for instance, has an animal hospital, and there are several examples of voluntary student organizations providing for instance legal advice for free.

With regards to facilities, the universities are publicly owned and as such open for the public. The universities all give relevant organisations (student organisations etc) access to hold meetings, seminars etc in university buildings.

2.7.3. HEIs’ involvement in regional bodies

The universities’ engagement in the Øresund Region is mainly structured around the Øresund University and Øresund Science Region. Here, the vice-chancellors of the universities as well as other university employees serve on the boards and in the platform organizations. Furthermore, there are many local, regional, national and international contacts that are all dealt with and implemented on the departmental level, thus no central overview exists – the one exemption is Copenhagen Business School, whose academic staff held positions on 170 external boards in 2004.

2.7.4. The planning and adjustment of programmes and courses in the region

To some extent, the planning and offering of courses and programmes are adjusted to labor market needs – something that is also a legal demand in both countries. The universities in the region confer with employers, labor unions and public authorities to a larger or smaller degree. Some universities have panels of employers to advice on the contents of the programmes – for instance DPU and KVL. At DTU, for example, the supply of courses and programmes are decided on the basis of a number of parameters, for instance the needs of the labor market and in relation to the research programmes taking place at the HEI.

In general, the universities in both the Danish and the Swedish part of the Øresund Region have the mandate to decide which programmes to offer. The HEIs in the Danish part of the Øresund Region are granted a fixed amount for each graduating student and consequently the more expensive educations need to have an upper limit. Therefore, the responsible Ministry of Science, Technology and Innovation can decide how many students are to be accepted to these educations. Until now, the limits have only been applied to the expensive educations in medicine, whereas almost all programmes and courses on the Swedish side have strict limitations set by the universities themselves.

The Swedish universities are governed slightly different, as the Swedish government sets up targets for the university to meet. Among the targets are the maximum numbers of students paid for and this of course impacts the intake of new students meaning, of course, that the Swedish universities have much more competitive and tougher entrance limitations.

2.8. The Øresund University – regional collaboration between HEIs

Øresund University is a consortium of fourteen universities and university colleges on both sides of Øresund. This consortium of universities is based on the geographical proximity and a long common history and culture. It is said that in spite of the different traditions and bi-national background of the HEIs the collaboration has turned out to be one of the most successful in Europe. The Øresund University accomplishes a number of tasks:

- **Educational collaborations between universities.** A great deal of more or less formal partnerships has been established. And more are on the way. The collaborations reach from small-scale exchange of students and information on courses to full-scale master programmes.
- **Opening up all courses and facilities.** Students from all over the region are given the opportunity to participate in courses and programmes at all 14 HEIs. Furthermore the facilities at each HEI are open to all students and researchers as well.
- **Promoting education on both sides of Øresund.** Information in terms of web sites, brochures and booklets provide students from Sweden and Denmark with substantial information on study life in the two countries
- **Øresund Summer University** is a new and innovative summer university, established in 2001. Through Øresund Summer University, a variety of universities offer summer courses of outstanding international quality within our areas of expertise. The courses are taught in English and attract students from all over the world each summer.
- **Research collaboration.** Research in the region is improved through the different partnerships between HEIs.
- **Focus on international relations.** By joining hands the HEIs of the region become more attractive in an international dimension.

From an educational as well as scientific point of view the potentials of university collaboration is high; with some 150,000 students and approximately 12,000 researchers the possibility of joint ventures that could create unique educational force fields is present. The Øresund University started out with 11 universities and university colleges, but has continued to develop, both in numbers of member HEIs, educational joints and full-scale masters programmes.

It has naturally had a major impact on the collaborations that the Skåne and Sjælland were merged with the bridge in 2000. Earlier, transportation across Øresund (without the bridge) was a rather big hurdle, but today transportation time to respectively Malmö and Lund from central Copenhagen is 35 min and 60 min. A major barrier remains, though: the high costs to cross the bridge.

Educational collaborations

The member universities of the Øresund University practice four different kinds of co-operation, which vary in degree of integration among the HEIs participating. The four different models can be described like this:

- **Shared educational information.** *Co-operation between two or more HEIs on how to take advantage of the options found at other HEIs.*
- **Joint courses.** *A formalized co-operation on a number of courses.*
- **Educational integration.** *Education that is offered in close co-operation with another university (or more) and gives the opportunity of completing part of the education at that university.*
- **Joint education.** *A fully integrated education among two or more HEIs in the region.*

Some of these models are easier to implement than others, and it is common to use a method of trial and error. Collaboration takes place on initiative from the HEIs involved. Some of the collaborations that have been instigated have proved unsuccessful (one major problem here is the travel costs across the Øresund bridge) whereas others have been successful.

Table 2.5 shows a number of examples on educational co-operation between the universities. As co-operation is not centrally directed or co-ordinated, no data covering all co-operations exist:

Table 2.5: Overview of some of the educational collaborations within the Øresund University

Asian Studies	Engineering studies in meditech
European Studies	Horticulture
Sports Studies	Food Science
Mathematics	Food processing technology
Meteorology	Environmental chemistry
Mycology	Social Sciences
German	Economics
East European Studies	Øresund School of Marine Biology

Source: Øresund Study gateway, www.studygateway.org

As mentioned above, not all collaborations between the HEIs in the Øresund Region have proven successful. Some have ceased to exist, whereas others continue on a small scale. Typical problems include administrative differences, travel costs for students and teachers and lack of joint planning between the HEIs involved.

Described below are two examples of the educational partnerships between the HEIs. The examples illustrate the variety of the partnerships, which are found in both the natural, social and humanistic sciences. The partnerships give the opportunity of joining experts and expert knowledge and thereby creating some unique opportunities in terms of education and research. An educational partnership in the Øresund Region means that education and research take place at all the participating HEIs. The examples give an idea of the nature of the co-operation that takes place within the Øresund University. The number of these educational partnerships is growing, as well as the number of students enrolled. Even though a great deal of the collaborations have only been running for a few years or less and are still in an initial phase the interest from students and researchers show that they will to a large extent end up as successful collaborations.

Dairy Science

The International Master of Science in Dairy Technology is a 2-year Danish-Swedish collaborative academic program, which will provide the enrolled students with a high-level, research-based teaching in Dairy Science and Technology within an international environment. Graduates will attain an updated, comprehensive knowledge that can function as a basis for their future careers within the dairy industry or related areas. Career opportunities will be within production of dairy products, in research and development, quality control as well as in management in the dairy and food sector. The International Master of Science in Dairy Technology is offered in collaboration between KVL, DTU and LU⁵³.

Environmental Chemistry

The education in environmental chemistry is a two-year master study in Copenhagen. The core topics in the education is advanced environmental chemistry in the soil, water and air compartments, furthermore, environmental risk assessment of pollutants is a main subject. Four universities in Copenhagen provide their experts within environmental chemistry in the cooperation of this education. Therefore students get the opportunity to become acquainted with leading specialists in environmental chemistry in the Copenhagen area. Masters in environmental chemistry have qualifications for working in industry, consulting companies, academia and public administration. The key qualifications in many job situations will be the scientific fundament obtained during this education. KU, DFU and KVL have since 1993 collaborated in this education. From 2005, DTU has joined the partnership⁵⁴.

⁵³ Source: <http://www.dairymasters.kvl.dk/index2.htm>

⁵⁴ Source: <http://www.environmental-chemistry.dk/>

Opening up courses and facilities

The main aim of the consortium is to stimulate the development of a significant science region by assuring a flow of knowledge in form of students, courses and researchers. By opening up courses (within certain and obvious limits), libraries and other facilities to all students, teachers and researchers it is believed that a positive sharing of knowledge can maintain the positive integrated educational development in the region. Everyone studying or researching at one of the member HEIs is to have easy access to "the other side" of the region. It is believed that education and research of both countries will complement each other and hopefully make the region a scientific and educational top region. Furthermore, Øresund University is engaged in a number of regional organisations working for the integration of the Øresund Region. In total, Øresund University aims at making the university sector more attractive on a regional, national and international level than the sum of its parts.

Promoting education on both sides of Øresund

In order to gather all the information of the different forms of co-operation the Øresund University presents its full activities on the internet. Øresund Study Gateway is an online web portal that gathers information about all the study possibilities at the 14 universities in the Øresund University consortium. For students wishing to study in the Øresund Region, the portal offers an easy overview of the more than 4000 educational programs and courses that are offered by the universities. In addition the portal contains information about the Danish and Swedish university system, admission requirements, the social life at the universities and the possibilities students have of attending courses at another university within the consortium⁵⁵. The Øresund Study Gateway has recently been introduced in English, which gives further possibilities of promoting the region to a wider audience. This should also be an opportunity regarding the introduction of new educational options to students around the world. They should in other words learn more about the 'ports of knowledge' in Øresund. A great deal of brochures and booklets has been published as well providing information on studies and study systems. Most of the educational collaborations have their own webpage providing information to the interested students.

Øresund Summer University

Øresund Summer University took off for the first time in 2001. It combines the forces of the Øresund University and offers courses that relate to the peak competencies in the region. In 2005 the Øresund Summer University presented more than 80 courses.

Through Øresund Summer University, the 14 HEIs offer courses of highest international quality. Together, the HEIs in the Øresund region cover almost all academic disciplines, and the academic level is very high. The courses fall into two categories: Øresund Summer Courses and Member University Courses, which are courses that are given by the individual universities within the Øresund University. The Øresund Summer Courses are specially funded courses, and therefore only a few of these courses are subject to tuition fees.

Research collaboration

Since 2001, Øresund University has been involved in creating collaboration between the university sector, private companies in the region and local, regional and national authorities within Øresund Science Region. Starting out as a cross-border regional cooperation project with financial support from the Interreg IIIA-Øresund programme, Øresund Science Region (a cluster-facilitating organisation) today is a permanent organisation financed by the three parties involved and comprises nine platforms. Øresund Science Region will be dealt with in details in Chapter 4.

⁵⁵ Source: <http://www.studygateway.org>

Focus on international relations

The HEIs in the Øresund Region has a strong international focus and the international dimension is seen as an area of increasing importance. The 14 member universities have a total number of 800 formal contacts with universities spread around the world. The agreements make it far easier for the students of the region to take a part of their education in a university far away from Øresund. But the agreements also work the other way round. Every year a relatively high number of exchange students spent a semester or two at one of the HEIs in the region. Approximately 10.000 students from both nearby universities in Europe, and from distant locations all around the world take advantage of the educational possibilities in the region. Within the Øresund University-framework, an international committee has been established, creating a forum for exchange of experiences and administers an exchange agreement between Øresund University and University of North Carolina (UNC).

2.8.1. History of the Øresund University

The Øresund University started out as collaboration between KU and LU called SULK. The collaboration was founded in 1997 . Before the collaboration no formal co-operation between universities in the region existed. The students were given the option of taking part of their education at the neighbouring university, even though it was located in another country. The forming of SULK resulted in an increased belief in a positive outcome of a formalized collaboration between universities from Denmark and Sweden. Other HEIs in the region saw the potential of the collaboration and reached out in order to form a collaborative organisation that could establish educational and research co-operation. In 1997, the cooperation between the University of Copenhagen and Lund University was expanded to include 9 other universities in the region. With this, the Øresund University was formed. Today (2005), the university alliance comprises 14 HEIs (4 Swedish and 10 Danish HEIs).

A board of the fourteen vice-chancellors of the participating institutions governs the Øresund University. A secretariat manages the day-to-day running of Øresund University and is responsible for coordinating all projects in which it participates. The member universities all pay membership fees. The various co-operation efforts within Øresund University take place mainly at faculty and departmental level as projects, networks or formalized agreements about education and research. Co-operation also comprises many other university sectors such as study administration, contacts with the surrounding community, international issues and information.

2.9. HEIs and city planning

Universities do not only have an influence on society through education and research. Universities also mean buildings, physical planning, infrastructure, student colleges, pubs and shops, and, of course, adjacent science parks, hospitals, start-up companies, and very often both small and large companies. In that sense the location of universities can have a substantial impact on its surroundings. Universities, both as buildings in se, institutions employing thousands of well-educated people and centres for research and development, tend to become more and more important in city planning and city renewal. They then also become an area where state since they are state-owned and municipality can meet and compromise.

The region is home to HEIs with histories and traditions that date back hundreds of year. The University of Copenhagen was founded in 1479 and in Lund, which just a few years prior had been under Danish rule; the university was inaugurated in 1666. In the 19th and 20th century the university sector was further enlarged and new ideas of structure and location were tested. Øresund has about five hundred years of university building. Visitors to the region will be able to visually follow the development from medieval universities to post modern science cities.

In the region it is possible to take a closer look at five stages that signify development over time but also exist side by side. The five stages are not unique to Øresund, but what is unique is that all five stages can be seen and experienced throughout the region on a comparatively small geographical area. These stages also illustrate the

continuous growth of universities from small church oriented annexes to major international institutions with world-wide connections with thousands of employees and ten thousands of students.

Cathedral University - Quartier Latin

The two oldest universities in the region, KU and LU, still have their main university buildings near the cathedrals in their respective cities as a memory of the close links with the church. The universities have long outgrown these very often beautiful and touristy buildings and moved over to the other categories but still have their central administrations in them.

Instead a kind of Quartier Latin atmosphere has grown out of the old student and professorial hangouts with trendy shops, discos and restaurants and exclusive apartments. The free and happy life of the eternal student from centuries back still lives among designer offices and international backpackers.

Urban University

The new universities that were created in the 19th and first half of the 20th centuries and the expanding old universities found premises where they could. They were spread out over the cities just like normal offices for banks, companies or local authorities. The universities became invisible in or inseparable from the normal city milieu. The city or municipality was stronger than the university. These university facilities are mainly gone now and the buildings torn down without anyone mourning them.

University Campus

The 1960s saw a worldwide explosion in student numbers. New ideas about university life appeared. The campus university was introduced. Just like the new suburbs with big apartment buildings in concrete large and isolated campuses were built round Copenhagen and Malmö/Lund. DTU moved to Lyngby, the faculty of technology at LU got new premises on the fields north of the city; RUC was built outside the ancient cathedral city of Roskilde in a proud defiance of old university tradition. The result was that the universities and students disappeared from the cities.

City Renewal

Universities continued to expand although not as dramatically after the 1960s explosion. The campus university sites could not swallow the new expansion. Cities grow old and need rejuvenation schemes. In the 1970's, 80's and 90's, universities and students were more and more seen as useful in all these necessary renewal plans of city centres or underprivileged areas. It was particularly attractive to let universities take over old hospitals, factories and military barracks, particularly since these buildings very often were located in rundown city districts. Instead of city ruins with unemployment and other societal problems you get well-paid and well-behaving professors and students plus institutions that pay good rent with state money. Universities became valuable for cities and communities, instead of planning problems like the crowded urban universities were. The newly built facilities of CBS illustrate well a city centre university with these facilities connected by the new Copenhagen Metro. CBS is probably the only university in the world with three metro stations on its city centre campus.

Science City

The last stage is where the university is seen as one of the major if not the major asset when it comes to city growth and city renewal. New towns or districts are planned and being built with university, residential areas, companies, restaurants and hotels and at the same time science parks and labs being integrated into one whole new town. The youngest Danish university, ITU, is located in Ørestaden, the one of largest on-going new town development project in Europe⁵⁶: Here, also the Faculty of Humanities at KU is located. In Sweden science cities

⁵⁶ Source: <http://www.klp.com>

are on a smaller scale seen in the western port in Malmö and the north of Lund.

The latest trend here, which is a combination of City Renewal and Science City, is port universities where the desolate port becomes the home for universities, for art and design schools, for science parks and new companies very often combining old buildings with experimental architecture. A good example of this is found in the region. In the city of Malmö problems with rising unemployment arose already in the 1970s. Several big employers (for instance the shipyard Kockums) went out of business, which led to a severe economic crisis. A government report⁵⁷ argued that establishing an HEI in the city of Malmö would lead to increased regional development and change the old-fashioned industrial structures in the city. In 1996, it was decided to establish Malmö University and the first students were admitted in 1998. Today, the university library and the Faculty of Education is situated at the harbour front in Malmö. Another good example of port universities are the many schools of fine and performing arts within acting, music and film, situated in the old naval base (Holmen) in Copenhagen close to the new built opera. A third example is Campus Helsingborg, which is a branch of LU that was located in the Helsingborg harbour. Thus, these three biggest ports in Øresund (Copenhagen, Malmö and Helsingborg) have all got their own port university facilities.

All in One

Lund University was born as a Cathedral University in the 17th century with its main building two hundred metres from the church. Over 350 years the university has developed into a very modern big research university. This development can be seen in the buildings and facilities that stretch continuously northwards from the 11th century Cathedral to the very modern 21st century buildings to the north of the campus just like the annual rings of a thousand year old oak tree. In the southern and oldest part of the campus are buildings for humanities, law and social sciences. Gradually they change into science, medicine and technology. The northern part of the campus that has buildings and facilities from the 1960s to the year 2005 has as its nucleus the faculty of science. The more applied faculties of business administration, medicine and technology surround it. Around medicine and technology are the University Hospital and the science park IDEON. The next layer is the industries. There you can find pharmaceutical companies like Astra Zeneca or IT companies like Sony Ericsson. This northern campus is unique in the way it has within walking distance the whole chain from basic scientific research over applied technology and business administration to science parks and high tech companies. It is the biggest concentration on a quite small area of research, innovation and development in Scandinavia.

2.10. Visions and challenges

In this chapter we have taken a closer look at the characteristics of the higher education system. We have taken an in-depth view, both on a national as well as a regional level. Even though the collaboration between HEIs in the region has turned out to be rather successful there is still a number of challenges and barriers to overcome. In this final part of the chapter we will take a closer look at these.

The main findings in this chapter are:

- The HEIs do not consider themselves to be mainly regional universities but rather national and international. They consider themselves places where top researchers and scientists meet the students of the two countries. There is, though, a small but clear and obvious difference between the universities in the Danish capital and Skåne. Probably, a university becomes less “national” the further away from the capital it is.
- The Øresund Region is among the top five regions in Europe when measuring scientific output. Thus, there is a very large concentration of knowledge in the region.

⁵⁷ Statens offentliga utredningar (1996)

- The HEIs in the region do not recruit solely from the region. The most precise data is available for the Swedish part, where LU in 2004 recruited less than 50% of its students from Skåne. In the Danish part, several of the universities have national monopolies on “their” education, and thus recruit nationally, whereas others have a more regional base. This is especially the case for RUC, recruiting 85% of its students from the Greater Copenhagen Area.
- The HEIs on Øresund SE have engaged themselves in widening participation according to the university act. These regulations do not apply to the HEIs in Øresund DK.

2.10.1. Further collaboration between the HEIs in the region

The collaboration across Øresund between the HEIs should be strengthened within the Øresund University consortium. The HEIs of the region could all benefit from a strong organization working solely to improve the conditions for co-operation in the region. With a strong ØU more and better collaborations could be built up. At present ØU does not on its own behalf initiate collaborations – it is the different HEIs, which make the first contacts. By making ØU the initiator its substantial knowledge could be used to take advantage of the competencies found at the HEIs in the region. More collaboration between HEIs will give opportunities to make a more efficient division of labor, especially among the less frequented programmes (i.e. “smaller” languages and some physical sciences), and thereby strengthening the opportunities to enhance the teaching and research within these areas. On the other hand more collaboration between the large programmes and research areas could strengthen the specific HEIs performance within research and education, as well as the whole Øresund Region compared to other regions around the world.

2.10.2. Increased student mobility

The cost of crossing the Øresund is still relatively high having in mind the low income level of students. The bridge has reduced the transportation time considerably and has provided a breeding ground for an integrated area of education. But the transportation costs needs to be reduced in order to stimulate further growth, not just in terms of education but in research and development as well. Göran Bexell, vice chancellor of Lund University and chair of Øresund University in 2005 states it this way:

“One of the most significant barriers for student mobility in the Øresund Region is in fact the high cost of transportation across the Øresund Bridge – it is neither the character nor the extent of collaboration. There is a great deal of very good educational collaboration within the region.”
(ØU Nyhedsbrev, Januar 2005, our translation)

Should transportation costs across the Øresund be lowered, student mobility is most likely to rocket. This would lead to a more efficient university education system, as the individual HEIs in the Øresund Region then would be able to specialize even more, without the loss of knowledge for the region as a whole. Further specialisation would also lead to improved performance of research. Students discount on travels within the Øresund Region should be considered an essential part of the political agenda in relation the further integration of the two countries in the Øresund Region.

2.10.3. Structural harmonization

When the Swedish Parliament decides to accept the Government’s proposal of introducing a three-cycle structure in line with the Bologna process in Sweden, educational co-operation as well as student mobility will increase. Today, two quite different systems exist in the region, and this of course hampers the possibility of students having their credits transferred. A lot of work has been done with regards to issuing credit transfer tables within several of the educational co-operations, but with more similar structures in accordance to the Bologna model, the credit transfer process would be much simpler bureaucratically. Similar structures would lead to increase co-operation and improve student mobility, which in turn would lead to further specialization and optimize the tertiary education system in the region.

2.10.4. Further internationalization

The HEIs in the Øresund Region can and should exploit the possibilities the internationalization of tertiary education offers. With the development of more joint degrees, for instance within the Erasmus Mundus-programmes (this would require a partner university from an EU-country) the HEIs could take more advantage of the intense concentration of knowledge that is present in the Øresund Region.

Increased focus on the Øresund Summer University

The Summer University held in the region on an annual basis should be regarded as an exhibition window with great potential. By promoting the educational possibilities to a vast number of foreign students each year it is believed that a further increase in the total number of exchange students would appear. In that way many students within many different areas get to know the Øresund Region and this could have a positive effect on the region's ability to attract students and researchers internationally.

By offering summer courses to Ph.D. students; the region would become even further attractive to a greater number of tomorrows top-researchers.

Increased focus on Øresund Study Gateway

The newly launched English version of the web site Øresund Study Gateway is a major step with regards to further internationalisation. Yet there is still room for improvement. One of the things that could improve the cross-border integration for students would be an establishment of a common Øresund e-market for internships. An increasing number of students do apply for internships, yet few of them consider taking the internship on the other side of Øresund.

Øresund Study Gateway could also hold a database with information on the labour market in the two countries providing the students with information on working "on the other side" and job adds as well. Finally, the Øresund Study Gateway could present cross-border research project ideas related to the so-called science-shops that are found at most HEIs in the region.

CHAPTER III: THE REGIONAL INDUSTRY AND LABOR MARKET

Main findings in this chapter:

The HEIs

- Supply a great number of highly skilled graduates to the labour force and continues to update their competencies through life-long learning. A common labor market does not exist – rather two different markets due to differences in legislation and taxation.
- Are key actors in the on-going rise of knowledge intensive industries and businesses.
- Create new businesses and jobs through science parks, incubators and in other ways.
- The HEIs need to play a more prominent role in the region by further promoting life long learning and exploit how to use knowledge in new ways.
- Should engage further with labor market organizations to combat unemployment.

3.1. The Swedish and Danish Labor Market Systems

The Swedish labor market system

Of the Swedish population between 20-64, 77% is employed (2004-figures). Unemployment in 2004 was 5.5%. Unemployment among university graduates has for the last couple of years been a little higher than usual. This is most likely an effect of the downturn in the IT-sector from 2001. With the expected growth in this as well as other knowledge-intense sectors of industry, it is expected that unemployment among university graduates will decrease once again⁵⁸.

A number of different programmes and incentives to encourage demand for labor and generate employment have been put into place. Among these, start-up grants for unemployed starting their own company and wage subsidies (recruitment incentives) should be mentioned. As mentioned, Sweden maintains a welfare state system with a large public sector and a high level of taxation. This is also the case on the labor market, where employers pay a rather high payroll tax – close to 33% on top of the salary to the employed.

The Danish labor market system

Of the Danish population between 20-64, 73% is employed⁵⁹. Unemployment in 2004 was 6.2%. In Denmark, unemployment among all university graduates was 5.5% in June 2005, but for graduates under 30 the figure was 10.5%. The Danish government has launched several initiatives to combat unemployment among university graduates primarily focusing on jobs in the private sector, particularly SME's. Among the initiatives are job training programmes and wage subsidies⁶⁰.

The Danish labor market system has been described as a combination of flexibility and security – combined into the term “flexicurity”. It consists of liberal rules for hiring and firing (flexibility) and social welfare system with relatively high unemployment allowance (security) and a comprehensive system of adult and continuing learning, partly publicly financed. The adult and continuing learning system contributes to the general upkeep and update of competencies and skills in the society

⁵⁸ Source: <http://www.sweden.se>

⁵⁹ Employed (not seasonally adjusted, Q2, 2005: 2207500); Population (2005; 20-64: 3042979). Source: <http://www.dst.dk>

⁶⁰ Beskæftigelsesministeriet (2005): ”Flexicurity. Udfordringer for den danske model”. Source: <http://www.bm.dk>

Differences between the two systems

A 2004 report from the Øresund Committee and the Øresund Labour Market Council sums up the main differences in the following way⁶¹:

- Wages are lower in Sweden than in Denmark, but so is the individual taxation. Employer taxes are, on the other hand, much higher in Sweden than in Denmark.
- The Swedish labor market is regulated by the Parliament, whereas it in Denmark is more regulated by collective agreements between employer and labor unions.
- Generally, employment security is higher in Sweden than in Denmark – firing an employee is simply harder in Sweden
- Working hours per week in Denmark are 37, in Sweden 40.
- Etc (more information can be found in the abovementioned report from Øresund Committee).

3.2 The Øresund Labor Market

3.2.1. Characteristics of the Øresund Region

This section will be structured along four themes or central characteristics of the Øresund Region⁶²:

- A high-tech industry
- A highly educated workforce
- A well-developed infrastructure
- A high quality of life

The high-tech industry in the region is home to everything from small, new start-ups to major international players. What is unique for the region is the way industry, universities and government are linked together in different partnerships across the national border, making the region a dynamic cross-border region in Europe. In Chapter 4 we will go into more details about the collaborations between industry, HEIs and government.

The highly educated workforce is a result of the many HEIs in the region, providing tertiary education free of charge, as both Denmark and Sweden are welfare states. In fact, the region holds the largest concentration of highly educated population in Northern Europe, and more than one fourth of the population in working age in the region has a tertiary education⁶³.

The efficient infrastructure is seen in the well-developed communications links in the region, cutting travel times and paving the way for new partnerships, within as well as between Denmark and Sweden. As mentioned in chapter one, large investments in infrastructure has been made in the region during the last decade.

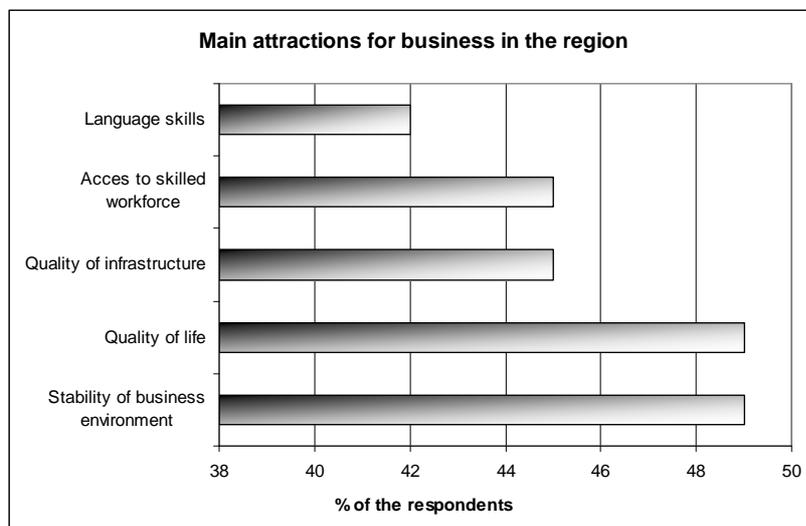
These four main strengths of the region are important for the development of the labor market since they create a good environment for location of industries and businesses, which in turn influence the labor market. In figure 3.1 below a list of the main attractions for businesses in the Øresund Region is presented:

⁶¹ Øresund Committee (2004)

⁶² Source: <http://www.oresundregion.org>.

⁶³ Source: <http://www.scb.se>

Figure 3.1: Main attractions for businesses in the Øresund Region



Source: Economist Intelligence Unit 2004

3.2.2. Industry structure

The region is enjoying a stable economic growth. It has been especially strong in the western part of Øresund SE and in the Copenhagen area, where the regional growth rate exceeds both the Swedish and Danish national rates⁶⁴. Thus, the economic growth in the region is concentrated in the parts closest to the waters of Øresund, which also are the parts in which the majority of the Øresund development have taken place. It is therefore very likely that a correlation between Øresund development and regional growth exists.

The Øresund Region houses some of the most successful and widely known businesses in the world. Sony Ericsson, Absolut Vodka, Astra Zeneca, IKEA, Skanska, Royal Copenhagen, Rockwool Insulation, Mærsk Line, Novo Nordisk, Carlsberg, and Georg Jensen are some of the businesses from the Øresund Region that have built world-known brands and are active on the world market. Naturally these businesses along with more traditional ones, contribute to the business and industry structure of the region.

Since the inauguration of the fixed link between Denmark and Sweden in 2000, many regional businesses have experienced an improvement, and in a recent survey carried out among employers in Øresund SE; a majority believe the bridge to be one of the important contributors⁶⁵. The employers stated that the market has expanded and they today have more customers from Denmark than before, and furthermore, that trade and commerce with the rest of Europe have been made easier due to the bridge. The region has attracted many Swedish headquarters and new companies, as the location in Øresund SE gives great benefits being close to Copenhagen and one of the largest airports in Europe. Also Danish businesses are expanding on the other side of Øresund; large furniture companies and food chains are among those who have recognized the benefits with the proximity to a larger market, and thus the home market for many businesses in the Øresund Region has expanded greatly. A larger region creates a larger outlet for goods, larger logistic system, and larger base for suppliers as well as larger capital market and recruitment area; the expanded market consequently gives the businesses economies of scale⁶⁶.

⁶⁴ Näringslivets Öresundsfakta (2005)

⁶⁵ Survey by Confederation of Swedish Enterprises

⁶⁶ Andersson, Henrik, Chamber of Commerce and Industry of Southern Sweden, guest lecture (2005)

Fact box 3.1

The Øresund Region attracts businesses and investments - some examples of businesses that make use of the Øresund advantages

1. **Stronger candidate for foreign businesses' Scandinavian HQ**
 - Alcatel commercial Nordic centre for 3G
 - Bayer (pharmaceuticals) relocates the Scandinavian headquarter from Stockholm to Copenhagen
2. **Swedish companies relocate to Øresund SE- easy access to Denmark**
 - Staffing companies Hammer & Hanborg and Alumni
 - Software Innovation
3. **Location for Swedish headquarters**
 - Duni from Halmstad to Malmö
 - Findus from London to Malmö
 - Thule from Brussels to Malmö
 - Daimler Chrysler from Stockholm to Malmö
4. **Logistics Centre**
 - Honda car importer
 - Toyota car importer
 - Cosmetics company L' Oreal
 - Glass manufacturer Pilkington

Source: Chamber of Commerce and Industry of Southern Sweden, 2005

Being a logistic hub has to a great extent benefited the economic trend. The Øresund Region has become a logistic hub as the distribution pattern has been able to change due to the bridge; Copenhagen Malmö Port (CMP) is a result of this; two ports in two different countries have joined all their port operations into one company and thus synergies in transport and logistics have been gained. CMP has become the import harbor for distribution of cars to the Nordic countries; Toyota ships all their cars – 100,000 annually – for the Nordic market to CMP, and Nissan, Chevrolet, Suzuki, Volvo & Renault, Peugeot and Fiat as well as American car makers use the new Copenhagen-Malmø port terminal. Copenhagen International Airport is another important actor on this scene, offering direct links to more than 120 destinations worldwide and being the seventh largest in Europe in terms of cargo⁶⁷. However, lowering the bridge tolls would facilitate the mobility within the region, thus improving the region as a logistic hub.

Sectors of Industry

Construction is one of the largest sectors in the region. During 2000-2010, €12 billion (90 billion DKK) is expected to be invested in infrastructure in the region; the metro rail in Copenhagen, and the City tunnel in Malmö are some examples. Large infrastructural investments have boosted the construction industry and during 2002-2003 construction works in the region increased with 11% - in comparison, Stockholm had a decrease of 34%. Another important sector in the region is health and the bio-/medicotech sector; having an increase in turnover over 36% between 1999-2002. The region is an attractive place for locating biotech and bio-/medicotech businesses, and the region is expected to attract ten new bio-/medicotech companies annually over the next couple of years. Other sectors of great significance for the region are retail sales and It/telecom. Retail has become increasingly strong as the region has attracted many outlets and malls, and in addition to this, the well-known Swedish furniture company IKEA has the fourth largest turn over on the Swedish side of the Sound.

⁶⁷ Source: <http://www.orelog.org>

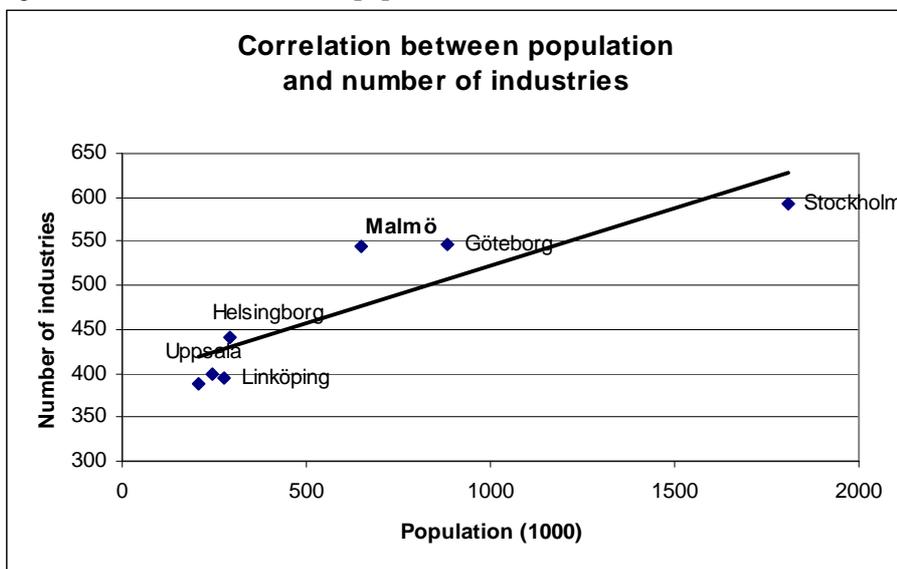
IT/telecom has started to recover after the fall of the global IT sector and the Øresund Region has become a cluster for companies in this field.

Another cluster, which due to the increased agglomeration effects in the region, has developed in the region is the bio-/medicotech/biotech cluster. The Øresund bio-/medicotech cluster in fact employs 50% of Denmark and Sweden's total employees of this sector⁶⁸. Other clusters in the region include food science, environmental science, logistics and design. Economists have during the last decade stressed the importance of regions having an inner structure of clusters as well as large markets, which in combination serve as a foundation for innovations and in turn create economies of scale in the cumulative base of knowledge⁶⁹.

Despite the fact that the Øresund regional markets are performing well, performance could be enhanced. The aim should not be to have one single integrated regional economy with a homogenous industry structure, but rather a dynamic, cross-border region with two compatible systems working alongside each other. The creation of a larger market would lead to economies-of-scale advantages (larger recruitment area, larger capital market and customer base as well as suppliers' market, larger logistic system as well as greater possibilities of cooperation⁷⁰). The dynamism and the energy of the Øresund Region stems from the differences in industry structure rather than the similarities, and barriers to be dealt with include the high costs of crossing the bridge as well as the two different currencies found in the region.

The population increase that the region has experienced has also had a positive effect on the industry structure. The situation of many industries in the Øresund Region has a positive linear correlation to the population as is shown for Malmö in figure 3.2; a small increase in population have generated a positive increase of industries.

Figure 3.2: Correlation between populations and industries in Sweden



Source: Chamber of Commerce and Industry of Southern Sweden (2005)

⁶⁸ Øresundsregionens Näringslivsfakta 2005, Chamber of Commerce and Industry of Southern Sweden (2005)

⁶⁹ Andersson, Thomas et al. (2004)

⁷⁰ Andersson, Henrik, Chamber of Commerce and Industry of Southern Sweden, guest lecture (2005)

The two national parts are geographically different but the industry structures are fairly similar, which most likely works as an advantage for both parts of the region. This might be one reason why the region has more cooperation than trade; homogenous industry structure promotes cooperation, heterogeneous markets promote trade. Companies in Øresund SE and on Sjælland cooperate almost as much with each other as they do with companies in Stockholm and in Jutland respectively. Trans-national co-operations by companies are exceptionally important for the regional integration in Øresund, as cooperation many times is the entrance to integration⁷¹. Different types of businesses integrate differently into the region, depending on the type of business; businesses in the service sector tend to open offices on the other side of Øresund to serve more customers, while manufactures typically gather all production to one location in order to minimize expenditures⁷².

The industry sectors with the largest growth in employment in the Øresund Region are Tourism, Construction and It/telecom. Other significant sectors of growth are Transport, Energy/environment and Bio-/Medicotech⁷³. The latter has been especially strong in Øresund DK with a remarkable employment growth of 13.8%. Corresponding numbers for Øresund SE is only 0.4% which makes Bio-/Medicotech one of the sectors of employment with largest dispersion between the Danish and the Swedish side.

In addition to the business sector, the public sector is of great significance in the region. As Denmark and Sweden both are welfare states, the region provides many health care services; the Region encompasses prominent hospitals in Malmö, Lund and Copenhagen, the latter being the national hospital in Denmark. Rigshospitalet (Copenhagen University Hospital) is in addition one of Denmark's largest training centers within the fields of the health and sciences. The many other healthcare institutions in the region add to the volume of the public sector and employment. Additionally, the Danish public administration is located in Copenhagen, and thus contributes to the large public sector.

Bringing parts of two countries to work together labor market-wise is not achieved without some difficulty. Two different regulatory frameworks must function together, and when the two national systems are too contrasting, new ways of structure and regulations must be found. In 1999, the two central governments published a report with visions of the Øresund Region that was about to be born, focusing on the possibilities as well as the barriers for integration. The report proposed some regulatory adjustments to boost the integration; among these initiatives labor market reforms, tax reforms, infrastructure, industry, education and environment. Since then, the only major change is the new tax structure, partly as a response to the increased number of commuters living in Øresund SE and working in Øresund DK.

3.2.3. The Øresund work force

The population in the Øresund Region is highly skilled, which results in a work force that stands strong in the increased global competition. When comparing the share of highly educated population with the rest of Sweden and Denmark, the Øresund Region shows an overall better result, which is expected due to the many HEIs in the region. It is worth noting that the highest percentage in Sweden is found in Lund, where nearly half the population aged 25-64 has a higher education⁷⁴. Figure 3.3 shows the regional disparities in the Øresund Region as Lund scores highly, while the percentage of Malmö is nearly half that of Lund's. The percentage of Øresund DK is more similar to the Øresund regional mean. Generally speaking, the division of the Øresund Region into an urban centre close to the waters of Øresund and a more rural setting in the hinterlands also comes into focus

⁷¹ Andersson, Henrik, Chamber of Commerce and Industry of Southern Sweden, guest lecture (2005)

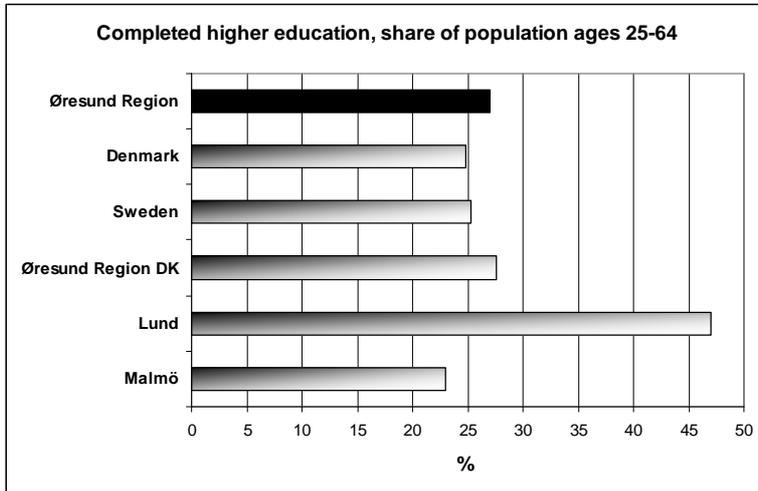
⁷² Andersson, Henrik, Nyhetsbrev Öresundsbron (2005)

⁷³ The Employment Service in the Øresund Region, Flaskehalssituationen i Øresundsregionen, (2004).

⁷⁴ Lund: 47%. Högskoleverket (2004c)

here, as the urban population is better educated than the rural. Thus, the geographical distance to a HEI seems to have a correlation with the level of education.

Figure 3.3: **Highly skilled population**



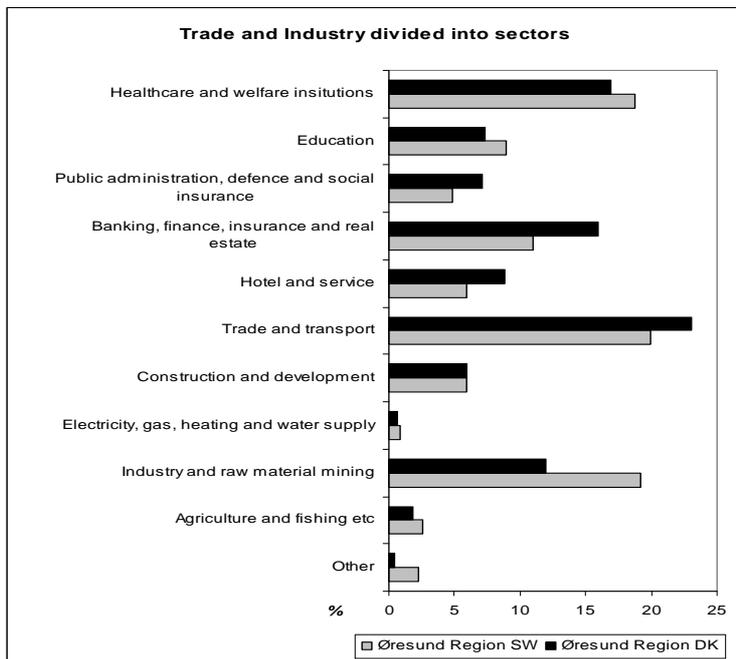
Source: Örestat, www.orestat.scb.se

Multilingual staff is easy to find in Øresund: the population's language proficiency is among the highest in Europe and thus adds to the strength of the work force. About 80% of Danes speak English, 50% speak German and most people have great knowledge of the other Scandinavian languages.

With a well developed welfare system, it is not surprising that the health care sector, shown in figure 3.4., employs a large share of the Øresund work force. Neither is it surprising that trade and transport employ a large share. Overall the employment in the region has had a fairly high growth rate of about 1% annually between 1995-2002, comparable to the growth in Stockholm and Oslo. Amsterdam and Helsinki had a higher growth of 2%, while Berlin and Hamburg were stagnant⁷⁵. The increase of the total work force in Øresund SE tends to be higher than the national rate in Sweden. Analyses point to an increased supply of work force in Øresund SE until 2020, which puts the region to the challenge of offering the work force proper education to meet the needs of the region.

Figure 3.4: **Sectors of employment**

⁷⁵ Ministry of Economic and Business Affairs (2005)



Source: Örestat (2001) - based on numbers of employed in different sectors

The Øresund work force is mobile and commuting across the Øresund is increasing. In 2004, 6-8,000 people crossed the Sound every day to go to work and another 2,000 crossed the Sound in other work related businesses. Of these 10,000 commuters, 75% travel from Øresund SE to the Øresund DK⁷⁶. The majority of these commuters are former Danish residents who have moved to Øresund SE but kept their source of income in Denmark⁷⁷. The transport sector, business services, retail sales, and health care are dominating sectors of employment for those who commute to Denmark⁷⁸. This push-effect away from Copenhagen is a result of high costs of living in Denmark and a housing shortage; thus creating integration of the housing market instead of a much anticipated integration of labor market⁷⁹.

A majority of the commuters have a higher education and a job found only on the other side of Øresund. That long-distance commuters have a higher education is a fact that is seen throughout Europe, the Øresund Region being no exception; mobility and a high-educational level are parallel. Collaboration between the HEIs in the Øresund Region creates a larger education base with a skilled work force, which is an incentive for graduates to locate to, or stay in the region upon graduation. A larger and more diverse labor market contributes to making the region dynamic and the interest for the region is in many ways intensified. For Øresund SE, it is a positive development to have 'gained' a capital, Copenhagen, through the creation of the Øresund Region. The labor market for the graduates from the HEIs in Øresund SE has been extended, creating incentives for graduates to stay in the region and not move to the larger cities in Sweden for employment.

As in Denmark and Sweden on a national level, men dominate the executive positions on the labor market in Øresund region. It is especially apparent in the private sector, but the pattern is also found in the public sector,

⁷⁶ Estimated by Øresundsbro Konsortiet

⁷⁷ Øresund Committee (2004). 5500 are commuters living in Sweden but working in Denmark. The opposite, living in Denmark, working in Sweden is estimated to 400 people.

⁷⁸ Øresund Committee (2005)

⁷⁹ Axelsson Anders, Øresund Committee, interview.

despite the fact that this sector employs more women than men. Divergence in wages between men and women are also found within the Øresund region; women in Øresund SE earn on average 76% of that of men, women in Øresund DK 80%. Though there are differences in the wages between men and women, the difference between the countries is not large, although an explanation for the divergence could be that Swedish wages often are individually set, whereas wages in Denmark follow set tariffs depending on education and experience⁸⁰.

3.2.4. Post-university labor market

In Sweden, the number of unemployed university graduates is increasing. This is most likely a result of the expansion of higher education in Sweden rather than a result of fewer jobs. The increase in the number of university graduates raises a number of challenges for the Swedish labor market. Due to high costs of hiring and firing, many small and medium-sized (SMEs) companies hesitate to employ university graduates due to lack of knowledge of their qualifications. In Denmark, the labor market has been much more successful in absorbing an increased number of university graduates, as the following section shows.

Studies of Danish graduates

The Danish university graduates have to a large extent found employment outside the public sector in the last 10-15 years. This applies to graduates from the faculties of the Humanities, the Social Sciences, Technology and the Natural Sciences⁸¹. Thus, the Danish labor market has absorbed a significant number of university graduates, and in the same period, the total student population has had a parallel increase.

Three of the Danish HEIs in the region (RUC, KU, and DB) have conducted surveys on their graduates. The three surveys have several things in common. Most interesting with regards to the transition from student life to graduate life is the importance of practical experience from the labor market. For Danish university students, having a study relevant job during their time at university serves two purposes: one economical and one career-wise. Furthermore, many graduates have done internships and/or project with public and/or private organizations and this has provided them with important knowledge and skills. The role of the universities in this is first of all to schedule classes in such a way that a part-time job on the side is possible, and secondly to incorporate internships and project work in the programs.

The graduates mainly find employment in the Danish part of the Øresund Region: in the case of DB, the Copenhagen branch supplies the labor market in Eastern Denmark and the Aalborg branch the Western part of Denmark. For RUC, most graduates find employment in the Greater Copenhagen Area (which is also where 85% of the students originate from). The most extreme example is KARCH, where 95% of the graduates stay and work in the Greater Copenhagen Area. It is very important to emphasize that the labor market for university graduates is very large in the Greater Copenhagen Area – almost 50% of all university graduates in Denmark work here – hence it is not surprising that the graduates do not relocate upon graduation..

Some fields of education have an easier transition into the labor market than others. Graduates from the bio-/medicotech educations tend to have an easy transition to the labor market; 43% of DFU's students are offered a job already before graduation and 88% are employed within the first three months upon graduation⁸².

3.2.5. Øresund Labor Market - a common market?

Today no such thing as a common labor market exists in the Øresund Region. Rather, a number of distinct labor markets exists, for instance one in the Greater Copenhagen Area and one in the urban parts of Øresund SE

⁸⁰ Øresund Committee (2005)

⁸¹ Ministry of Science, Technology and Innovation (2003)

⁸² Source: <http://www.mva.org>

(Malmö-Lund-Landskrona-Helsingborg). But it is worth reflecting over the potential benefits of having especially the two urban labor markets to function more efficiently together:

Many advantages can be reached through an more compatible labor market structure in the Øresund Region, for the businesses as well as for the labor force. It is furthermore argued that a better functioning cross-border labor market is a prerequisite for regional growth⁸³. The population density in combination with a highly skilled population makes the region an attractive location for businesses. A larger recruitment pool and a larger supply of graduates provide possibilities for growth. Also, for graduates entering the labor market, a larger functional market naturally provides greater possibilities of employment and bottleneck problems are diminished. This is especially important as the global competition is increasing⁸⁴. A recent survey show that 90% of all recruitment made in the Øresund Region is in fact made internally in the region⁸⁵.

The clustering of knowledge in the common market also contributes to attracting foreign direct investments.⁸⁶ Businesses such as Daimler Chrysler, L'Oreal and Schneider Electric have all relocated their Nordic head quarters to the region to make use of the regional advantages. The region can in turn make use of the advantages the relocations provide; more business in the region give rise to more jobs, and a more integrated market will better the match between the foreign companies and possible regional employees.

The Øresund Bridge, the ferry link between Helsingborg-Elsinore and improved infrastructure on both sides of Øresund have increased the accessibility and added to the labor market integration. Accessibility has increased, travel times have been cut, but the prospect of combining two labor markets into one common market naturally problems arise. High travel costs, differences in the educational systems as well as in languages are the main problems addressed in the Øresund Region, the same problems most cross-border regions are struggling with.⁸⁷ Two national systems have to correlate and as no regional exceptions to the national legislations exist, there still are barriers for a fully integrated labor market. Denmark and Sweden have different labor market rules and regulations: the Danish market is often perceived as more flexible, both for employers and employees, whereas the Swedish market has more rules to protect both the employer and the employee. Divergence in the rules makes information about the different systems crucial and regional stakeholders are working on decreasing the barriers and informing about the common labor market⁸⁸. The Øresund Region is performing well in informing and offering service in the field of the cross-border labor market and the work of organizations such as SkatØresund, Øresund Direkt and AF Øresund, facilitate the integration⁸⁹.

Although the unemployment rate in the Øresund Region has decreased from nearly 9% in the mid the 1990's to a about 6% in 2005, more initiatives and better upholding of the possibilities in the region would help make use of the potential that still is unused in the region today. In this way employment would most likely increase which naturally would increase regional growth.

A common labor market is more useful for some than others. The most and the least educated parts of the population tends to be more mobile, whereas the population with an intermediate education, who often have national collective agreements, only with great difficulties can make use of a common labor market. In addition,

⁸³ Øresund Committee (2004)

⁸⁴ OECD (2003)

⁸⁵ Øresundsregionens Näringslivsfakta (2005)

⁸⁶ Øresund Committee (2004)

⁸⁷ Øresund Committee (2004)

⁸⁸ Aaberg, Torben, interview

⁸⁹ Øresund Committee (2004)

those with an education specialized on either Danish or Swedish matters, such as lawyers⁹⁰, the common market can be difficult to use. But for most people, a common labor market increases the possibilities and carrier opportunities.

3.3. The effect of the HEIs on the regional labor markets

3.3.1. HEIs as regional employers

A university in many ways creates regional labor market effects. As the university creates job opportunities for teachers, professors and administrative personnel, the region benefits from the direct effects of the localization of the university. Furthermore, the university creates indirect effects through increased demand of day-care, housing, increased consumption etc, which in turn leads to increased employment⁹¹. In Lund the university employ 13.2 % of the city's employed population, a high percentage that indicates the value of the direct effects the university has on the community⁹². LU is in fact the university in Sweden with most people employed, and moreover, the city of Lund has the highest percentage of the city's total work force employed at the university⁹³. The HEIs are thus a large national investment in the Øresund Region.

3.3.2. HEIs' supply and the Labor Market demand

A large region like the Øresund Region holds a wide span of educations. Some of these educations lie in the fields of the peak competencies that the region holds. To establish causalities between the peak competencies and educations are however difficult as a number of other factors also influence the setup of industry and education in the region. In short, the educations might be a result of the industry structure or opposite; the industries might be a result of the educational supply.

Fact box 3.2:
Peak competencies in the Øresund Region:

- Medicine/ biotechnology
- IT/ Telecoms
- Food Science
- Environmental Science
- Logistics
- Design
- Nano

In the field of bio-/medicotech, one of the peak competencies in the region, DFU is one of the HEIs in the region that supplies graduates and research with high competence. Part of the vision for DFU is to meet the market's needs with their supply of pharmaceutical graduates. The demand for pharmacists is high, whereby DFU wishes to meet the market's demand by offering more educations in this field and thus contribute to the community⁹⁴.

Labor market needs are taken into consideration when the HEIs are planning and offering courses and programmes – something required by law in both countries. The HEIs confer with employers, labor unions and public authorities to a larger or smaller degree. Some universities have panels of employers to advice on the contents of the programmes – for instance DPU, DTU, ITU and KVL. As the universities control the selection of the educational supply to a large extent, the enrolment at the different programmes can naturally not be controlled. Students tend to apply for educations of their interest, regardless of the post-university labor market or demand.

The educational supply of the universities to some extent mirrors their environments. In Lund, a city with a centuries-long tradition of academia and with 13.2% of the work force employed by the university, more traditional programmes such as law and medicine are offered, whereas Mah, a new university in a city without

⁹⁰ Legal experts, law students etc.

⁹¹ Westlund, Hans (2004)

⁹² Source: <http://www.hsv.se>

⁹³ Westlund, Hans (2004)

⁹⁴ DFU, annual report (2004).

tradition for higher education and with a large amount of the population having a non-Swedish background, new and cross-disciplinary studies such as International Migration are found.

3.3.3. *Creating links between universities, students and the labor market*

All HEIs in the region are active when it comes to establishing links between the university/the students and the labor market. The HEIs see this as an important way of transferring knowledge to the labor market and also opposite.

Internships and project work with a company and/or organization help to create linkages to the labor market and are possible at most universities. This provides students with hands-on experience from the labor market and is – according to surveys of graduates – an important factor when it comes to finding a job after graduation. For instance, at DFU, 53% of the students write their thesis outside the university. At other universities, for instance DB, one term is reserved for business-related work, which counts towards the student’s degree.

Career fairs, Open House-arrangements and other activities also provide students with the possibility of creating networks and contacts with the labor market. Furthermore, career counseling is also available.

Most universities in Denmark have established “Knowledge Shops” (in Danish: videnskabsbutikker), where students can search for companies to do an internship or an exam project with, and companies can search for students to do project work. The Knowledge Shops thus function as central entry and exits points at the universities. At DTU, the ambition is that most student projects should be done in collaboration with a private company. This then creates contacts that could prove useful for the student after graduation, but it also helps to transfer knowledge to the industry. At ITU, matchmaking activities are regularly held for students and industry in Øresund DK, and ITU is considering inviting companies from Øresund SE as well.

But the activities of the universities are not limited to helping students find employment. At LU, Venture Lab has been created to help students create and develop business ideas and thus becoming entrepreneurs. Lund University is also co-owner of the science park Ideon in Lund that focus on young entrepreneurial businesses. Also in Lund, Future Faculty is an organization supporting young medical scientists.

The efforts HEIs put into matching their graduates skills and the labor market was recently evaluated in Sweden. Firstly, the survey showed that three out of ten graduates are employed in a job, completely matching their education. For those graduates, help from the HEI had been very important; of those who got their first job via contacts from a HEI, twice as many had a job matching their education than those who got a job through other contacts. The contacts from the HEIs were mainly contacts made at a career fairs and other labor market forums provided at the HEIs. Secondly, when it comes to graduates finding jobs in other areas than their education, the contacts though an HEI is not as important, instead staffing companies and public job centers are important facilitators⁹⁵.

3.4. Enhancing the regional learning system – improving the contribution to the labor markets

The regional learning system has been sought improved through two different strategies:

- 1) E-learning
- 2) Adult and continuing learning

⁹⁵ Jusek arbetsmarknadsundersökning 2005. Source: <http://www.jusek.se>.

3.4.1. E-learning

One strategy to enhance the regional learning system has to do with the new communications technologies. During the last few years, more and more initiatives providing education independently of time and place (e-learning) has been launched, as well as a more frequent use of ICT in the courses offered have been found. For instance, KVL has acquired a Learning Management System and hired an expert in e- and adult learning. The ambition is to have fewer lectures where all students are present and instead exploit the existing technology better. Also, KU is presently establishing a “Centre for e-Learning”. At ITU, the concept of “flexible courses” has been introduced, meaning that many courses are offered as E-courses.

Other HEIs have used the Internet to provide courses only available on-line. The students can then take part in the course whenever and wherever it suits them. The Swedish Net University⁹⁶, which is a collaboration between 35 HEIs in Sweden, offers courses to students over the internet, giving many more the opportunity to study. These courses are just like courses at the HEIs admission-free. The HEIs in Øresund SE contributes to the course catalogue with a number of courses: LU for instance, offered 170 courses on-line in 2004.

3.4.2. Adult and Continuing Learning

With regards to adult and continuing learning, most of the HEIs in the Øresund Region offer either tailor-made courses to companies and/or individuals wishing to upgrade their knowledge or whole programmes aimed at professionals. This could be in the form of MBAs, where CBS is offering a choice of 17 programmes, or Master Degrees of continuing education, where KU is offering 13 to choose from. All these examples are offered with a tuition fee.

The Danish universities offer post-graduate courses and programmes and also conduct continuing and life-long learning courses. DB for instance, runs courses for 4-5000 post-graduates every year, and many of these courses are planned in collaboration with the employers. DPU is offering flexible Master-degrees, where students can design their own study programme according to interest and need. Both Karch and DPU offer their post-graduate, continuing and lifelong-learning courses in both Copenhagen and in Århus, the main city of Western Denmark. At KVL, there has been a large growth in the number of programmes offered during the last five years.

In Sweden, education is free for private persons, but companies can buy specific programmes and/or courses for their employees (“uppdragsutbildning”). The market for this type of education is large and expanding in Sweden – in 2003, the HEIs in Sweden had a turnover of 1,1 billion SEK on “uppdragsutbildning”⁹⁷.

In Øresund SE, three of the HEIs (MAh, LU and HKr) participate in a project run by Region Skåne named “The Learning Voyage”. The purpose of the project is contribute to regional development by transferring knowledge from the HEIs into the local communities and thus shortens the distance from the HEIs to citizens and companies. The Swedish Government has also supported the project⁹⁸.

It should be noted that the Swedish system of higher education is modular. This allows for all courses to be offered to students pursuing a university degree as well as students wishing to upgrade their skills or knowledge for professional or personal reasons. In other words, courses can both be offered within regular programmes and as adult and/or continuing learning.

⁹⁶ Source: <http://www.natuniversitetet.se/en>.

⁹⁷ Högskoleverket (2005)

⁹⁸ Source: <http://www.skane.se/templates/Page.aspx?id=18857>

3.5. Conclusions

The overall findings in this chapter have been:

- Øresund Region is attractive for businesses and foreign investments.
- The labor market in the Øresund Region is characterized by a number of high-tech industries, taking advantage of the well-educated population, and a large public sector providing welfare services to the populations. Further, the Danish national administration is mostly located in Copenhagen, Denmark's capital, in the centre of the region
- The industry structure on either side of Øresund is fairly homogenous, which leads to increased interaction and business across the Øresund. Thus, the region is developing into a common market for business.
- There exists no common labor market in the region, but rather two or more different labor markets – one in the Danish and one in Øresund SE. But, due to a number of differences in taxation and legislation, many Danes move to Øresund SE, keep their job in Øresund DK and commute on a daily basis. This number is rising and has contributed to an increasing integration of the housing market. On the other hand, highly specialized workers in the region can now benefit from the increased size of the Øresund labor market.
- Graduates from the Danish universities find employment in Øresund DK. With Copenhagen, Denmark's capital, being located in the region, many graduates wish to stay and work where they studied.
- Graduates from Swedish HEIs face a tough labor market with increasing unemployment for university graduates.
- The HEIs themselves are a major regional employer, and the HEIs are thus a major national investment in the Øresund Region
- The HEIs have used three strategies to widen participation and enhance the regional learning system: recruited students with working-class and non-Danish/non-Swedish background, offered e-learning and offered postgraduate, adult, continuing and life-long education programmes.

3.5.1. Visions and Challenges

The HEIs in the region can – by engaging further in the promotion of life-long learning programmes and courses – be an even more important player in the build-up and exploitation of knowledge in the region. Through alumni work, the universities have the possibilities of creating life-lasting contacts with their students, easing both the transition from university to the labor market and improving the image of the universities in society.

The HEIs should further improve their contacts with labor market organizations to combat unemployment among graduates. Another way of doing this is to encourage even more students than today to do internships, write their thesis with a company and get study-related job experience before graduating. Surveys from Danish HEIs have shown that these are among the factors of importance, when it comes to getting a job after graduation. ØU could very well be an important contributor to the information about the possibilities of the common labor market, facilitating the choice of education as well as the transition into the Øresund labor market.

The HEIs should also encourage more students to start up their own companies. LU is currently offering a course on “innovation and companies”, and the HEIs should in common contribute to the creating of a “spirit of entrepreneurship” among their students.

The HEIs can contribute to the creation of a common labor market in the Øresund Region by contributing to the acknowledgement of professional educations (nurses, teachers) from one country by the other.

In Denmark, many students are employed short term at businesses etc. This allows students to use the skills acquired through their studies, and the businesses benefit from that as well. These jobs provide students with important work experience before entering the post-graduate labor market, often making transition onto the labor market easier. The HEIs in the Øresund could play an important role in mediating these jobs in the region. First, regulatory changes, then the HEIs in Øresund SE can develop a structure for student jobs. Having more SMEs to hire university graduates should be made a priority.

Øresund University should have decision-making competencies. This would tie the 14 HEIs in the region closer together and the links between the regional labor markets on both sides of the Øresund could be strengthened: a common goal of lowering the unemployment for academics could most likely easier be met.

CHAPTER IV: CONTRIBUTION OF RESEARCH TO REGIONAL INNOVATION

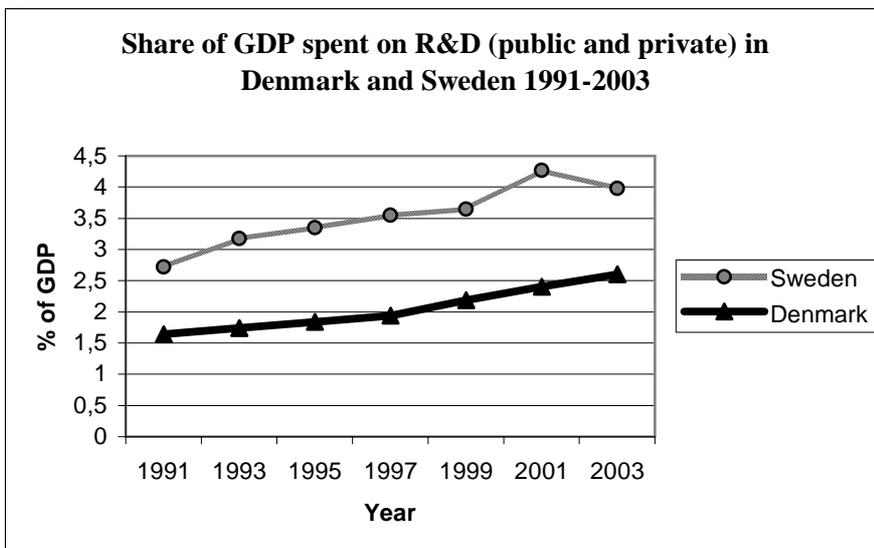
Main findings in this chapter:

- The HEIs in the region contribute to innovation and high-tech entrepreneurship through technology transfer, commercialization of knowledge and collaboration with industry.
- The research in the Øresund Region is top-ranking globally – number 5 in a European comparison
- High local interaction between HEIs, industry and businesses.
- The Swedish system of innovation is better funded and organised compared to the Danish equivalent.
- Due to the large number of actors the innovation system appears somewhat fragmented. Technology transfer offices in the region need further attention and resources in order to engage more heavily in business contacts and innovation milieus.
- It is necessary to improve access to venture capital.

4.1. Overview of the national systems of R&D and innovation

Comparisons of the Danish and Swedish systems of R&D and innovation show that Sweden is performing better than Denmark, both with regards to total expenditure on R&D, but also on public expenditure on R&D. As the figure below shows, the Swedish share of GDP spent on R&D has been significantly higher than Denmark all through the 1990's⁹⁹. It should be noted that the figure includes both public and private spending.

Figure 4.1: Share of GDP spent on R&D (public and private) in Denmark and Sweden 1991-2003



Source: Statistics Sweden, www.scb.se

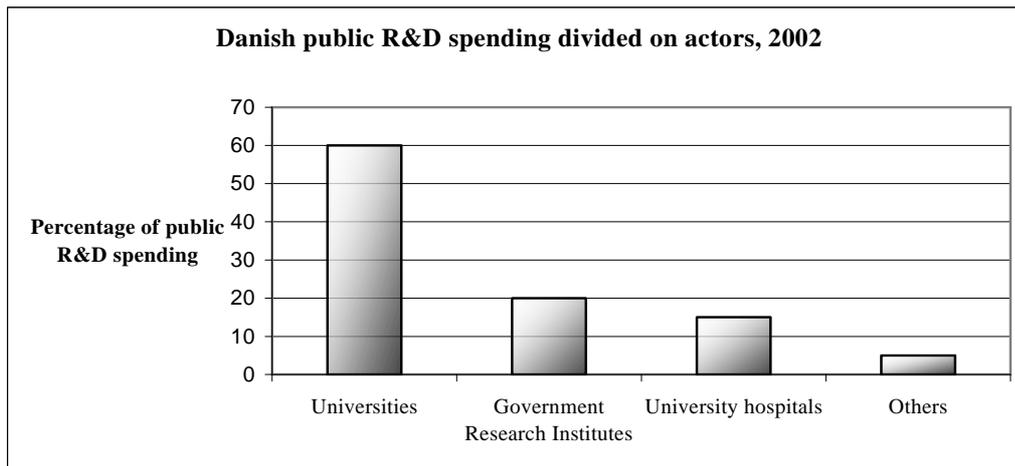
As can be seen in the figure, the total amount spent in Sweden is during the whole period larger than the amount spent in Denmark. This is largely because of two reasons: the first being that private sector spending in Sweden is much higher due to several large multinational companies and, second, that the Swedish R&D within the defense area is much higher than Denmark as the Swedish defense industry is both large and has a long history.

⁹⁹ Data from Statistics Sweden: <http://www.scb.se/statistik/UF/UF0301/2003A01B/BNP%20sv.xls>

4.1.1. The Danish system of R&D and innovation

In Denmark, the public R&D and the innovation system is headed by the Ministry of Science, Technology and Innovation. The public research system¹⁰⁰ consists of universities, Government Research Institutions¹⁰¹ and university hospitals. The 12 universities carry out 60% of the public research, the 22 Government Research Institutions, placed under 9 different ministries, carry out 20% of public research, and the 3 university hospitals carry out 15% of public research. Other actors carry out the remaining 5%.

Figure 4.2: Danish public R&D spending divided on actors in 2002



Source: Denmark's Government (2003): "Knowledge in Growth".

In addition, 11 Authorised Technical Service Institutes (ATSI)¹⁰² – independent, non-profit institutions – provide knowledge to especially SMEs on a commercial basis. The ATSIs play a major role as producers and transmitters of application-oriented and technical knowledge to the Danish industry. Further, there are eight innovation milieus and seven science parks.

Public expenditure¹⁰³ on R&D is in comparison with other European countries relatively low – 0.73% of GDP in 2004¹⁰⁴ - and accounts for some 31% of the total expenditure on R&D in Denmark. In 2003, total public and private expenditure on R&D in Denmark amounted to 4.6 billion Euro, corresponding to 2.58 % of GDP in 2003. This figure is below the 3 % agreed within the European Union. The public sector counted for 1,5 billion Euro or 31% of the total spending on R&D, while the private sector provided the remaining 69 %. More than 25 % of the total private share of investments in R&D came from just two companies, Novo Nordisk and Lundbeck, both large international pharmaceutical companies¹⁰⁵.

¹⁰⁰ OECD (2004b)

¹⁰¹ In Danish: Sektorforskningsinstitutioner

¹⁰² In Danish: Godkendte Teknologiske Serviceinstitutter (GTS)

¹⁰³ The Danish Centre for Studies in Research and Research Policy. Source: <http://www.cfa.au.dk>.

¹⁰⁴ Source: <http://www.rektorkollegiet.dk>. The Danish Center for Studies in Research and Research Policy has calculated public R&D expenditure to account for 0.72% of Denmark's GDP in 2004.

¹⁰⁵ Medicon Valley Academy (2004): 12

Table 4.1: Public and private R&D-spending in Denmark, 2003

Denmark	Amount	Share of total public and private R&D expenditure	Share of GDP
Public spending on R&D, 2003	1.5 billion Euro (11.2 mia DKK)	31%	0.74 % of GDP
Private spending on R&D, 2003	3.45 billion Euro (25.6 mia DKK)	69%	1.84% of GDP

Source: The Danish Centre for Studies in Research and Research Policy, www.cfa.au.dk

In 2004, the Government launched an ambitious plan for a “Future Fund” that should ensure high public investments in high-tech areas as nano- and biotech. The payments to the “Future Fund” should come from the profits on the exploitation on oil and gas in the Danish part of the North Sea and from privatization of one of the two national TV-channels. In 2005, the Government aims at placing 270 million Euro (2 billion DKK) in the fund.

The Danish government has committed itself to meeting the so-called Barcelona goals of spending 3% of GDP on R&D and innovation in 2010, which means an increase in the resources available, is to be expected.

In the last couple of years there has been focus on the strengthening of the interface between the public system of universities, Authorized Technical Service Institutes and incubators/science parks as well as the private industry. In Denmark seven innovation milieus has been established and founded through the Danish Ministry of Science, Technology and Innovation. Together, these milieus have an annual grant of 16 million Euro (120 mill DKK) until 2008 where further financing will be considered. The innovation milieus are together with the science parks considered by the Government to be the “backbone” of commercialization of public research results¹⁰⁶.

A recent study of the Danish innovation system¹⁰⁷ concludes that the Danish performance is relatively low compared to the performances of Germany, Belgium, the Netherlands and Switzerland. Moreover the study concludes that the innovation performance of the different technology transfer offices and science parks differs substantially. Among the top-ranking actors in Denmark are DTU and the surrounding innovation environment, an area we will take a further look upon in the case study section later on in this chapter. Further, a 2003-benchmarking of the Danish innovation system¹⁰⁸ recommends that the Danish national research funds be distributed to fewer actors to create better quality of research – today the research funds are too widely distributed, the report argues.

An analysis from 2004 indicates that Danish incubators and innovation environments have had a crucial importance for bringing ideas into business. More than half of the start-up companies established in the innovation environment or with aid from incubators stated that they would not have existed without this specific support¹⁰⁹. Still, in Denmark the incubators are separated from the Tech-Trans Units as opposed to Sweden and Finland, and this may be part of the reason why those two countries are performing better than Denmark when it comes to commercialization of knowledge, according to an analysis from 2003¹¹⁰. The Danish innovation

¹⁰⁶ Denmark’s Government (2003)

¹⁰⁷ Inside Consulting et al., 2004: Bioteknologisk forskning og innovation. Et benchmark-studie af Danmark, Massachusetts, Stockholm og Hessen, VTU 2004.

¹⁰⁸ Inside Consulting et al, (2003): Et benchmark studie af innovation og innovationspolitik – hvad kan Danmark lære? Økonomi- og Erhvervsministeriets enhed for erhvervsøkonomisk forskning og analyse.

¹⁰⁹ MVA (2004)

¹¹⁰ Inside Consulting et al (2003)

landscape is thus characterized by a number of relatively small units, whereas the best practice countries (Sweden and Finland being the foremost examples) have larger and more professional units because they have developed an overall strategy for the creation of infrastructure for the innovation processes¹¹¹.

In addition to the Ministry of Science, Technology and Innovation a number of other key players are involved in supporting the system. Another important player on the scene is Vækstfonden (the national Danish seed fund). It supports Danish start-ups and young business projects. Seed investments, relative to the total amount of venture investments have been very high in Denmark compared to the rest of Europe. One fifth of all Danish venture investments were in the seed phase in 2003. Investments from Vækstfonden are limited to Denmark, and thus it cannot involve itself in trans border business start-ups. Yet this issue is at present being dealt with in order to allow cross border investments to strengthen innovational ties across Øresund.

Another actor on the innovation organizational scene is the 15 national Business Service Centres¹¹². They provide counseling and information to both smaller existing companies as well as start-ups in different phases. They operate at a regional level.

Technology transfer offices at universities and research institutions

In 2000 new legislation was introduced in order to clarify the rights of university research. The law was based on the same principles as the US Bayh-Doyle Act from 1980. It allows public research institutions (in Denmark universities and hospitals) to claim the commercial rights of research and inventions from their employees. The law requires that researchers report research of commercial interest to their institution. As a result of the law each institution has established technology transfer offices to maintain the management of commercialization of research. The TTO will evaluate invention disclosures, and select commercial interesting ideas for development after intellectual property rights (most often patents) have been secured. The aim being to commercialize the invention as either a license agreement with an existing company or transfer the rights to a new company start-up. Commercial revenues of the invention are shared equally between the researcher, institute and the university, with 1/3 to each. The intense focus on securing patents has been met with criticism as it has taken the focus away from the commercialization of knowledge¹¹³.

TTOs at the universities are – in comparison with other TTOs across Europe – underfunded and understaffed. It is necessary to increase the flow of resources to gain the full advantage of research performed at the universities. At the largest university in the region, KU, only six persons are employed at the TTO. In comparison the large universities around Europe have TTOs with 30-40 employees. The understaffing results in lack of resources to the exploration of research projects with commercial potential. It stands as a central matter to upgrade the TTOs to the increased interplay with business and industry in the outside world. These remarks could account for all TTOs in the region, though it is important to underline that the larger universities have a greater potential of being key players in the innovation field.

4.1.2. The Swedish system of R&D and innovation

In Sweden research and innovation bodies are split between two different ministries, Ministry of Education, Research and Culture and the Ministry of Industry, Employment and Communications.

¹¹¹ Inside Consulting et al (2003)

¹¹² In Danish: Erhvervsservicecentre

¹¹³ For more information: <http://www.techtrans.dk/translate.action?thePage=techtrans.dk&from=da&to=eng> ; Lov nr. 347, 1999: Source: (http://www.videnskabsministeriet.dk/cgi-bin/doc-show.cgi?doc_id=14206).

In 2003, Sweden spent 4.0% of its GDP (total of 10,6 billion Euro / 97 billion SEK)¹¹⁴ on R&D, which is among the highest national R&D expenditure levels in the world. But a very large part of the funding comes from Sweden's largest companies (such as AstraZeneca, Ericsson, Volvo, Saab etc) that account for ¾ of the total sum.

Table 4.2: **Public and private R&D-spending in Sweden, 2003**

Sweden	Amount	Share of total public and private R&D expenditure	Share of GDP
Public spending on R&D, 2003	2.71 billion Euro (24.770 mio SEK)	25.6%	1.0%
Private spending on R&D, 2003	7.89 billion Euro (71.953 mio SEK)	74.4%	3.0%

Source: Statistics Sweden, www.scb.se

Some of the private funds for research are spent at the universities: in 2003, private funded research at the HEIs in Sweden amounted to 1,4 billion SEK / 153 million Euro¹¹⁵. The large amount spent on private sector R&D can to some extent be explained by the Swedish industry structure: Sweden is home to several large, international companies running large research programmes. The so-called "Swedish Paradox" is that in spite of the large sums spent on R&D, it does not create significantly higher growth. R&D takes place in Sweden, but the results are to a large extent put into production in other countries¹¹⁶. A report from Medicon Valley Academy, a network organization for the biotech cluster in the Øresund Region, analyses the setup and gives it a critical view:

"This [the setup] makes the innovation basis very vulnerable, which was demonstrated when Ericsson cut their research spend by almost 50 %. The mergers in big pharma are also regarded as a current threat to research spending. Although AstraZeneca has kept and perhaps even increased R&D spending in Sweden thus far, the former Pharmacia is being gradually reduced in the hands of its new owners Pfizer and General Electric¹¹⁷."

One of the most important key players in the innovation system is VINNOVA (Swedish Agency for Innovation Systems), which was formed in 2001. VINNOVA has a yearly budget of approximately 110 million Euro to co-finance research programs and regional development in close co-operation with the industry. Also VINNOVA finds it problematic that a few very large multinational companies dominate R&D in Sweden.

Another important player in the innovation system is The Innovation Bridge¹¹⁸, a company created by the merging of seven regional foundations – the Technology Bridge Foundations (TBF)¹¹⁹. The TBFs were started at seven universities in the mid 90's in order to promote regional growth through the use of R&D from the HEIs. The TBF in the southern part of Sweden was formed in 1994, and has since contributed to the creation of more than 140 research-based companies. By the end of 2004, the TBF/Innovation Bridge South had invested more than 32 million Euro in a number of different projects (ranging from seed projects to infrastructure and incubators) making it one of the largest innovation actors in the whole Øresund Region. In spite of the criticism of the Swedish dependency on private R&D, Sweden is generally ranked higher than Denmark, when international comparisons are undertaken. Sweden is among the top-spending countries in the world when it

¹¹⁴ Högskoleverket (2005)

¹¹⁵ Högskoleverket (2004c)

¹¹⁶ Source: www.vinnova.se

¹¹⁷ MVA (2004)

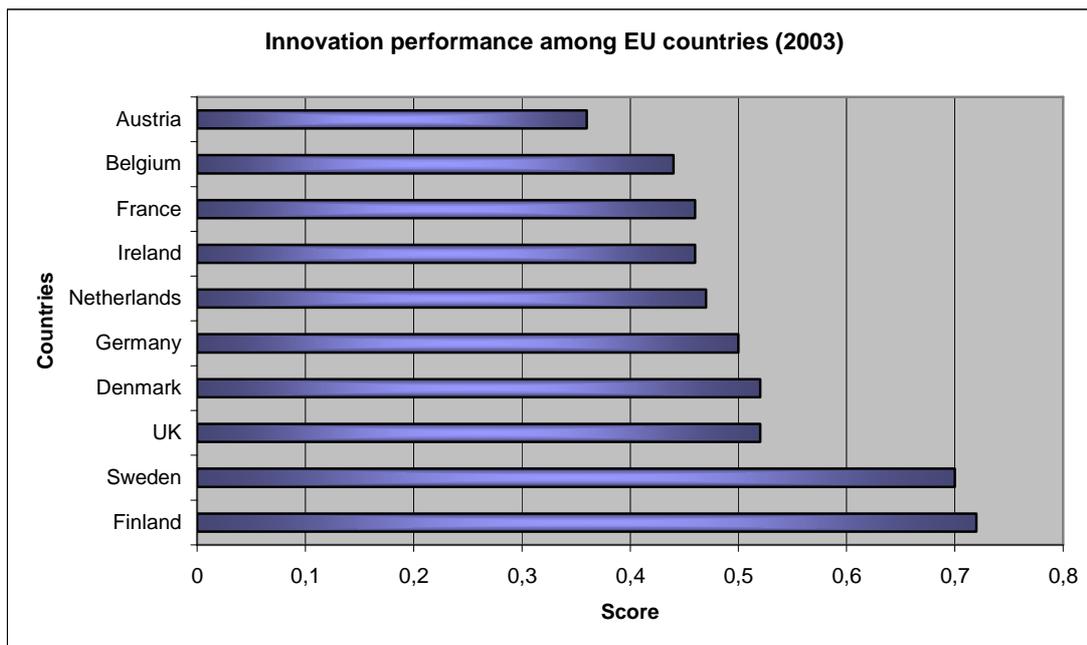
¹¹⁸ In Swedish: Innovationsbron. For further information: www.innovationsbron.se

¹¹⁹ In Swedish: Teknikbrostiftelsen

comes to R&D, and in a benchmarking of the Danish system of R&D and innovation with Sweden and other countries, the structural conditions for the commercialization of research results in Sweden is emphasized as a best practice country because of the large relevance of the public R&D for private companies and the efforts made to transfer the results to the private sector¹²⁰.

In European comparison, Swedish (and Danish as well) innovation performance is high, as this figure shows:

Figure 4.3: **Innovation performance among EU-countries**



Source: *European Innovation Scoreboard, European Commission 2004*

VINNOVA, however, in a benchmarking analysis of the long-term performance of the Swedish innovation system¹²¹ warns that the quality of the Swedish public research is decreasing and that industry-financed research at the universities has decreased in the past years. All in all, VINNOVA fears that Sweden may lose its position as one of the leading countries in the world with respect to R&D and innovation. VINNOVA considers an effective collaboration between researchers/HEIs, companies and public authorities central for any innovation system to function optimally. This triple-helix model is thus the way, VINNOVA recommends for the national innovation system to create development throughout Sweden¹²²

Technology transfer offices in Sweden

Sweden maintains a system where university researchers keep their intellectual property right of inventions and research results. In contrast to Denmark, where the researcher is obliged to disclose inventions and results of commercial interest to the employer, the Swedish system is not regulated as such. The Swedish researcher has no obligations to inform and can freely choose which route to use for technology transfer – if deciding to try commercialization at all.

¹²⁰ Inside Consulting et al (2003)

¹²¹ VINNOVA et al (2004): "The Swedish National Innovation System 1970-2003".

¹²² Source: www.vinnova.se.

In spite of this, the different kinds of technology transfer offices/units that have been set up by Swedish universities recently do play an important role. The TTOs are expected to be on the lookout for new ideas and research results that carry a large potential. From the beginning these offices did not have economic resources to seed and invest in new ideas, and had only few employees. This has changed slightly during the last years, but TTO still lack importance compared to other large key players in the Swedish innovation system.

A number of HEIs in Sweden have formed companies to handle the technology transfer process and these have received governmental funding. This has provided them with the opportunity of attracting private sector people with similar wages as those found in the private sector. In a benchmarking of the Danish innovation system, this recruitment factor is underlined as one of the major differences between Denmark on the one hand, and Sweden and Finland on the other hand. In Sweden, the TTOs have thus had better recruitment opportunities and a more active involvement from the private sector. This leads the authors of the benchmarking to conclude that the technology transfer process is handled more professionally in Sweden (and Finland, for that matter) than Denmark¹²³. In that regard it must be underlined that understaffing and underfunding is not just a problem in Denmark, but in Sweden as well. In the case studies later on in this chapter we will take a closer look at TTOs in Copenhagen and Lund.

Technology incubators

The National Incubator program from 2003 aims at establishing ten incubator environments with 10 start-up companies each. 2.1 million Euro has been set aside for each of the incubators. In addition to that it is important to notice that the present science parks in Sweden are not publicly funded, but based on regional support along with private investments. The TBS offices are often located in these science parks and offer technology transfer and early seeding of start-ups.

A great number of other innovation players characterize the Swedish system as well. This contributes to a certain degree of uncertainty in management and lack of economies of scale. The before mentioned Medicon Valley Academy report argues this way:

“[It] is adamant that the many actors should co-operate and thereby strengthen the chain from invention to commercialization. The university holding companies are to have different tasks than the TBS system, in that the former must work with the very early phase (not necessarily including investments in spin-out companies), while the latter should be able to invest repeatedly without being diluted. [...] Only the TBS organizations presently has the capacity to perform independent project evaluations, e.g. not from the seller’s but from the buyer’s perspective.”¹²⁴

The lack of pre-seed and seed funding is substantial in Sweden due to the large financing from private investors (and their lack of risk-taking). On that behalf a number of public initiatives has been carried out recently and more will follow in the future in order to support start-ups in the initial phases and hence give a larger number of innovators the option of doing business.

Another critical issue is related to the lack of tax reduction. Countries such as UK and France offer young innovative companies tax reductions. This is expected to result in faster product development time and higher commercial viability. The tax reduction scheme makes it attractive to invest in R&D in business start-ups and businesses in their very early phases as in more mature businesses – if all other factors are equal. In Denmark there is a tax reduction for business start-ups and innovation, while no such tax reduction exists in Sweden¹²⁵.

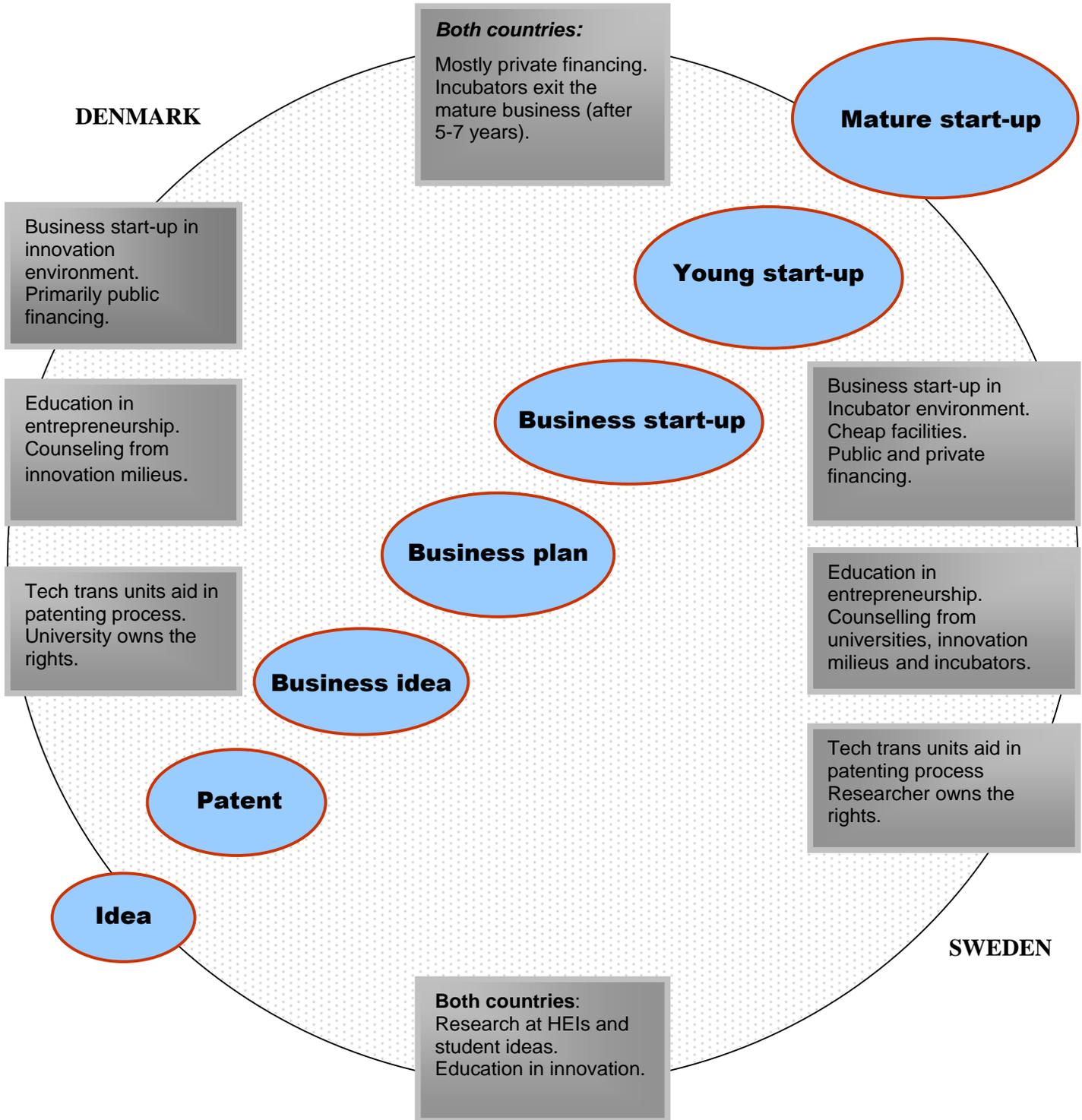
¹²³ Inside Consulting et al (2003)

¹²⁴ Medicon Valley Academy (2004): 17.

¹²⁵ Medicon Valley Academy (2004)

4.1.3. Process of commercialization

In the two countries.



4.2. R&D and Innovation in the Øresund Region

4.2.1 Research in the Øresund Region

As shown in Chapter 2 (section 2.4. International Comparison), the Øresund Region is the 5th largest research center in Europe when measuring publications covered by the Science Citation Index. The universities perform most of the region's research, although a small number of private companies such as the pharmaceutical giant Novo Nordisk publish a very large number of articles as well.

Even though the Øresund Region presently is one of the larger research centers in Europe, the region is likely to face a hard challenge in the future, as the importance of the old industrial centers in North America and Europe are being challenged by the East Asian growth centers in particular. This will – according to Matthiesen et al (2005) – lead to a less centralized picture of research in the world as Asian centers will appear.

Matthiesen et al (2005) has investigated the pattern of co-authorship in the Øresund Region by making a bibliometric analysis. The term “co-authorship” covers articles published by authors belonging to different institutions. Matthiesen et al (2005) find that most co-authoring in the region takes place with international partners. Of these, the vast majority (79%) are from universities from outside the region, whereas the rest is private companies. Co-authorship within the region is to a large extent between universities and private companies (59% of the co-authorships are between universities and private companies). In other words co-operation between companies in the Greater Copenhagen Area and authors from the Greater Copenhagen Area is unexpectedly large. Most of these authors are from the universities. Thus, there exists co-operation between the private companies in the region and the universities to a very large degree.

The conclusion of Matthiesen et al (2005) is that universities and private companies in the Øresund Region interact locally at a high intensity. The universities reach out towards the global flows of knowledge, participating in research and development at the highest level, thus being of major interest to the regional businesses. The universities in the Øresund Region in collaboration with the region's companies are international heavy weighters when measured on scientific output. The region is the largest in that regard in Scandinavia and ranks among the top countries in both Europe as well as globally¹²⁶.

With the ever-increasing specialisation and costs of equipment, there are economies of scale in integrating the research environments across the Øresund. One example of this is the Nano-Technology area, where the major players in the region (Technical University of Denmark, University of Copenhagen, Risø National Laboratory (Denmark) and Lund University work together on creating a cluster for nanotechnology in the region. A network organisation, Nano Øresund, has been created for this purpose. Another example is the bid for the European Spallation Source (see fact box 4.1.).

Fact box 4.1: **European Spallation Source – Scandinavia**

The Øresund Region is also using its combined research resources when applying to be the host of the European Spallation Source. The European Commission has decided to build one spallation source in Europe, and a consortium of Swedish and Danish universities and private companies are working to have the spallation source build in Lund. Most recently, the Swedish Government's special advisor on the issue, mr. Allan Larsson, has recommended the Swedish Government to make a formal bid for the spallation source.

(Source: <http://www.essscandinavia.org/new/source/dokumentation/ESSexecutiveSummaryCorrected-Version6July2005.pdf>)

¹²⁶ Matthiesen et al (2005).

When it comes to funding from the national research councils, the border between the two countries becomes a barrier. It is thus hard for a Danish-Swedish group of scientists to acquire research funds from the Danish or Swedish research councils, as they have different administrative routines and procedures. In a 2004-memorandum from the Øresund University, this is found to be the largest barrier for a more efficient and rational distribution of national research funds¹²⁷. It is adamant for the creation of a joint research area in the Øresund Region that these barriers are removed, and researchers thus have easier access to funding from both Denmark and Sweden.

4.2.2. Innovation in the Øresund Region

As shown in the table below there is the great number of different actors in order to stimulate innovation, the commercialization of research and related areas.

Table 4.3: Innovation players in the Øresund Region

	Denmark	Sweden
<i>Technology transfer offices</i>	DTU, The Patent Office Research and innovation office at The Royal Veterinary and Agricultural University Tech Trans Unit at University of Copenhagen	LU Innovation Malmö University Kristianstad University
	IT-University of Copenhagen, Section for Innovation Copenhagen Business School, Career Centre TechTrans Office, The Danish University of Pharmaceutical Sciences Roskilde University	The Swedish University of Agricultural Sciences (Alnarp)
<i>Other technology transfer offices and actors</i>	Tech Trans office Denmark CrossRoads Copenhagen Biotech Research and Innovation Centre (BRIC) at KU Greenhouse for ICT (IT-væksthuset 5te) at ITU	Teknopol Lund University Technology Group Innovation Skåne
<i>Science parks</i>	CAT Science Park Scion-DTU Symbion Science Park	Technology Bridge Foundation in Lund / The Innovation Bridge. Ideon Science Park Krinova Science Park Medeon Science Park
<i>Innovation milieus</i>	CAT-Symbion Innovation DTU Innovation Teknologisk Innovation	Ideon Innovation Malmö Stad Innovation / MINC Brinova

Source: www.mva.org

Universities in Denmark are required by law to have administrative procedures for claiming IPR to inventions and disclosures and because of that there are more TTOs in the Danish part of the region than in the Swedish part. Also, the Danish side of the Øresund Region holds three of the governmental supported innovation milieus (see section 3.1.1. on the Danish system of R&D and innovation). Two of these are linked to universities in the

¹²⁷ André, N (2004).

region, DTU Innovation and CAT/Symbion (which has close relations to Roskilde University). The last innovation park is *Technological Innovation*. 80 % of the grants from the Ministry of Science, Technology and Innovation are directly invested in new business ideas, while 10 % are used for marketing and PR. The remaining 10 % are used for administration.

In Øresund SE, Lund Innovation A/B, the holding company of Lund University, has received government money (10 mio SEK) as start-up capital. Also non-university actors are present on the innovation and technology transfer scene, for instance the City of Malmö that have started the incubator MINC (Malmö Incubator) and in the years 2007-2011 will support it financially with SEK 3 million / 330,000 Euro. This shows how fragmented the innovation area in the region is: there are many small units, and even though each of them is doing a good piece of work, they still lack the size and funding ability of the greater units seen elsewhere in Europe.

Lund is an important case for innovation as the city is the home for the oldest and largest science park in Scandinavia, Ideon. It was founded in 1983, and today, LU owns 60% of Ideon. All present, moved out, spin-off and supplier companies employ a total of 8,600 people and the connection to the university research system is strong, as about 55% of all Ideon-companies are spin-outs from LU. This has been labeled the “Ideon Phenomenon”¹²⁸. Among the many innovations of Ideon-companies, Ericssons “Bluetooth”-technology, used for mobile phones is perhaps the most well known. When Sweden was hit by recession in 1990’s, the city of Lund managed (as one of the few cities in Sweden) to maintain growth throughout the decade because of the concentration of knowledge-intensive companies¹²⁹.

There is a tendency for the innovation actors in the Øresund Region to focus on the region’s strongholds of today: ICT, biotech- and medico-technology, whereas few specifically target innovations in the industries of tomorrow: nanotechnology is one example and the design sector another on branches with good growth potentials. Having a more diverse portfolio of companies at the different science parks and innovations milieus in the Øresund Region would also create the possibilities of crossover projects and innovation. Interestingly, Designhub – a part of MINC – gives special attention to companies with a large potential within design. This specific focus makes Designhub/MINC unique in the region, and with 1,735 graduates within the design areas every year, there is a huge potential for new start-ups¹³⁰.

The question is of course how big impacts these initiatives have on the various indicators such as economic development and the creation of new jobs. Large investments have taken place, and these should hopefully have measurable effect to some extent. Yet it is difficult to measure whether the overall economic development is an exclusive outcome of these initiatives. As stated by Professor Gunnar Törnqvist from Lund University in an international comparative study it is clear that not even the best planned science parks and incubators may by necessity contribute to important innovation processes in an area:

*“Even in well planned science parks and development centres, it has proved difficult to go beyond the preparatory stages of the actual creative process. The components that one believes to be necessary are gathered together in a small area. What happens next is difficult to determine. To an outsider, it appears to be largely random. Occasionally something interesting happens in this contrived environment. However, often the synergy effects are largely absent i.e. the results are no more than the sum of the parts. Each separate operation could presumably have generated these results without the major investments in the centralised facilities.”*¹³¹

¹²⁸ Malmström (2005)

¹²⁹ Øresundsinstittets Regionrapport (2005)

¹³⁰ Øresund Design (2005)

¹³¹ Törnqvist (2002)

But in his report Törnqvist clearly demonstrates that the Øresund Region – like a few other regions in the world – has a special dynamic potential in this respect.

Another critical issue, which is more regionally orientated, is the fact that many different actors are acting on different scales and levels. This could contribute negatively to distort and blur the options for possible partners, like researchers and high-tech industry. The number of different players in the region indicates that it is a fragmented organisational structure. It could be argued that the large number of actors makes it difficult to form a common strategy and benefit from economies of scale. Yet there have not been ideas of forming cross-border science environments or science parks. The ØSR is the sole organisation forming contacts within the research world across Øresund. ØSR has provided a framework for dialogue and discussion and has brought about a great deal of formal as well as informal contacts in the whole region. This has had a positive influence on the development, but further integration will be necessary in order to take advantage of the competencies found on both sides of the Øresund.

The potentials for a joint Øresund “research and innovation” area are high. As the following table shows, the total expenditure on R&D in the region as well as the number of employees within the sector places the region above other northern European regions such as Stockholm, Berlin and Amsterdam.

Table 4.4: R&D in the public and private sector in selected regions in Europe

Region	Private R&D		Public R&D	
	Employment	Costs (mio. DKK / mio Euro)	Employment	Costs (mio. DKK / mio Euro)
Øresund Region	27,543	2,394 / 322,2	21,635	4,761 / 640,7
Stockholm	16,611	2,483 / 334,2	15,785	4,294 / 577,9
Helsinki	15,292	1,175 / 158,1	14,526	N/A
Berlin	14,554	1,188 / 159,9	23,182	N/A
Hamburg	8,427	788 / 106,0	8,096	2,841 / 382,3
Amsterdam	6,820	519 / 69,8	N/A	N/A

Source: Danish Ministry of Economic and Business Affairs, 2003

But, these figures are simple aggregation of the Danish and the Swedish parts of the region – as such, no regional system for R&D and innovation exists in the Øresund. In a few business areas, biotech and life sciences, investors look on both sides of the Øresund, but to make this the general situation would require a national initiative to foster cross border venture capital.

There are a number of obstacles to overcome before the innovation system in the region is fully integrated and thus performing most optimal. The obstacles all have to do with the cross-border nature of the region:

- Cross-border financing of research needs to be simpler. This would allow for a rational and more efficient use of the national research funds in both countries, as consortia of Danish and Swedish researcher taking advantage of complementary competencies could apply for the funds available. As stated above, a 2004-working paper from the Øresund University identifies the obstacles in receiving joint Danish and Swedish funding for research as a major barrier to the integration of the research systems in the Øresund Region.
- The Danish national seed fund (“Vækstfonden”), one of the major sources of venture capital in the early

stages in Denmark, can at the moment (yet this is about to change) only invest in Danish companies. Thus, Swedish start-ups cannot raise capital from one of the major Danish investors. The region is thus effectively split in a Danish and a Swedish part leading to suboptimal outcome.

- Start-ups in the Swedish part of the region to a large extent raise capital from investors in Stockholm¹³². This orientation to the north rather than the west is a major obstacle for the creation of a regional innovation system. Increased information about the Danish venture capital market and the start-ups in Skåne could improve this situation. By strengthening the Øresund Science Region the organisation could provide both sides with more information and knowledge and act as a strong regional organisation politically. This being said, several of the platforms in Øresund Science Region already today publish “Financing Guides” where start-up companies can get information about potential investors to contact.

Also, it is striking to see that the innovation system is still very much oriented towards the industry of the day: most incubators and science parks in the region focus in IT and biotech, which of course is rational due to the region’s particular strength in that area, but as the region (as we will show in Chapter 5) is also very strong within design, digital media, the service sector and other leisure economy-related areas, one would expect to find innovation milieus and science parks aimed at these particular groups. These do however, except for Designhub at MINC, not exist in the region. Further co-operation and co-ordinating on a regional level should thus lead to a focused effort on commercialising the knowledge and ideas found in these specific sectors of society.

4.3. Øresund Science Region

The Øresund Science Region (ØSR) is the prime example in the Øresund Region on the engagement of the HEIs in cross border regional development. ØSR, started by Øresund University in 2001¹³³, brings top-level business sector people together with top-level regional politicians and HEIs in order to create the best possible conditions for regional, knowledge-based growth. Today, the organisation is an important facilitator in the difficult task of bringing together the universities, businesses and public actors of the region. As such, ØSR operates as a triple-helix organisation precisely as VINNOVA, the Swedish National Agency for Innovation, recommends with an extra twist: it brings together industry, government and HEIs from two countries in a sort of “double triple helix network”. The cross border feature is what distinguishes ØSR from other players on the innovation scene in the Øresund Region, and is the *raison d’être* of the organisation.

The aim of Øresund Science Region is

*“To stimulate the process towards developing a knowledge-based economic growth spiral in the region, because we will see over the next decade or two that the build-up, transfer and commercialisation of knowledge will become one of the most important economic growth factors in an ever more competitive world.”*¹³⁴

Here, there is a clear reference to the “Knowledge Economy” and to the original vision for the Øresund Region. As such, ØSR shows the involvement of a number of regional stakeholders in a concerted effort to contribute to the development of the region’s economy.

In the daily running of the ØSR five main aims are central. The first one is to develop core competencies within

¹³² Interview with Anders Olshov, Managing Director, Øresund Institute.

¹³³ The ØSR was financed 2001-2004 through the European Union’s Interreg IIIA project. The Interreg projects focus on the development of European border regions. Interreg IIIA was launched with the perspective of turning the Øresund Region into a well-integrated and functional cross-border region. Interreg IIIA runs from 2000-2006 and the European Union has granted €31.26 mill to co-finance projects in the Øresund Region.

¹³⁴ Source: <http://www.oresundscienceregion.org>

research clusters in close collaboration with business and industry. Second, ØSR supports the development of innovation parks and incubators. Third, ØSR contributes to the visualization of the region's aggregated competencies. The fourth aim is related to the establishment and on-going development of viable structures for the platforms, while the fifth and last is related to the development of collaboration between the platforms¹³⁵

Within a number of identified core competencies, so-called platforms have been established to create linkages and contacts within industry, HEIs and authorities. The first of the today nine platforms that came into existence was the Medicon Valley Academy (MVA) in 1997. It started as an Interreg IIA-project to establish collaboration between the biotech and life sciences industry of the region with university hospitals and HEIs. MVA is today a member-financed organization – no longer a part of the Interreg-programme. MVA worked and still continues today to improve the conditions for science and knowledge production, technology transfer, innovation and the preconditions for enterprises to exploit this knowledge. The success of the MVA led to the planning of more platforms in 2000. These were finally established in 2001 when the IT, Food and Environment platforms came to see the day. To the ØU it was obvious that a coordinating body was needed in order to keep track of the platforms and stimulate synergism between the different areas. On initiative from ØU, the ØSR was established later in 2001 as an umbrella organisation covering the (then) four platforms. ØSR was also funded through the Interreg IIIA programme for the period of 2001-2004.

As the following quote from the 2003 OECD Territorial Review indicates, the Øresund Science Region (which did exist at that time, but has grown in size and importance since) is a much-needed player in the regional capacity building:

“However, despite their proximity, the Danish and Swedish parts of the region are relatively insulated from each other and face the same formidable barriers to the promotion of networking – legal, cultural, institutional – that existed before the creation of the fixed link. How long will it take, then, for the full potential of cross-border synergy to begin to materialize spontaneously? [...] In fact, many people, businesses and organisations may remain locked in their national and linguistic context, and close spatial proximity. Without active channels for business transaction, dialogue and communication, even a critical mass of related firms may under-exploit the large potential it has. Consequently, action is required to accelerate the promotion of cross-border networking and ensure that the time required to learn and innovate in Øresund eclipses the lower value added strategy of copying products and processes from other regions.”¹³⁶

The ØSR was evaluated in 2004 and the conclusion is overall positive of the on-going work within the platforms and the umbrella organization:

“Important processes has been initiated which should empirically lead to a successful result in shape of economic growth. That is the main result. The economic development in the Øresund Region is better than the rest of Denmark and Sweden. The business networking across Øresund is on the rise. Unfortunately it is not possible to proof the causality between the founding of ØSR and platforms and the successful results [...] Four (six today) platforms has been established, business and universities have been mobilized to a great extent and a great deal of networking has taken place [...] The Øresund Science Region and the platforms have attracted a great deal of international attention, which can be seen as a sign of the projects pioneering status.”¹³⁷

¹³⁵ Evaluation of ØSR, February 2004.

¹³⁶ OECD (2003): 124.

¹³⁷ Evaluation of ØSR, February 2004.

Factbox 4.2: Chronology of the Øresund organisations described in this chapter

1996: The idea of the Medicon Valley (MVA) was conceived by universities and industry. The committee of collaboration between University of Copenhagen and Lund University was founded (SULK).

1997: The work of SULK leads to a more formalized co-operation, which later that year resulted in the Øresund University. The MVA is established as a 3-year Interreg-programme (50% EU, 50% universities)

1998: The Øresund University and the Øresund Business Council initiates the work of expressing a joint strategy of regional research and development.

1999: “Research Strategy Øresund” is composed and implemented. The strategy describes the regional areas of knowledge-based growth potential and gives recommendations to further development of the areas mentioned in the report.

2000: Interreg ends for MVA. The success of the project leads to a new organization, where the members hold the costs. Three new platforms are planned: Øresund Food Network, Øresund IT Academy and Øresund Environment Academy.

2001: The planning of the Øresund Science Region begins.

2002: The Øresund Science Region is established by The Øresund University.

2002: The Øresund Science Region and the three new platforms are secured with financing from the European Union and the Danish and Swedish governments.

2003: Two new platforms are founded: the Øresund Design and Øresund Logistics.

2005: Three new platforms are accepted: Nano Øresund, DigiNet and the Humanities Platform.

Lately, ØSR has established an Innovation Group. The Innovation group is supposed to develop the contacts with the regional innovation actors and – presumably – take some form of co-ordinating role vis-à-vis regional and national politicians. Furthermore, ØSR is considering the possibilities of exporting research results, something that is not yet very common in the region. In addition ØSR ought to perform a strategic analysis of its surroundings to direct its efforts more precisely.

Finally, the two governments and the two regional authorities are working with the universities in the region to establish an “Academy for Entrepreneurial Studies” in the region, bringing researchers, students and entrepreneurs together under the same roof. Should this Academy come into existence, it would be one of the largest in Northern Europe and provide significant input to the current debate in the region about how to increase the innovation in the region. Further, it would have a major impact on the labor market of university graduates, as more are expected to start up their own company.

ØSR is today financed through different interested parties. Among the largest are ØU, the Danish Ministry of Economic and Business Affairs and Region Skåne. Also the Greater Copenhagen Authority, the Swedish Government and businesses (through membership fees) contribute to the financing of ØSR¹³⁸.

4.3.1. The platforms of Øresund Science Region

As stated in the excerpt from the evaluation above the work of the platforms has been viewed upon as quite pioneering. The role of the platforms (to be a linkage between many different involved parties in innovation and

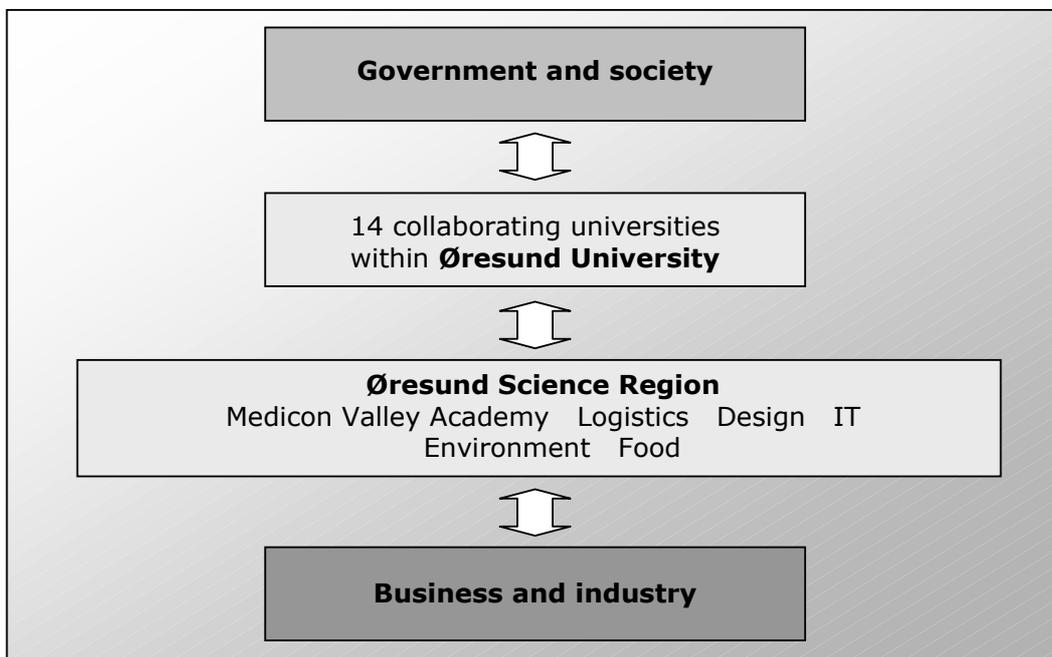
¹³⁸ Other larger co-financers are the City of Malmø, Sparbanken Finn, Vinnova and Näringslivsdepartementet. The number of businesses contributing through membership fees is above 1,000.

technology transfer) has previously been described in terms of light institutionalization in the OECD territorial review from 2003¹³⁹. The fundamental idea of these platforms is to create synergism between actors in the region. This is done through a series of related tasks. Several of the platforms collaborate with the innovation parks and incubators in the region. The platforms do not invest in new ideas themselves, but secure and develop an innovative environment and efficient commercialisation structure. In addition to this they promote different kinds of integration: disciplines, academia, industry, the public sector, Øresund and other regions in the world. To sum up the main aim could in short be: To stimulate new knowledge in areas where the Øresund Region is competitive on a European as well as global scale.

The platforms all work as non-profit, networking organisations and all share a common goal to bring together researchers with companies and the relevant authorities. Further, cross-disciplinary projects are also undertaken. Among the cross-border activities launched by the platforms and ØSR is the “Bio+IT-project”, bringing the platforms Medicon Valley Academy and Øresund IT Academy together. A project on the way is “The Intelligent Hospital” also combining the strengths of MVA and ØIA. A third project to mention could be the “Food vs. Drugs”-initiative.

The platforms have a very visible connection with the cluster concept. They share a belief that not only competition, but also co-operation and information sharing between the companies in the specific branch of industry in the region will result in growth possibilities and regional development. The figure below sums up the whole setup of the Øresund Science Region, the related platforms, ØU and the innovation systems of the region as seen from the perspective of the platforms:

Figure 4.4: Overview of the organisation of Øresund organisations related to the HEIs



In the centre of the figure, the nine platforms are located. They work with HEIs, industry and businesses. The platforms are assembled within the ØSR with a board consisting of members from HEIs, industry and

¹³⁹ OECD (2003)

authorities. ØSR has both a co-ordinating role and launches inter- and cross-disciplinary projects.

It is however important to bear in mind that the platforms and the clusters of industry and businesses they represent are not the only kinds of business found in the region. In particular and despite these relative strengths, a large part of the economy is still based on more traditional, low-tech industries. The region has prominent advantages within the platforms business areas, but many traditional industrial areas do still contribute on a large scale to the economy of the region.

All platforms are described in appendix in the back of the report. In the following sector 4.4. Case Studies, the report will investigate Medicon Valley Academy (MVA)'s activities.

4.4. Case studies

In the following part of the chapter we will analyze three different initiatives, which give a thorough view on how HEIs have met the challenges related to the increased focus on R&D and the collaboration with different actors within the region.

For the case studies we have chosen key players from the different categories in section 3.2.2. From the Tech Trans-category we have picked out LU Innovation. From the innovation environments we will take a closer look on DTU innovation. These important players have close collaborations with some of the science parks mentioned above and therefore they will be included in the description as well. Finally, the report also looks more closely on Medicon Valley Academy. The three case studies each represent different approaches on how to deal with R&D and innovation. The case studies emphasize how HEIs deal with commercialization of different research areas and the way they deal with the R&D challenges vary.

4.4.1. LU Innovation

LU is Sweden's largest, public institution of research with a yearly research budget of around 3 billion SEK. If private research institutions are included LU drops to a ranking as number seven. This position – as one of the leading places for R&D and innovation in Sweden – has made LU attractive to both investors, innovators and public organizations that support the latter.

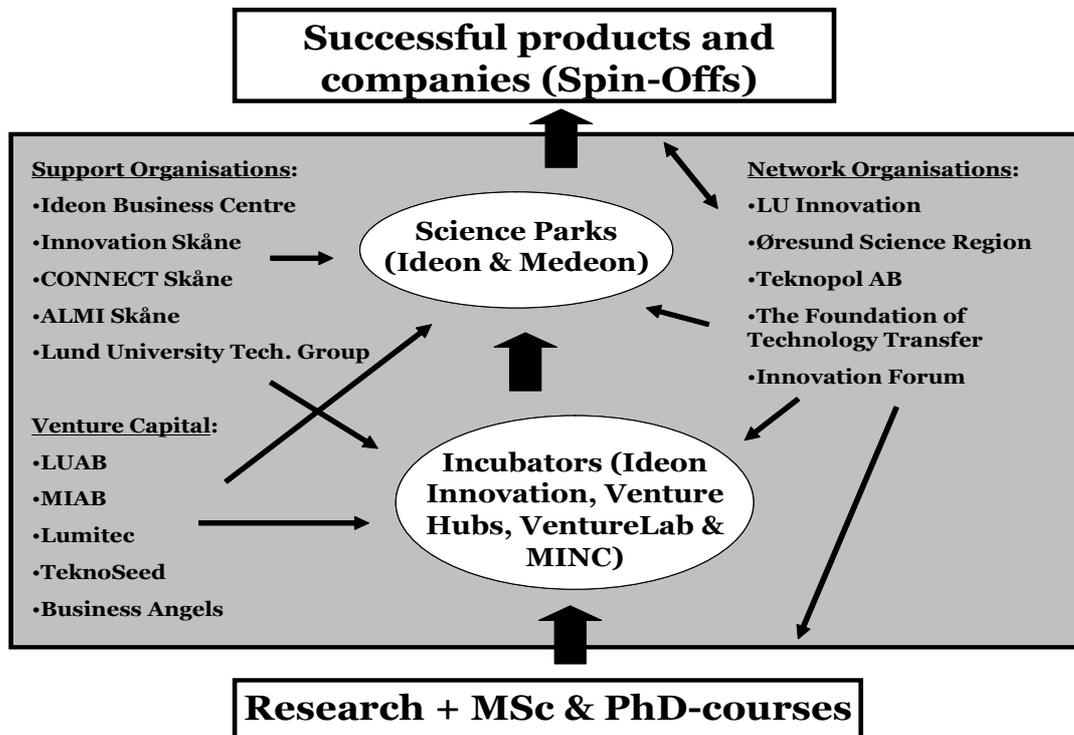
LU Innovation is a part of the Swedish innovation system and is basically a tech trans unit (LU Innovation is presented as Technology Transfer Office of Lund University on the English part of the homepage). There are three different aims: 1) to stimulate innovators and ideas. 2) To scout for new ideas and research results with a commercial perspective. And finally 3) to support start-up businesses. The organization does not have the financial means to invest in projects themselves (only a limited figure of around 100,000 SEK pr. project), but has good contacts and co-operation with business investors – both public and private in the area.

LU Innovation has several different important roles, which can be seen below. Nearly 40 other actors are playing a part on the tech-trans and innovation scene in Lund, which makes the whole scene quite fragmented. At the moment co-operation between these different organizations and institutions could be improved, and it is believed that a streamlining of the efforts and closer collaboration on a great deal of the innovation matters will lead to increased success. The managing director of LU Innovation believes that closer and better co-operation can turn LU and the supporting environments and institutions into one of the best innovation environments in Sweden.

In a 2005 report¹⁴⁰, the innovation system of Lund is depicted this way:

¹⁴⁰ Malmström (2005)

Figure 4.5: Innovation system in Lund



As the diagram shows, there are many actors present in the Lund innovation system. LU Innovation is found in the upper right corner.

There are three main arguments for the establishing of LU Innovation:

- Regional economic development
- Economic outcome to the university
- Social benefit

LU Innovation employs 12 persons with experience from the field of innovation. The number is not especially high compared to other countries' TTUs, and limits the number of projects that can be supported. From the beginning of the fall semester of 2005, LU Innovation takes on the coordination of courses at LU in innovation and entrepreneurship. A great deal of attention has been paid to this area and 35 million SEK will be spent on teaching students and researchers in this field from 2005-2010.

The organization matches Business Angels¹⁴¹ with businesses in the initial phases of start-up. Many of these innovators have received investments from their business angels. Having a personal contact within the investment environment is regarded as a good opportunity to the innovators and it has proved to be successful to

¹⁴¹ A network of people with knowledge on entrepreneurship and business innovation. The Business Angels is regionally divided in Sweden and the division in Skåne has around 100 members. They usually hold a great deal of financial means in order to invest.

a large extent. One of the main problems in Sweden is to locate venture capital that dares to support during the very first phases of business establishment.

During 2004 a total of 13 new start-ups was established with aid from LU Innovation. They can however not support new start-ups with seed money, but has good co-operation with a number of the actors in Lund (e.g. the TBF institutions) that can support the start-ups with financial support. LU AB is one of the most important collaborators; the holding company that can (with public funding) invest in new ideas. Typical LU AB invests in biotech and technical business ideas (45% each), while the remaining supported ideas are within other research areas. LU AB and LU Innovation wish to strengthen the ties to the other side of Øresund. On that behalf there has been a couple of meetings between representatives from the mentioned institutions above, as well as with personnel from the CTTC consortium in Copenhagen.

LU AB estimates that approximately five out of their portfolio of close to 40 business start-ups can be turned into business with positive revenue when they are sold.

4.4.2. DTU Innovation – case study

The Technical University of Denmark (DTU) has since 1829 been the home of some of the most technological advanced research in Northern Europe. Engineering is the primary education, but in recent years there have been an increased number of educations related to biotech and communication. Having the challenges of globalization in mind DTU formed the DTU Innovation, a venture company that assists researchers in becoming entrepreneurs.

The main aim of DTU Innovation is basically about bringing the right people together at the right time.. Joining hands within DTU Innovation means teaming up investors, innovators and people with knowledge on entrepreneurship and business management like the team of supporting Business Angels. DTU Innovation supplies ideas from both the universities own researchers and students along with people outside the university. Approximately one third of the ideas that are to be commercialized have their origin from within DTU itself, while the remaining emerges from researchers, doctors and other innovators in the primarily Greater Copenhagen Area.

DTU is involved through the whole process of creating and maintaining new business ideas. They are always represented in the start-up businesses board, where they own a share of 10% of the total company.

DTU Innovation is housed on the premises of the university. In the far end of the DTU a complete innovation environment has been established, where DTU Innovation is one of the key players. The innovation environment services new businesses with meeting rooms; cantina and other shared physical facilities. Alongside a number of more business related options can be utilized by the innovators. The start-up businesses can on that account be assisted with account management and wholesale deals. Nevertheless the most important asset of DTU Innovation and the innovation environment surrounding is the possibility of financing start-up businesses. DTU Innovation and their different partners within the high-tech innovation area hold a relatively large pool of economic resources for funding. The total value of the DTU Innovation portfolio is 11 million Euro (85 million DKK), which limits the maximum investment in a single project to around 700,000 Euro / 5-6 million DKK. This relatively high level of seed funding creates good opportunities for a greater number of innovators than seen earlier in a Danish context. At the same time it creates independence from external investors and gives the opportunity of starting up business to those who do not possess a commercial idea packed and ready.

Initially DTU Innovation began its activities in 1998. The relatively short period of time from the launch until today means that the investments have not created spin-off in terms of huge economic successes. DTU Innovation states that investments in start-up businesses have a long time frame. The seven years that has passed since the start-up of the innovation milieu has emphasized that a great deal of potential lies within the idea of

DTU Innovation, but still no large-scale successes in economic terms have evolved.

DTU Innovation has three main stakeholders. DTU is the formal owner of DTU Innovation and owns 100%. The Danish Ministry of Science, Technology and Innovation finances the activities to a large extent through the funding described above. As the stakeholder a number of large Danish businesses can be found. They do not finance the activities of DTU Innovation but funds the start-up businesses.

DTU Innovation has joined forces with the science park Symbion and created a seed-fund. This seed-fund is seen as a way of increasing benefit from investments made at early stages. Most often large investors rapidly are attracted to good business ideas whereas DTU Innovation usually ends up with only a small share of the total company hence its limited economic resources. By joining forces it is believed that a greater economic output can be made, when the owners sell their share of a mature start-up. The aim of the seed-fund is to support ideas in the first phases on the way to become real businesses. Usually there are three phases in a business start-up. The first is the pre-seed phase (capital demand app. 1 mill DKK), seed (capital demand 2-5 mill DKK) and venture (capital demand 10-25 mill DKK).

For every ten new start-ups there is a limited rate of success. Three never make it further than testing the idea and plan a little. Out of the remaining seven approximately four will quickly end up as businesses with a limited possibility of growth and potential. The business type is often what can be described as a high-tech service provider, which carry out tasks for larger companies and thereby does not aim at turning their own ideas into profitable business. Left are three start-ups whereas two in the long run will end up as small companies, either with their own ideas as primary focus or as high-tech service providers. One single start-up will ultimately become successful and give revenue to DTU Innovation. Investing in new ideas and technology is, as stated by DTU Innovation, a very uncertain business, and it is hard to believe that it will give a revenue within the next five or ten years. In spite of that the large investments made at the DTU premises indicates that this area is highly profiled and will gain further attention in the years to come at DTU.

4.4.3. *Medicon Valley Academy – case study*

Medicon Valley Academy (MVA) is a member financed network organisation within the biotech and life science area in the Øresund Region. MVA is also a member of Øresund Science Region. MVA works to improve the conditions for science and knowledge production, technology transfer and innovation for biotech businesses in the *Medicon Valley*-area found in the Øresund Region. Furthermore MVA uses some of its resources in order to promote and visualize the potential of activities in both Sweden and Denmark as well as internationally. All these activities are aimed at the so-called Medicon Valley. In the following we will give a further look into Medicon Valley Academy.

The importance of the Medicon Valley is underlined by several scientific investigations. An example:

“Research in the fields of clinical medicine, bio-medicine, biology, biochemistry, biotechnology, ecology and environmental technology are often presented as areas of special competence in the Øresund area. Approximately 60 per cent of the entire pharmaceutical industry in the Nordic countries is located in the Øresund Region.” (Törnquist, 2002: 159)

Within science, Sweden and Denmark are among the leading nations in the world. Measured in scientific output per 1 mio. inhabitants Denmark and Sweden are in the world's top 6 within the life sciences, so it makes good sense to talk of a Medicon Valley.

Compared to other European regions, Medicon Valley holds a very strong scientific position:

Figure 4.6: **Research strength in number of published scientific papers**

Field of science	Medicon Valley's European rank
All Sciences	6
Biomedicine	3
Biotechnology and applies microbiology	4
Immunologi	4
Nutrition and dietetics	4

Source: Matthiesen, C. W. and A. W. Schwarz (1999)

The idea for Medicon Valley originates not surprisingly in the Silicon Valley-area found in California, USA. As known worldwide Silicon Valley is home to a large number of companies within IT and related businesses. In Silicon Valley the synergic effect of a cluster of IT-companies has proven to be of great importance. Silicon Valley attracts the best and most skilful employees – and even though they might shift between different companies their skills and knowledge remains within the region. At the same time there is a large share of knowledge, innovations etc. In the Øresund Region the same potential was seen in the beginning of the 1990's between actors in the biotech and life science branches. Universities, public and private actors decided to establish an organisation whose main goal was to create the same synergetic effects among the large share of biotech companies in the region. The aim since the take-off has been that Medicon Valley should become the most attractive bioregion in Europe by 2005. And even though it is a high-reaching goal to reach, Medicon Valley today places itself among the three largest and important bioregions in Europe. The other two are Paris and London/Cambridge/Oxford.

This position emphasizes that the Medicon Valley has a huge potential of growing even bigger and be a key-player in a worldwide perspective among American and Asian companies and investors. This stronghold has in the last 5-10 years been further enhanced with the establishment of a number of new science parks that complement the already existing. In total there is today 7 science parks in the Medicon Valley. In addition a total number of 26 hospitals are found. Of these, 11 are university hospitals carrying out research.

Medicon Valley Academy commenced in 1997 as an EU Intereg II project. The very first and more informal discussions, however, started as far back as 1990-92. The primary initiators were the universities in Lund and Copenhagen. After the first three-year period, all project objectives were achieved, among those the creation of a network of stakeholders across the Øresund and across sectors, public authorities, hospitals, companies and universities. The success of MVA gave birth to a whole number of network organisations within the Øresund Region. All of these organisations are today assembled in the Øresund Science Region.

Today, MVA's members include all the relevant university departments, healthcare organisations, and most of the biotech and meditech related companies and other organisations located in the Medicon Valley region. MVA has from the beginning been a not-for-profit organisation and managed by a Board of Directors. Today the organisation has proven to be one of the most successful spin-offs of the collaboration in the Øresund Region. MVA has a little more than 250 members, all within the areas mentioned above.

Geographically the Medicon Valley does not comprise the whole of the Øresund Region. Medicon Valley is largely encompassed within the Copenhagen-Malmö-Lund axis. The most (and largest) bio- and meditech

companies are found in Øresund DK, though. This is largely due to the ‘capital’-effect of Copenhagen: A great number of one-of-a-kind HEIs are found here and Copenhagen itself attracts a great deal of people educated and related to the bio- and meditech field. In Øresund SE a number of companies can be found, mostly around Lund University, where a number of large companies in this field are found. Traditionally Lund University is the only HEI in Øresund SE that has performed research and education within the field. The total number of bio- and meditech and pharmaceutical companies found in the region is around 340. 200 of these companies have R&D activities. In total the region has 5,000 life science researchers.

The activities of MVA

Medicon Valley Academy has from its beginning put a lot of effort into forming a strong network and creating a database of contacts in the Øresund Region. The aim is to get hold of key-players within the academia, the public health system, and the meditech and biotech related industries. The organisation works on a day-to-day basis to promote the necessary interaction between these players and the political environment as well as publicising the region. MVA furthermore strengthens network creation and knowledge transfer amongst Medicon Valley's players through the following activities: interdisciplinary and specific networks, regional and international marketing of Medicon Valley and collaborations with other bioregions. MVA works both regionally and nationally to strengthen contacts and partnerships with opinion leaders and political decision makers. In addition, MVA has initiated a range of working groups to analyse regional competences within specific subject areas. The organisation also organises various information and contact events for members of the association and contributes to the regional and international marketing of Medicon Valley. The organisation has in addition tried to influence the development and opinions of decision-makers regionally and nationally through comparison with international best practice, as well as via strategic communication.

Looking apart from the day-to-day activities MVA also has some larger on-going projects and aims. MVA hold a great deal of conferences and seminars and thus strengthening the ties in the region by linking people from different branches and parts of the region together.

The seminars and conferences arranged by MVA are diverse and reach from a *journalist seminar* with focus on stem cells and what the perspectives are in the future to a seminar orientated towards professionals such as *the biostatistics network course*, which gave knowledge on clinical trial simulation in drug development. Furthermore MVA initiates and coordinates projects associated with educational activities in the region.

MVA has many international contacts and often participates in conferences and seminars in Europe, Asia and alike in order to gain information on the global trends.

4.5. Conclusions

In this chapter we have analysed and discussed various initiatives such as Øresund Science Region and the affiliated platforms, the Øresund R&D and innovation system and a number of technology transfer issues.

The main findings of the chapter are:

- Public spending on R&D in Denmark is below the government's own target. At present, only 0.73% of GDP is spent on public R&D, a figure that will have to increase considerably for Denmark to be able to meet the so-called Barcelona goals. At present, private spending on R&D equals 1.84% of Denmark's GDP
- The Danish innovation system is underperforming compared to Sweden. Danish legislation on the commercial rights of public research is catching up with developments in the Anglo-Saxon world, and today all HEIs have Technology Transfer Units.
- Swedish spending on R&D (public and private) is among the highest in the world (4.0% of GDP in 2003), but Sweden is vulnerable as a few very large multinational companies dominate the scene. Further, it seems paradoxical that the high investment in R&D does not result in more growth in the knowledge-based sectors. The Swedish innovation system is much better structured and nurtured than the Danish, and Swedish performance in this area is very high.
- Matthiesen et al (2005) concludes that the HEIs and private companies in the Øresund Region interact locally at a very high level. The HEIs reach out towards the global flows of knowledge, participating in research and development at the highest level, thus being of major interest to the regional businesses. The HEIs in the Øresund Region in collaboration with the region's companies are international heavy weighters when measured on scientific output. The region is the largest in that regard in Scandinavia and ranks among the top research regions in Europe as well as globally¹⁴².
- The Øresund Region has a huge potential as a hub for R&D if the two national systems worked better together. At present, the research funding and venture capital system is not working well together across the border.
- The innovation systems in the region very much focuses on the industry of today. The region should also take advantage of the competencies found within areas such as nano-technology, digital media and entertainment, as there are huge potentials in these branches of industry.
- The Øresund Science Region is a major step in the direction of creating a better functioning cross-border region. By bringing together top-level politicians and business people with the HEIs the organisation is able to foster crossborder collaboration and create the much-needed networks between different sectors of society. Further, Øresund Science Region seems to be the right vehicle for the commercial exploitation of the region's knowledge in the growing markets of South East and East Asia.
- The tech trans offices are under funded and understaffed. In order to gain better results from the research taking place at the universities there needs to be an increased focus on commercializing the research results. In that context the TTOs play a central role as glue between the universities and the outside world.

4.5.1. Visions and challenges

As the two governments heavily influence the R&D and innovation systems, most of the visions and challenges on this area relates to governmental action:

- Improve access to venture capital. Both in the region as such, but specifically to cross-border initiatives. With the present situation, where investors mainly focus on the one side, the full potentials of the region as an innovation centre is not realised.

¹⁴² Matthiesen et al (2005).

- Increase information about the system on the other side. Increased information will remove some of the barriers, SME's and venture capitalists meet today when trying to be active on the other side of Øresund.
- The two states should quickly solve the cross-border research funding problem. This would allow for a more rational and efficient use of the national research funds in both countries, as consortia of Danish and Swedish researchers taking advantage of complementary competencies could apply for the funds available. Further, crossborder research funding would also alleviate a problem for both the Danish and Swedish research policy – that resources are spread out too thinly. A larger concentration to the Øresund Region would result in better quality of research.
- The Swedish Government should – in collaboration with the Danish government – actively work for attracting the ESS to Lund. This would be a major boost to the science environments of both Lund in particular and the Øresund Region in general.
- The two governments should realise the importance of the work, Øresund Science Region is doing, and also that the organisation is basically under-funded. With more capital – in particular with no strings attached – the organisation could do much better and thus improve the overall conditions for knowledge-based economic development.

In the Øresund Region relevant actors still have some action to undertake:

- By teaching students about innovation and entrepreneurship, the HEIs could contribute to an increased interest about this in the region. The students need these skills when they after graduation wish to start their own company. Establishing an “Academy for Entrepreneurial Studies” could be a start.
- Commercialisation of knowledge: Spin-off and licensing of research conducted in the region creates jobs.
- More joint research projects in collaboration with industry and authorities should be created. Although it is important to facilitate a dialogue and increase the information level, concerted action is needed to take the organisation (and thus the region) one step further.
- Increase cross border research activities (dependant on the government-controlled research councils' will to allow for cross border research financing). Creating a joint “research area Øresund” would improve quality even more and make the region even more attractive for foreign investments.
- Better co-ordination of the fragmented innovation systems. There are many actors, and it does not always seem clear which organisation holds the responsibility. Øresund Science Region has established an “Innovation Group” to facilitate communication and information about innovation, and the two governments should support this work financially. In the longer run, the aim must be to establish a joint innovation committee for the Øresund Region with the responsibility to co-ordinate and facilitate action between the many actors.
- How can the region attract more venture capital from other parts of Denmark and Sweden as well as internationally? The Øresund Science Region should map the venture capital market inside and outside the region (not just for the specific areas covered by the platforms) and spread the knowledge. Increased focus on innovation and start-ups in areas related to the “new economy”. The region needs to be innovative both within IT and biotech as well as design, digital media and the service sector.

CHAPTER V: CONTRIBUTION TO SOCIAL, CULTURAL AND ENVIRONMENTAL DEVELOPMENT

Main findings in this chapter:

- HEIs are major contributors to the cultural life in the region.
- The region is a cultural stronghold within many areas: Design, film, architecture etc., and known worldwide for these competencies. These areas are strongly supported by the region's HEIs.
- HEIs are vital for the development and professionalisation of the leisure economy.
- The links between business and companies and culture/creativity are of increasing importance. The universities are large sources of these resources.
- The HEIs have a positive impact on the cultural environment and the bustling, vibrant city life and influence heavily on the high level of human and social capital in the region.

5.1. Introduction

When dealing with the contribution of HEIs to regional development there tends to be an imbalance between the focus on 'hard' facts – mainly economic factors that are easily measurable – compared to the more soft approach dealing with aspects of a region that does not at first sight contribute to the economic growth and development. In spite of that a couple of terms have made their ways onto the scene of regional development, and have proved to be some of the more central aspects to pay attention to. These are factors like human and social capital, which have a major impact on the regional economic performance. Challenges and barriers to economic development are in that sense not linked to a small number of limited factors, but rather to the sum of all structures, physical and non-physical, within a region. In other words is it important to have in mind that a region's capacity is made up of tangible as well as intangible features. HEIs contribute in more than just a few traditional ways to regional development ('producing students', making research, doing technology transfer etc) and in this chapter we will deal with some of the more intangible, yet very important, features.

In the increasing competition between countries, regions and cities, the importance of the cultural and social aspects is rising. The challenges of globalization are, as described in earlier chapters, a main focus on both a regional level, as well as on national level. In that regard is it important to take a closer view on how the Øresund Region is performing in relation to cultural, social and creative matters.

It is a widespread belief among the HEIs in the region that their mission goes further than higher education, research etc. They consider themselves proponents of education in a wider sense ("bildung") – as they hold and spread a large part of the total knowledge of society. The HEIs see themselves as "good citizens" – contributing to the common good and to the development of society at large. In the Øresund Region, the high concentration of HEIs further adds to this. Generally speaking, the HEIs are home to theaters, musical events, art museums, choirs etc. In Copenhagen, both HEIs and national institutions of culture are present. In Øresund SE, however, the HEIs are almost sole providers as Sweden's capital is far to the north. Thus, for centuries cultural life in Øresund SE has involved LU. The city of Lund has – despite its modest size – a large number of publishers, cinemas, theaters etc – all a sign of a rich and varied cultural life, and LU and its students are of course part of the explanation. A large university and the many young and educated people that come with it create a demand for culture, and this has a huge impact on the local cultural life.

5.2. The Human Capital of Scandinavia

The Scandinavian countries and the major cities normally get very good results in most of the international rankings concerning quality of life and living standards. This, in combination with the rich cultural life, the atmosphere, students and – also – business and industry has led to the brand name Øresund – The Human Capital of Scandinavia.

The Capital in the Human Capital of Scandinavia – Copenhagen – is known worldwide for its rich cultural life. Curiously enough the British magazine Wallpaper, respected arbiter of all things hip and happening, has named Copenhagen among the ten coolest cities in the world. The magazine's trend spotters claim that the standard of living is higher here than in any other capital city in the world and cite the city's buildings, shops, international outlook and rich design heritage as some of the reasons for its high ranking. The magazine reports that of all the Scandinavian capitals, Copenhagen is arguably the most cosmopolitan. Despite its modest size, the city has a rich mix of things to do, see and take home. They further claim that the Danes know how to live, in all senses of the word¹⁴³.

Wallpaper's claims are supported by a more professional survey. In a worldwide quality of life survey, conducted by Mercer, Copenhagen was ranked as the world's eighth best-placed city. Among the European cities, Copenhagen ranks four.

Table 5.1: Mercer's Quality of life survey

1. Geneva
2. Zurich
3. Vancouver
4. Vienna
5. Frankfurt
6. Munich
7. Düsseldorf
8. Copenhagen
9. Bern
10. Sydney
18. Stockholm
20. Helsinki
49. Hamburg

Source: Mercer Human Resource (2004).

The evaluation is based on 39 criteria including political, social, economic and environmental factors in order to assess the cities' attractiveness to international employees in Copenhagen. A range of qualities related to the living and work environment explains an overall satisfaction with Copenhagen. High priority issues among international employees include the fact that Danish employers are team players, flexible, and show a high degree of respect for the employees' family life. The international employees experience a society, where they are easily integrated, due to the openness, rich social life and not least the language proficiency. The Danish (and Swedish as well) population's language proficiency are among the highest in the world and with a total of 40,000 international employees from North America, Europe and Scandinavia; an international community atmosphere is present in the city¹⁴⁴.

¹⁴³ Source: <http://www.visitcopenhagen.dk/composite-485.htm>

¹⁴⁴ Source: <http://www.copcap.com/composite-8027.htm>

In fact Denmark and Sweden rank respectively second and third best English speakers in Europe according to the European Commission¹⁴⁵.

5.2.1. A region rich on human capital

Creativity or human capital can be seen as one central aspect that has increased notably in economic and regional thinking during the last decade. Kerstin Cederlund¹⁴⁶ argues that the third role of the universities – the obligation to participate in collaboration with the surrounding society – should not be understood merely as collaboration with industry. Instead, collaboration with institutions of culture and art in the university's region should also be considered an important part of the university's role. The argument is that a vivid and well-developed cultural life in a region is an important parameter when businesses are choosing their geographical location. Rather than collaborating with the existing businesses in the region to create regional development, a university that is collaborating with the cultural institutions is providing better overall conditions for the local and regional businesses, Cederlund argues, and this in turn contributes more to regional development¹⁴⁷.

The definition of human capital in this chapter is:

“The sum of knowledge, disposition, skills and expertise of people belonging to a region. Contrary to structural capital, human capital is the property of individuals. It is a source of creativity and innovation, and thus a competitive advantage of the region.”

To the best of our beliefs we conceive the region as being strong on human capital. This is supported by a number of factors, e.g. a study conducted by Capgemini in 2004, showed that the quality of the Swedish labour force was estimated to be the highest in the EU. Measured criteria included average number of years of education and percentage of the population with tertiary education¹⁴⁸. In that context a couple of interesting questions can be asked: Why the Øresund Region is capable at 'producing' a great deal of human capital? - And in that regard how the HEIs assist in the process. In other words: To what extent do HEIs contribute as central actors in the process of producing creativity and human capital?

First of all HEIs offer a wide range of programmes and courses related to the so-called “creative” areas. As seen in chapter two a great deal of ‘one of a kind’-HEIs are found in the region – especially in Copenhagen. These HEIs are sources of innovative and creative students and researchers in the international top league. Denmark and Sweden are known worldwide for design, architecture, film and other arts. The HEIs furthermore promotes their skilful students and researchers by holding exhibitions, concerts and conferences.

Second, culture and arts stand as central aspects of the Swedish and Danish societies. The region has a long history when it comes to educating people in the arts at both a high level, but also in general. It has been a long-standing tradition that people were encouraged to express themselves artistically – designing, playing an instrument and within other arts. The tradition has been supported by the many folk high schools (“højskoler”) scattered around the countries, where people of all ages attends courses lasting from a single week to many months. Art, music and other creative genres are also an important part of the ordinary school system, all the way from kindergarten to university. In that sense there is not a great deal of contradiction between the two countries.

Cederlund (2004) has conducted a survey of Sweden's geography of culture. The findings are unambiguous:

¹⁴⁵ Source: <http://europa.eu.int/comm/education/policies/lang/languages/>

¹⁴⁶ Cederlund Kerstin is a senior lecturer in cultural geography at LU.

¹⁴⁷ Cederlund, Kerstin (2004)

¹⁴⁸ Invest in Sweden Agency. Source: http://www.isa.se/templates/Normal____2141.aspx

cultural life in Sweden is found in the large university cities such as the capital, Stockholm, and Lund in Øresund SE. These cities are also the ones that have benefited the most from the expansion of the Swedish university sector in the 1990's. These finding leads her to conclude that the importance of collaboration between universities and the cultural sector is often overlooked, and she thus argues for an increased focus on this. This chapter will, drawing on Cederlund, investigate the collaboration between the HEIs in the Øresund Region and the cultural and art life of the region.

The university cities as cultural centres are dealt with in a recently published report¹⁴⁹. According to the report, only the university cities can compete with the metropolis when it comes to cultural activities. Furthermore, the local cultural life is a major reason for many young Swedes when they decide where to go to university. Thus, for the universities, being located in a city with a vibrant cultural life is a way of attracting students. Actually, it works the other way around as well, as a large university with many employees as well as students create a demand for culture. Thus, the university city and culture have positive impacts on each other.

In general terms it could be argued that universities are among the most important providers of cultural 'products', while the surrounding cities consume cultural 'products'. But consumption is not just a matter of leisure and entertainment. The ideas and the research that evolve from the HEIs often become entangled in entrepreneurial projects and innovation. In that regard it is important to underline that cultural products from the universities have a great impact on the development of new businesses and related areas etc. By using national, regional or local culture, it becomes possible to separate oneself (and one's product) from the competitors. With the decreasing importance of the nation-state – at least in Western Europe – the search for other common denominators have led to an increasing focus on the regional and local cultural heritage and standing of today. Furthermore, it has been argued by modern economists (Richard Florida among others) that culture plays an important role when creative and innovative people are choosing where to live and work. Attracting these people has become a goal just as attracting foreign investments.

In this sense, the bi-national character of the Øresund Region could become an important, critical asset when competing with other large cities and regions in Northern Europe, such as Berlin, Stockholm and Hamburg. As shown in chapter three, the Øresund Region is perceived as attractive for investment because of the high quality of life and the well-educated population. These qualities are not unique to the Øresund Region, in fact it could be argued that most cities and regions in Northern Europe – perhaps the entire continent – could have received these remarks. What makes the difference in the ever-increasing competition could however be the cultural heritage and everyday life in the region.

5.2.2. Cultural aspects of the region's HEIs

The HEIs support the cultural life in the region in different ways. Several of the universities have museums and botanical gardens that they use for research but also open to the public. To mention a few: LU, KVL and KU all have botanical gardens. LU maintains an art museum and KU runs a museum of zoology. In this context it is noticeable that the universities do not manage sport teams.

There are many HEIs specifically within the area of fine and performing arts in the Øresund Region. This is not least because Copenhagen as Denmark's capital is home to several one-of-a-kind HEIs such as the National Film School and the Royal Danish Academy of Music. The Royal Danish Academy of Fine Arts, School of Architecture shows approx. 20 public exhibitions each year covering all aspects of the architecture and design field. Furthermore the school has a permanent exhibition and collection of modernistic furniture. Institutions like these contribute to the cultural life in the region by hosting concerts, having film festivals etc. Furthermore, the

¹⁴⁹ Westlund, Hans (2004)

students of these schools contribute considerably to the local and regional cultural life as part of their studies. But also on the other side of Øresund, in Sweden, a number of institutions that educates in fine and performing arts can be found¹⁵⁰.

In addition many of the universities and university colleges in the region offer educational programmes and courses within this area. At Copenhagen Business School, the Center for Tourism and Culture Management both educates, researches and provides analysis of service management and related areas¹⁵¹. The centre is the home of education and research with Service Management, with a focus on tourism, cultural events, leisure management. For instance there is a Master's Programme on Leisure Economy, RUC offers a new education in the area of Performance Design, which aims at providing the students with tools for planning and managing events. This education can be combined with any other programmes at RUC. Finally, RUC offers students the opportunity to combine the study of geography and economics into a tourism-directed degree¹⁵². The University of Copenhagen has a programme on "Theatre", and Mah has a School of Arts and Communications. LU offers a master in service economy at Campus Helsingborg and on both side of Øresund a number of new educational options within the field will be available in a couple of years.

5.2.3. Growth in the creative industries

Creative industries have become very important parts of the economies in the western world. They account for a growing amount of the total workforce and an increasing number of businesses use creative elements to sell and market their products. In addition to creating jobs themselves, creative industries are also important because of the strong attraction they provide to creative people as they decide where to live and work. Communities that tend to support cultural and related activities tend to draw more creative and talented people, who in turn may start-up new organizations and, eventually, contribute to economic development¹⁵³.

In 2005, the Greater Copenhagen Authority issued a report about culture and leisure economy in the Greater Copenhagen Area¹⁵⁴. The report identifies three objectives, which are attainable through a diverse and bustling cultural life: Creating jobs, increasing tourism (turnover in the tourism sector in the Greater Copenhagen Area in 2001 was 12.8 billion DKK (1.7 billion euro) and finally the cultural life is an important location factor for businesses planning to establish themselves in a new region or country. In that context it is advantageous that the region bursts with culture. Thus, culture is perceived by one of the key stakeholders in the Øresund Region not only as a specific and important economic branch, but also to a large extent as a driver for economic development, both indirectly through international investments and directly through tourism.

A rich cultural life is often associated with the leisure economy. From 1997-2002 the development in employment the businesses of the leisure economy grew with 31 % in the Greater Copenhagen area. In the leisure economy jobs are characterized by being increasingly well paid and creative. As described in chapter two a growing number of educations within the leisure economy are being offered to students and professionals. A recent report from the Greater Copenhagen Authority argues that Copenhagen is a unique place for further developing the leisure economy. Copenhagen easily competes with the other big cities like Berlin, Stockholm and London.

¹⁵⁰ In chapter two, a complete list of HEIs related to cultural and creative educations in the region is presented.

¹⁵¹ Source : http://www.cbs.dk/forskning_viden/fakulteter_institutter_centre/institutter/oekonomi/tcm

¹⁵² Please note that this is considered continuing education – accordingly, there is a fee for taking the degree. www.ruc.dk

¹⁵³ Florida, Richard (2002)

¹⁵⁴ HUR (2005)

Facts about the leisure economy in Denmark:

- In 2001 the leisure economy had a turnover of 23.3 billion Euro (175 billion DKK), which accounts for 7.3 % of the total private turnover in Denmark.
- Employed nearly 170.000 on a full time basis, which accounts for 12 % of the total workforce.
- The total export of the leisure economy was 9 billion Euro (68 billion DKK), which accounts for 16 % of Denmark's total export.
- Danes spent 8.5 billion Euro (64 billion DKK) on the leisure economy, which accounts for a total of 10 % of the total spendings in all Danish households.

The tables below show graphically the growth in Denmark's creative industries:

Figure 5.1: **Growth within Denmark's creative industries**

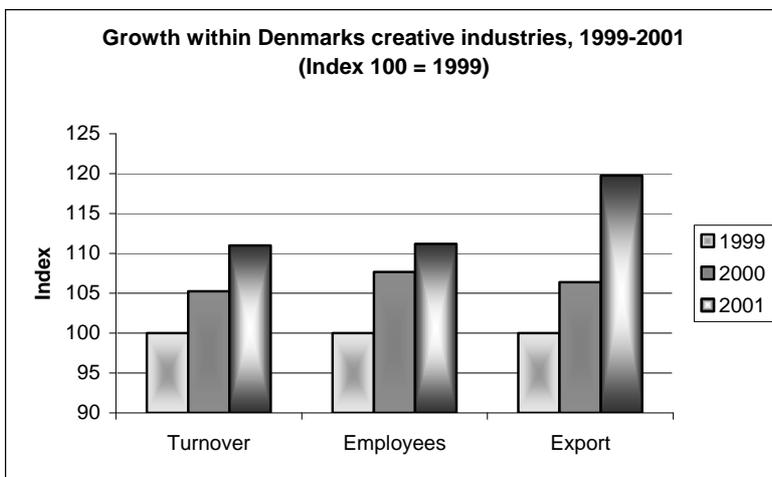
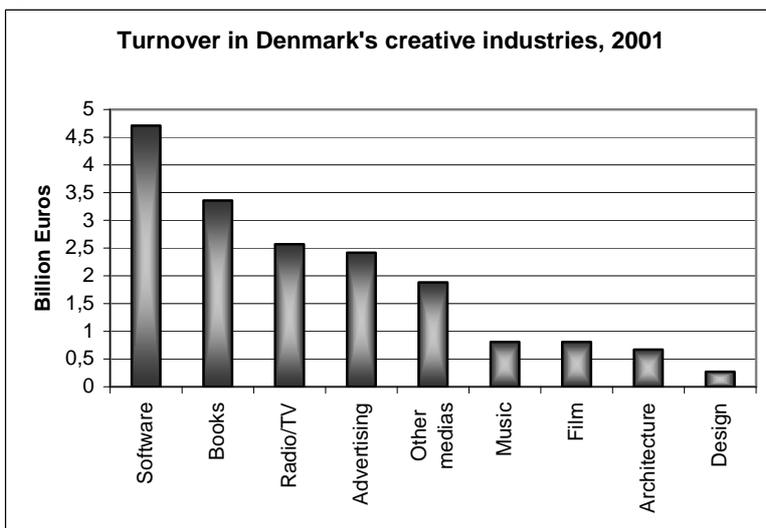


Figure 5.2: **Turnover in selected creative industries in Denmark, 2001**



Source both figures: Copenhagen Capacity, www.copcap.dk.

Similar figures do not exist for Øresund SE.

5.3. Social capital – increasing economic performance

Does the level of corruption; civic participation and trust affect the economic performance in a region? Even though it is hard to completely determine such matters it is inarguable that it does imply to a certain degree. This much-debated aspect in economic and geographic theory is known as social capital. The term refers to the strength of the personal networks and contacts within an area, like a country, region etc. The term is not new, yet it is especially Robert D. Putnam¹⁵⁵, who has conducted several scientific investigations into the question of the role of social capital. He argues that the level of social capital in a society (or in this case a region) influences on the ability to create and maintain economic growth and organizational advantages.

Putnam defines social capital in a broad sense as: *“Trust, norms and networks, which can improve the efficiency in a society by improving the possibilities for coordinating actions”*¹⁵⁶. This means that trust, norms and networks are elements of the social life, which makes people capable of acting more effectively, when they are pursuing common goals. Trust and networks are in that understanding not just the glue that binds people together; they also stretch across an entire region or country and bonds people together with only little or no knowledge of each other.

It has been argued that the universal welfare states of Denmark and Sweden could have a negative impact on the level of social capital within a society. The argument is that the states role as universal care-taker eliminates the civic engagement and makes people care for only their closest relatives. Putnam strongly disagrees on that point of view, as he puts it:

*“They (the Scandinavian welfare states) encourages to bonding social capital, because they urge people to understand themselves as part of a wider national community and not just care for their own family and neighbours [...] When I speak to an assembly I often show evidence, which proves that across the OECD countries – in as far as it is measurable – is there a strong positive not negative correlation between the pool of social capital and the size of the welfare state. Those societies with the highest level of social capital and civic engagement are the Scandinavian countries.”*¹⁵⁷

When Putnam talks of social capital he underlines the importance on both national, regional and community level. On a regional level it has a clear influence on the economic performance, which the following excerpt emphasizes:

*“Firms in communities with a large stock of social capital will, of course, always have a competitive advantage to the extent that social capital helps reduce malfeasance, induce reliable information to be volunteered, cause agreements to be honored, enable employees to share tacit information and place negotiators on the same wave-length. This advantage gets even bigger when the process of globalisation deepens the division of labour and thus augments the need for co-ordination between and among firms”*¹⁵⁸

An important element in the creation and maintenance of social capital in a regional perspective are in fact the HEIs. They act as important players and interact with the civil community, the public institutions and organisations as well as private businesses. In that sense they are central as meeting places for different regional and national actors, but they also bond the region with the national and global level. On that background it could

¹⁵⁵ Putnam Robert D. is professor of social science at Harvard University

¹⁵⁶ Putnam, Robert D. (2000)

¹⁵⁷ Interview with Robert D. Putnam in Hulgård et al (2001).

¹⁵⁸ Maskell, Peter (1998)

be asked whether the HEIs of Denmark and Sweden should be better at producing and maintaining social capital compared to HEIs in other countries. Some of the most relevant features of the HEIs in this regard are:

- No admission fee at universities or other HEIs¹⁵⁹. This means that many people from different groups in the surrounding society attends universities and thereby prevents ‘social blindness’ and thus strengthens the social coherence force (please see ‘Widening participation’-part in chapter two).
- Large study grants and cheap loans available to all students, even though the system differs between Denmark and Sweden. This results in large intake from different social classes with leads to the same strengths as mentioned above (see the ‘student recruitment’ part in chapter 2).
- All universities in the region have realised the potential of joining partnerships with other public and private partners in order to establish science parks, research clusters and business clusters, cultural events, new educational services etc.
- Universities and other HEIs act as meeting places for many different actors – students, researchers and people from the surrounding community. At the same time it is the place where the regional and the global levels are linked and knowledge, ideas etc. are spread.
- The whole school system in the region is free – all the way from Kindergarten to highest university level. This gives everyone a chance of getting a higher education degree and strengthens the social ties in the community or society.

These considerations are supported by a recent study of social capital in the European countries. Based on a number of factors the researchers have compared 30 European countries and this clearly indicates what Putnam describes above. Denmark and Sweden rank as respectively number three and four, when factors like trust, civic engagement, corruption and economic freedom are used as measurement for social capital-level. The top ten countries in the study can be seen in the table below.

Table 5.2. European social capital ranking – top 10 countries

Country and ranking
1. Switzerland
2. The Netherlands
3. Denmark
4. Sweden
5. Norway
6. Finland
7. Iceland
8. Luxembourg
9. Ireland
10. Germany

Source: Bjørnskov and Svendsen, 2004

In the study it is further concluded that: “The social capital ranking results indeed show that Scandinavia (Denmark, Norway, Sweden and Finland) is among the seven top ranking countries [...] We identify two main reasons [...], namely the level of decentralisation and, consequently, the level of social capital.”¹⁶⁰

¹⁵⁹ From 2007, Danish HEIs will charge students coming from outside the EU a tuition fee. Thus, free education from then on only goes for European citizens. No decisions have been made in Sweden on this topic.

¹⁶⁰ Bjørnskov and Svendsen (2004)

Ultimately let us take a closer look at one of the most important factors, when it comes to supporting the level of social coherence within a society. Transparency International has conducted a scientific investigation into the question of international levels of corruption. The so-called Transparency International Corruption Perceptions Index 2004. The index shows that Denmark and Sweden are among the top five countries in the matter of having the lowest level of corruption.¹⁶¹

The conclusion must be that the Øresund Region and the countries it consists of have some of the highest levels of social capital globally. This gives unique opportunities for businesses and firms to establish themselves in societies where they can benefit from a strong civic community, a place where everyone gets a chance of higher education, a region where all people meet and greet. The HEIs play a vital role by being the place where different worlds meet and thereby joining forces between different actors in the society.

5.4. Impact on cultural environment

How do the HEIs impact on the cultural environment? And to what extent? As described earlier in this chapter human capital, culture, creativity and the social life play a very important role in supporting the economic growth and development. We have furthermore shown to what extent the HEIs contribute to the creation and maintenance of the factors mentioned above. In this part we slightly change focus and take a brief view on a couple of other aspects related to cultural environment and the leisure economy. Our focus is mainly the large cities – especially Copenhagen - where cultural life sprawls and where many new ideas emerge.

The HEIs in the Øresund Region are involved in a number of activities with a purpose of cultural development. This is very much the case within the area of digital media, which comprises film, music, computer games etc. On the following pages, we will also have a look at a couple of examples of the involvement of HEIs.

First of all let us take a closer look at the urban qualities of the region. The prime venue for the leisure economy is the metropolis. Only here is the abundance of cultural activities, art etc. present in sufficient numbers for the area to reach critical mass. The large cities in the region draw young people, as well as “the creative class”, over long distances. With Scandinavia’s largest metropolitan area (the cities around Øresund), situated in the centre of the region, the Øresund Region has huge potentials to exploit the possibilities of the leisure economy. There are many national cultural institutions in the Greater Copenhagen Area that all have a national focus: to mention a few: The National Gallery of Art (art collections), the Royal Theatre (theatre, opera and ballet) and the National Museum (historical collections). Furthermore, large cultural institutions and organisations in the Øresund Region attract hundreds of thousands of visitors every year: the Tivoli Gardens, for instance, had 4,316,000 visitors in 2004; and the modern art museum of Louisiana had 502,088 visitors. There are other important cities in the region as well. On the Swedish side e.g. Malmö and Lund and on the Danish side e.g. Roskilde and Elsinore. They are all cities with hundreds of years of history, which can be seen in buildings, traditions, museums etc. In combination with Copenhagen they – along with many other cities, villages and beautiful landscapes - offer a great and varied urban and rural setting in the region.

5.4.1. HEIs’ role in the local and regional cultural life

The universities in the Øresund Region collaborate with society through a variety of means.

- Public seminars and conferences, Open House-activities etc. In general, lectures and seminars held at the universities are open to the public. The relevant Danish universities all took part in the national Science-festival and the nation-wide Research Day, where scientists and researchers from universities gave

¹⁶¹ Source: <http://www.transparency.org/cpi/2004/cpi2004.en.html#cpi2004>

public lectures about their activities and the universities “opened their doors” for the public. In Sweden, Lund University has for many years had a Humanities Festival, where the Faculty of Humanities has opened its doors to the public and held a number of special activities.

- Media. All universities have established information and/or communication units, providing easy access for the media to the universities’ resources. Also, they publish news about research and education at the university as well as other topics relevant for the public. Researchers participate in the public debate through interviews etc and also serve on a variety of public boards. There are no central data available about this form for involvement of the universities as this is the responsibility of the individual researcher.
- Museums and botanical gardens. Several of the universities in the region have museums and botanical gardens that they use for research but also open to the public. To mention a few: LU and KU both have botanical gardens and KVL has a garden. LU maintains a museum for modern art and KU maintains a Museum of Zoology. DTU has close collaboration with the science centre Experimentarium.
- Alumni work. The importance of the universities’ alumni students is on the rise. The universities have an interest in keeping the contact with alumni students because they function as ambassadors for the university in society and thus play a very important role in the university’s public relation. Also, the universities wish to recruit their former students to continuing and life-long learning programmes, particularly in Denmark.
- Network. The universities in the Øresund Region all take part in relevant network organisations. Within the nine platforms of the Øresund Science Region, universities collaborate with industry and society, and several of the universities are part of other networks as well.
- Innovation and entrepreneurship. The universities are heavily engaged in the innovation system of the region. Lund University, for instance, holds part of the ownership of the famous science park of Ideon, and several of the Danish universities are involved in the science park Symbion in Denmark (the vice-chancellor of DFU is on the board). Several of the universities support the “Venture Cup”, aiming at giving the students taste for starting up their own company upon graduation.
- Many individuals (researchers, cultural persons etc.) have their basis at the regions HEIs and do heavily influence on the society around them. Many of them are well-known in an international context and bring attention to the region.

5.4.2. Home of scientific fairs and conventions

Partly because of the many HEIs in the region, the city of Copenhagen is a popular host for scientific fairs and congresses. In fact, Copenhagen is a leading venue for congresses within biomedicine, not least because of the large and high standard facilities available¹⁶². In a 2003 survey on the most popular countries and cities for congresses, the Union of International Associations ranks Copenhagen / Denmark as 8/17¹⁶³. The congresses accepted into this statistic are those organized and/or sponsored by the international organizations, which appear in the Yearbook of International Organizations. In this survey, Copenhagen ranks higher than Berlin, Rome and New York, whereas the front-runners are Paris, Vienna, Geneva, Brussels, London, Singapore and Barcelona.

5.4.3. Ørestad – a living lab in the region

The planning of the bridge over Øresund was followed by plans for a metro in Copenhagen and a completely new part of town, Ørestad. In 1992 it was decided to turn a 600 m wide, 5 kilometer long strip of land into the new Copenhagen neighbourhood of Ørestad. When finalised, 60,000 people will go to work here, 20,000 will live in Ørestad, and 20,000 will study in Ørestad¹⁶⁴. In the northern part of Ørestad, closest to the city centre,

¹⁶² HUR (2005); Wonderful Copenhagen et al (2004)

¹⁶³ Source: <http://www.uia.org/statistics/press/press04.pdf>

¹⁶⁴ Source: <http://www.orestad.dk>

new buildings for the Faculty of Humanities at the University of Copenhagen has been built along with new residential areas, a new national head quarters and concert house for the Danish Broadcasting Association as well a new university, the IT-University of Copenhagen.

Together with CBS, the Faculty of Humanities at KU and ITU, as well as several major players in the digital, cultural business (CSC Denmark, Hewlett Packard, Nokia Denmark, TCD and the newspaper Børsen), have created CrossRoads Copenhagen¹⁶⁵. Crossroads Copenhagen aims at placing the city of Copenhagen at the very front of the network society and as an international centre for knowledge, new competencies and new technology in the digital, cultural area. Ørestad is to be a huge living lab for the testing of new technologies, taking advantage of the developing new area of Ørestad. Here, several thousand people will do their daily work – at the universities, at the major companies or in their homes, and Crossroads Copenhagen wishes to perform experiments on how new technology is transforming everyday life. Crossroads Copenhagen then wishes to disseminate the acquired information, thereby placing Ørestad as an international centre for testing new information and communications technology.

5.4.4. Design in the Øresund Region

Scandinavia is known worldwide for its design. Design as a product and process is also very much present in the Øresund Region, both in forms of museums and exhibit halls, in form of companies in that sector, and in form of HEIs providing educations in that specific area. Design is one of the key areas where both countries are expecting growth and increased economic importance.

In Copenhagen, the Danish Design Center works to promote the use and knowledge of Danish design both nationally and internationally¹⁶⁶. These goals are to be reached through a number of different activities. Furthermore, a number of museums such as the Danish Museum of Decorative Art also play a role in including design to the agenda.

New Zealand Institute of Economic Research published in 2002 a report, which benchmarked countries from all over the world in how good they were at designing, manufacturing and selling design. Five indicators where in that regard important: Extent of branding, capacity for innovation, uniqueness of product designs, production process sophistication and finally extent of marketing. When all these parameters are included in a survey both Denmark and Sweden turn out with impressive results:

Table 5.3: Top ranked countries in Design

Country
1. Finland
2. United States
3. Germany
4. France
5. Japan
6. Switzerland
7. Netherlands
8. Sweden
9. Denmark
10. United Kingdom

(Source: Johansson et al, Projekt Designkartläggning, 2004)

¹⁶⁵ Source: <http://www.crossroadscopenhagen.dk>

¹⁶⁶ Source: <http://www.ddc.dk>

The HEIs in the region are – through the Øresund Science Region platform Øresund Design – involved in promoting the Øresund Region as a region of design and taking exploiting the competitive advantages, design can add to a company's products. Also involved in Øresund Design are The Danish School of Art and Design, The Royal Danish Academy of Fine Arts, Danish Design Center, Bornholm's Academy as well as the Foundation Swedish Industrial Design (SVID) and Form/Design Center.

5.5. Conclusion

In this chapter we have examined some of the more intangible features of the region. This has provided the opportunity to point at some of the more 'soft' facts of the region, which nevertheless have a huge impact on the development both economically and in the society as a whole. We have argued that the Øresund Region holds large pools of human and social capital. It has been further argued that both these forms of resources have a crucial impact on the economic performance. Furthermore has it been emphasized that businesses and firms that choose to establish themselves in the region locate themselves in societies where they can benefit from a strong social welfare state, with a high level of civic engagement, free education, hospitals etc. The HEIs play a vital role by being the place where different worlds meet and thereby joining forces between different actors in the society. Furthermore the HEIs produce social and human capital by opening up themselves to all students regardless of their economic capacity, as well as being an important actor in the local community.

The main observations in this chapter are:

- A large number of international rankings put Denmark and Sweden among the top five countries when it comes to quality of life, language abilities, honesty and a number of other good things
- Copenhagen is one of the best cities in the world to live in. According to different investigations Copenhagen offers high quality of life, a hip city life and a great climate for new business establishment.
- There are high levels of social capital in the region. This means that the civic engagement is high, the level of corruption is low and that the economic and political freedom are among the best in the world.
- There are high levels of human capital in the region. This is especially seen in the highly skilled labour force. This gives remarkable opportunities of developing new ideas, innovations etc.
- The HEIs impact on the cultural environment; for instance is Copenhagen one of the most used cities for scientific fairs and conventions. Another central aspect is the fact that many cities in the region in collaboration with the HEIs have joined forces in e.g. design matters and the establishment of the new Ørestad City.

5.5.1. Visions and challenges

- It is evident that a lively cultural life is an important location factor for new businesses. In that context it should be taken into consideration to further strengthen the ties between cultural institutions, public and private actors. Thereby taking even further advantage of the many skilful and innovative students, researchers, architects, designers and performing artists in the Øresund Region.
- Copenhagen is renowned for its status as one of the most hip cities in the world. This label should cover the whole region.
- An increased focus on innovation in the HEIs programmes and courses. By being an integrated part of education; innovation in the region could be strengthened.
- The founding of a *cultural event platform* in order to stimulate the collaboration between HEIs, businesses and public actors in this regard. This could lead to an increased number of events attracting international interest and produce a great deal of skilful event-makers.

CHAPTER VI: CONCLUSIONS - THE CONTRIBUTION OF THE HEIS IN THE ØRESUND REGION TO REGIONAL DEVELOPMENT

The results of this self-evaluation report will – along with visions and challenges relating to each of the particular areas - be presented in the following order:

1. Higher Education
2. Research and Development
3. Innovation
4. Labour Market
5. Collaboration with Society
6. Culture
7. Region building across Øresund.

6.1. Higher Education

The HEIs have a major impact on the region with 150,000 enrolled students in a large variety of programmes and degrees.

The HEIs play a most central role in the vision of both Denmark and Sweden to create knowledge-based growth. The HEIs possess and deliver a major part of the total knowledge in society, and are as such important to include in strategies to meet the visions. This is the light in which the engagement of the large number of actors in the “Øresund Science Region”¹⁶⁷ should be seen.

With 150,000 students enrolled in the Øresund Region, the HEIs dominate the total educational supply in the region. The HEIs educate within a wide range of areas – both specifically targeting regional competencies (for instance, DFU that educates graduates to the medico- and biotech sector of the region) and educating for national and international labor markets. Further, with the capital of Denmark, Copenhagen, located centrally in the region, there are several “one-of-a-kind” institutions in the area. The picture in total is thus one of a region with a large variety of educational offers and study options. This makes the region very attractive to live and settle in – both for companies, organisations, specialists and students.

The student population at the HEIs in the Øresund Region has increased considerably over the last decade following an expansion of higher education in both Denmark and Sweden. 14 HEIs in the region collaborate within the Øresund University. A number of educational collaborations have been established, and models for educational co-operation have been established. Further, an international summer university, Øresund Summer University, is being held every year and an international study portal been created.

Visions and challenges:

- *Bologna process*

When the Swedish Parliament decides to introduce a three-cycle system in accordance with the Bologna model in the Swedish system of higher education it will facilitate the continuing development of the educational co-operation within the Øresund University leading to specialization and increased competencies for the region as a whole. ØU could very well be made into a European model for “The Bologna Process”

¹⁶⁷ Conclusions on Øresund Science Region are found in section 7. Region building across Øresund.

- *Decision-making competencies*

For Øresund University (the collaboration between the HEIs in the region) to develop further, more efficient ways for joint planning and decision-makings must be developed and, of course, actual decisions made that are valid for all member universities. The HEIs can then increase the level of joint planning and they can consider co-ordinating their activities both within education and research to an even higher degree than today

- *Educational co-operation*

More educational co-operation is needed for the region to develop even further. With division of labor between the HEIs in the region, economies of scale and specialization could be attained leading to better quality in both education and research. Some of the tools needed have already been developed – Øresund Study Gateway, for instance – but more attention should be given this particular area. The specialization needed can both be attained through co-operation and competition, or a combination (collabitation).

- *Internationalisation*

The HEIs in the region should – by working together on the establishing of international programmes and degrees – take part in the growing international market for education. With the many HEIs in the region and the large variety of programmes and options, there is a large potential for this, which today is only sparsely exploited. Here, Øresund Summer University could be used even more as an “exhibition window” for the high quality research and education in the region. It would be natural to use the summer courses to attract highly qualified students to the region and – while they are taking the summer courses – match them with regional companies in need of highly qualified labor.

6.2. Research and Development

The HEIs in the Øresund Region perform research at the highest international standards.

The HEIs in both the Danish and Swedish part of the Øresund Region have ambitions to belong to the world’s best HEIs. At present, the HEIs in the Øresund Region form Europe’s 5th largest research center, and co-operation with the private companies in the region takes place to a very large extent. The HEIs are of interest for the region’s companies as they participate in the global flow of knowledge and perform research at the highest international level.

The HEIs in the Øresund Region have thus created one of the largest knowledge bases in Europe. This has in turn increased the attractiveness of the region on a global scale to both researchers and companies. The HEIs educate and train researchers and Ph.D’s for the private sector, and having a lot of research also contributes to the active and lively cultural life in the region. There are, despite the positive trends, also difficulties, as national research funds normally are distributed to Danish-only or Swedish-only groups, not Danish-Swedish research groups. This makes joint research projects across Øresund extremely difficult to get financed.

However, not all research in the region is performed by the HEIs. Many companies in the region have their own research programmes, and some of these are extremely large. For instance, 4% of Sweden’s GDP is spent on R&D, but only 25% of this is public expenditure. In the Swedish part of the region, large companies within both biotech and IT perform research, and it is not always the case that this research is transformed into production in the region, as the companies often are multinationals with a global presence.

The HEIs also have an impact on the society by attracting investments and high-tech companies to replace heavy industry and manufacturing companies. The urban parts of the region – the areas closest to the HEIs – are home

to a large number of international pharma and ICT-companies, and among their reasons for choosing the Øresund Region must be the strong knowledge base of the HEIs.

Visions and challenges:

- With the large dependency on private R&D in Sweden, public and private actors within R&D in the Øresund Region should increase efforts to link on both sides of the sound universities, public authorities and private companies within the triple-helix network. This linkage could strengthen the already existing clusters in the region and facilitate the growth of new ones.
- The Danish government should increase expenditure on R&D to meet the so-called Barcelona-goals of spending 3% of GDP on R&D. With the many SMEs in Denmark, the Danish government should spend more than it does at present with only 0,73% of the GDP spent on R&D. This figure should increase to at least 1% within a few years.
- The HEIs should engage the national level in a debate about cross-border research funding in order to alleviate the difficulties found in this area today and lobby more intensively than today for an acceptable solution.
- The HEIs in the region should consider the possibility of selling research and education abroad through joint ventures. With an expanding international market for research – particularly in East and Southeast Asia – the HEIs are facing a very large market. By joining forces the HEIs in the Øresund Region could reach the size necessary to get in contact with the relevant companies and authorities.
- Finally, ØSR is a unique instrument for triple helix cooperation in the region. Expanding and using this instrument more actively in order to create a joint Øresund area of research and innovation would be an excellent way of better taking advantage of the great potentials of the region, create better framework conditions for research and stimulate growth.

6.3. Innovation and technology transfer

The HEIs in the region contribute to innovation and high-tech entrepreneurship through technology transfer, commercialization of knowledge and collaboration with industry.

All HEIs in the region are active within technology transfer. By putting the knowledge acquired through research at the HEIs in use, the HEIs contribute to the development of the economy at large. The HEIs also commercialize their research results, which the Swedish HEIs have been doing for more years than the Danish. The Swedish technology transfer and commercialization system seems more professionalized with fewer and larger units than their Danish equivalents, but in both countries there is a manifold of actors on this stage leaving an image of a somewhat fragmented system.

The HEIs collaborate actively with science parks (several of which are partly owned by the universities) and innovations milieus in the region and the HEIs hereby contribute to high-tech entrepreneurship. The HEIs thus acts as ports importing and exporting knowledge that industry and society can draw upon. This “port of knowledge”-function is crucial for the high-tech innovation system.

The HEI cannot contribute to all kinds of innovation and not all private companies can benefit from collaborating with the HEIs, but the HEIs can contribute – and do so! – to knowledge-intensive innovation. The foremost example is the so-called “Ideon Phenomenon”. In the city of Lund, the science park “Ideon” was founded in 1983 and Lund University today owns 60% of the park. It is one of the oldest and largest science parks in Europe, and it has put its mark on the city. The companies that have hatched since the founding of Ideon (including supplier companies), today employ 8,600 people.

Finally, start-up companies in the region experience difficulties in obtaining venture capital from the other side of Øresund, largely because the national actors are not allowed or encouraged to invest outside their country. This of course is a suboptimal situation for the innovation systems in the region.

Visions and challenges:

- *Increased efforts to commercialize knowledge*
Today, the HEIs have engaged themselves into collaboration with society (industry as well as public authorities) in the Øresund Science Region, and ØSR has established contacts with the innovation milieus in the region. However, further action needs to be done. In the years to come, the HEIs within ØSR and ØU will have to:
 - Further professionalise the technology transfer-process. Many of the TTOs at the Danish HEIs are simply too small to have expert competencies on all levels. In this process it should be taken into consideration that concerted action from the universities in Øresund DK to transfer knowledge only has taken place for a very limited period and the effects of the efforts are not yet fully seen.
 - Improve the contribution to the innovation process. Øresund Science Region and Øresund University are currently exploring the possibilities of establishing an Academy for Entrepreneurial Studies in the region. In order to increase entrepreneurial consciousness with students, it is of outmost importance that such an Academy becomes financially secured for a long-term period.
 - Reduce the number of actors in the innovation process. With fewer (and thus larger) actors, competencies and resources would be used more efficiently and better strategic co-operation would be made possible.
- *Improve access to venture capital*
The two governments can as well contribute to the innovation system in the region. First and foremost by allocating more funds to innovation, as there is a lack of seed-money in the region. Further, more capital is needed in the technology transfer companies. In particular, the Danish government should formulate a coherent policy on technology transfer and innovation and restructure the whole system according to this.

If the two governments decide to let the national innovation and venture capital players also engage in projects on the other side of Øresund, this would lead to a much more optimal situation for the innovation systems in the region.

6.4. Labor Market

The HEIs impact industry through research results and education and training of researchers.

The HEIs impact those companies in the region in need of the “products” of the HEI, be it research or an educated workforce. In some areas access to the “products” of the HEIs is an extremely important localization factor – the biotech and IT industries are the prime examples. New biotech and IT companies locate themselves close to the HEIs or the university hospitals.

Thus, the HEIs contribute to the regional, knowledge-based economic growth through education and training of graduates and scientists (Ph.D’s). The training and education of students and scientists is one of the most important aspects of the technology transfer from the university to society. Graduates and Ph.D’s have an

important impact on regional R&D because they are the ones performing it. Thus, a very important point is that the HEIs educate and train the scientists of the private sector in the region.

Many companies in the region are, however, not affected by the HEIs. For many companies, especially those in the manufacturing and service industries, there is no direct relevance of the HEIs. But it is important that the HEIs improve their external communication even further in order for even SME's to be aware of the possibilities, the HEIs offer. On the other hand, industry and business should also be aware that HEIs are not inaccessible Ivory Towers but actually have a lot to contribute with.

In general, economic growth and job creation is high in the Øresund Region – especially in the university cities.

The HEIs supply highly skilled graduates to the labour force and continues to up-date the competencies of the labour force.

Societal demand for university graduates is on the rise. From 1991 to 2002, the number of employed university graduates in Denmark has increased from 120,000 to 171,000. The growth has primarily taken place in the private sector. Thus, the HEIs supply the labour force to the knowledge-based economic growth both Denmark and Sweden aims for.

Further, the HEIs are starting to work more intensively with the transition from university life to the labour market. A good example is the IT-University of Copenhagen, where all graduates can register themselves into a public database with record about current job situation etc. Thus, potential employers can look for employees here, and the graduates can see for themselves where other graduates have found employment. This, in turn, provides inspiration for the graduates on where to look for employment.

Also, more traditional alumni work – alumni associations, update courses and continuing education – are found at more and more HEIs. Hereby, the HEIs engage in a life-long connection with their graduates.

The HEIs have an impact on the labour market as large organizations with many employees.

The universities (not all HEIs) in the Øresund Region had a total of 20,455 people employed in 2004, and the character of the employees vary from unskilled to very specialized labor¹⁶⁸. This means that almost any job profile can be found at the HEIs.

The 14 HEIs in the Øresund University had a turn-over of 1.9 billion euro in 2004, and a very large portion of this is salaries to the employees. Besides, many of the 150,000 students and the large staff often live close to the HEIs and they thus have a huge impact on the local economy. The HEIs thus in some cases are vital for the local economy.

Furthermore, most of the turnover of the HEI is state financed. Thus, each HEI thus equals a major national investment in that area. Finally, as large organizations the HEIs also have a vast number of suppliers, delivering goods and services to the HEIs.

The HEIs are agents of social mobility in the Øresund Region.

Especially in Sweden, the HEIs have been active in widening participation in higher education. Lund University, for instance, has an action plan for widening participation, and Kristianstad University in Eastern Skåne has managed to recruit 84% of its new students from families with a non-academic background. Also in Skåne, the

¹⁶⁸ This figure does not include employees from Swedish University of Agricultural Sciences – Alnarp branch. As stated the figure does also not include number of employees from the Danish Schools of Art and other HEIs.

HEIs have participated in the build-up of study and learning centres throughout Skåne, providing all inhabitants with access to teaching and learning.

Furthermore, especially Mah has had the task of recruiting students with a non-Swedish background to higher education. Malmö is a multicultural city, and one third of the inhabitants in the city are immigrants. Among these are groups with a low frequency in participation in higher education, and one reason for establishing Mah was to widen the participation of these groups in higher education: in 2004, 22% of the students at Mah had a non-Swedish background, compared to 15% of the total student population at Swedish universities and university colleges.

Visions and challenges:

- *Further improve employment-possibilities*
As the three studies of graduates from Danish universities showed, an important factor for graduates finding employment is previous work experience. And even though the labour market has absorbed a significant increase in the number of university graduates during the last decade, unemployment is still an issue for many university graduates. The HEIs can and should help their graduates even more. For instance encourage students to do internships and thesis writing with companies to a larger extent than what is the case today. This will give students more experience with the world outside the university and also provide society with a skilled labour force from an earlier point in the graduates' career.
- Employers and HEIs in Skåne should consider introducing a system of hiring students for project work and other study related tasks. In Denmark, this gives many students invaluable labor market experience and it also provides both parties with knowledge of the expectations and capabilities of the other. Unemployment is relatively high in Øresund SE, also among university graduates, and it is natural to take inspiration from Øresund DK, where the labor market has been better able to absorb the increased number of university graduates in the last decades.
- *Contribute to the development of skills in the more peripheral parts of the region.*
By engaging themselves more actively in the development of skills in the more peripheral parts of the region – for instance by offering more and more E-learning programmes or “flexible” degrees, the HEIs in the region can play a large and important role in securing the development of the region as a whole. This also goes for the development of processes for recognition of formal skills acquired in one country in the other. More flexibility and more compatibility on the labor markets in the region will have a positive effect.

6.5. Collaboration with Society

The society perceives the HEIs as crucial to the development of both physical and economic structures.

Both the Danish and the Swedish HEIs in the region are perceived as central “instruments of change” by the society, both in terms of regeneration of cities and/or economic development in the region. In the Swedish part of the region, new university buildings have replaced old, worn-out industrial estates along the harbour fronts of Malmö and Helsingborg. In Copenhagen, KU's Faculty of Humanities is – along with the new ITU and CBS – key elements in the development of a new district, Ørestad, an off-shot of the bridge-building and region-building process. The vision for Ørestad is to develop a large “living lab” for the testing of new technologies in

collaboration between the universities, the Danish Broadcasting Association and large private firms as TDC (telecom) and CSC (it-services).

Another example of the use of HEIs as “instruments for change” is the former naval base at the Copenhagen harbour, Holmen. Here, several of the Schools of the Fine and Performing Arts relocated when naval activities were moved elsewhere, and they have contributed to the creation of a creative and very attractive district. Most recently, the new Opera House in Copenhagen was built here. In developing Holmen, it was critical to have the students of the creative and artistic schools to contribute in creating an attractive environment, and this has by all means been successful.

In the Swedish city of Malmö, the regeneration of the port has been centered on the establishing of Malmö University. Hereby, the city has transformed itself from an industrial and harbour city to a central part of the Øresund Region. Since the founding of Mah, the ambition has been to create growth in the city and to widen participation in higher education, and Mah has been successful in doing that.

Visions and challenges:

- *Increase awareness in the society of what the HEIs has to offer.*
The HEIs in the Øresund Region holds vast competencies for the society to exploit. However, both parties need to increase the ongoing dialogue and debate about engagement, collaboration and not least expectations. HEIs enjoy significant trust within the community and are regarded as important knowledgeable organizations. This should be further exploited by the society. Already today, university employees serve as experts on boards and committees and are engaged in the local and regional communities, but there exists no coherent strategy for communicating what the HEIs have to offer.
- *Increase engagement in the peripheral parts of the region*
The necessity of an economically strong core is clear, yet both sides of Øresund could benefit from a more even distribution of resources. In the years to come, creating positive spill-over effects for the more peripheral parts of the region will increase in importance.

6.6. Culture

HEIs in the Øresund Region: More than technology transfer!

HEIs influence the city and the region they are a part of. When it comes to culture, the HEIs contribute to the development of a rich and varied cultural life in the region through the many students – both students of art and design taking active part in the cultural life as performers, but also the mere presence of 150,000 students has a huge effect on the cultural life in the region, as they have a large demand for culture. The city of Copenhagen has, for instance, on several occasions been labelled one of the most “trendy” cities of the world – because of the high quality of life and the abundance of design. All in all, the region is thus very attractive to settle in for both companies and humans.

HEIs in the Øresund Region are trustworthy to a very large extent. Thus the HEIs can – and do so – influence the public debate through the participation of experts in media etc.

The Øresund Region has – largely due to the fact that Copenhagen as Denmark’s capital has several “one-of-a-kind” HEIs – a large and varied educational supply with the Fine and Performing Arts and they many students

studying here contribute to the development of the local and regional cultural life – both as practitioners and as spectators.

The HEIs and the environment around them are a central part in the international marketing of the Øresund Region and is thus used in the marketing done by both the inward investment agencies for Greater Copenhagen, Copenhagen Capacity, and for Skåne, Position Skåne as well as the regional marketing organization, Øresund Network. The large university-sector in the region is perceived positively, not least because it signals knowledge and knowledge economy as well as a rich and varied cultural life and an international perspective.

The HEIs as places where worlds meet

The HEIs are meeting places both between the regional/national on the one side, and the international on the other as well as between university and society. This means that the HEIs contribute to the creation of an open and tolerant environment.

Through international contacts (joint research projects, exchange of students and staff etc.) the HEIs as social systems receive inputs from and knowledge about the outside world. This provides an international perspective on life in the city, the region and/or the nation that the HEI is a part of. The HEIs could thus be seen as “ports of knowledge”, where students, researchers etc are shipped to and from the world with their knowledge.

There is a widespread tradition for having visiting professors at HEIs, and also joint research schools and programmes contribute to the exchange of knowledge workers. The HEIs in the Øresund Region together have contacts with more than 800 universities world-wide, and they receive more than 5,000 international students every year. To this figure should be added the many international contacts that all academic staff at the universities maintain, as well as the many students, not least Ph.D.'s, that come to the Øresund Region on their own.

Also within the region there is a diverse pattern of contacts between the HEIs and the surrounding society – ranging from formal representation on boards to more informal networks.

The most formal point of contact is the university boards. University boards in both Denmark and Sweden have a majority of members from outside the university. Through this formal representation, the society has a very large and formal decision-making power within the university system.

Less formal is the “Employer Contact Panels”¹⁶⁹ that for instance the DPU has established. Here, the university and the organizations that typically employ graduates from the university meet and exchange views on the competencies needed and what the university graduates have to offer. This information exchange thus contributes to increased understanding of the different parties’ needs and views and potentially leads to more employment. An “Employer Contact Panel” can also be found at Faculty-level, for instance at KU’s Faculty of Humanities.

Also, the HEIs are represented in many places in society – be it government advisory boards or committees, private sector boards etc. At CBS, the academic staff in 2004 held 170 positions on boards, councils and committees.

Furthermore, the HEIs are a very visible and important contributor to the knowledge in society, both through regular lectures open to the public and special lectures aimed at a broader audience. University professors act as experts in the media (written and broadcasted) etc.

¹⁶⁹ In Danish: Aftagerpaneler

The HEIs are thus places where worlds meet, and as such they are a key source of inspiration and transmission of new thoughts and ideas to the surrounding society

Human and social capital in the Øresund Region

With the existence of the 14 HEIs in the region, 150,000 students etc the Øresund Region holds a vast amount of human capital and is actually among the 5 largest knowledge regions in Europe. Counted separately, both Copenhagen and Lund are much smaller. Joining hands thus has promoted the two parts of the Øresund Region to the Champions League of regions in Europe.

The vast amount of human capital is likely to stem from the fact that the whole education system in the Øresund Region is free, and thus provides students from all backgrounds with the possibility to participate in higher education. Especially in Sweden there has been a focus on widening participation in higher education to groups with low university frequency. In connection with the rich and varied cultural life in the region, this provides remarkable opportunities for developing new ideas, innovations etc.

The Øresund Region also holds a vast amount of social capital (trust, norms and networks etc) and this has both a value in its own right and a positive influence on the region's economic performance. Civic engagement is high, corruption is low and the economic and political climate are among the best in the world to do business in. Recently, Denmark has been voted the best country to do business in. The HEIs contribute to the social capital as central, culture-bearing institutions in society and also to the creation of an open and tolerant society.

The quality of life in the Øresund region is high, and Copenhagen, in the centre of the region, is regularly voted as one of the best cities in the world to live.

Visions and challenges:

- Active engagements with cultural institutions to further develop the Øresund Region.
- Establish an organization like the ØSR-platforms in the field of culture and events. Potentially, the HEIs have a major contribution to make in this field, and this possibility should thus be explored. It could be an off-spring of some of the already existing platforms within Øresund Science Region, for instance the Humanities Platform.

6.7. Region building across Øresund

Contribution to the regionalization process

The vision behind the creation of the Øresund Region ten years ago was to create growth and development into the former industrial economies on both sides of Øresund, to create an integrated region and strengthen the region's competitiveness. This should happen through a concerted effort bringing the region's areas of strength together and the region should thus be an active player in the knowledge society. In the birth of the region, the HEIs were central as ports both importing and exporting knowledge to the region.

ØU, the regional cross border collaboration between 14 HEIs, and the activities and networks under its umbrella has played a important role in the creation of the region. The HEIs started their collaboration even before the bridge was built, and has in many ways been a pioneer in the development of the region. The HEIs supply knowledge to the vision of the knowledge economy-driven societies, and as such the Øresund Region can hardly be imagined without the HEIs. Today, ØU is active in a number of strategic alliances, the foremost being ØSR, founded and owned by ØU. Here, representatives from public authorities, private companies and the university sector meet to create better conditions for knowledge-based economic growth in the region. As described in the chapters 2 and 4, ØSR has experienced a rapid development in a short period of time and today the organization

is one of the strongest actors in the cross border regional set-up. The surrounding society has – through top-level representation and financial support – manifested their belief in and acknowledgement of the initiative as important for the development of the region.

ØSR is an extremely interesting example of collaboration between HEIs, industry and the society. The organization has experienced a rapid development since its start in 2001 as a project supported by Interreg. Already in 2005, it was established as a permanent organization, run by a board with top-level regional politicians, executives from the private sector as well as vice-chancellors from the HEIs. The level of enthusiasm found in the society has to some degree surprised the HEIs, which founded ØSR, but the process has definitely emphasized how important as “agents for change”, ØU is perceived – and has also demonstrated the willingness of the HEIs to engage in collaboration.

The HEIs also enter into other strategic alliances. RUC, for instance, has entered an agreement with the parties in what will become Region Sjælland after the Danish structural reform. RUC has committed itself to becoming “the university of Region Sjælland”. In Skåne, LU cooperates with Region Skåne to improve the innovation system in the region.

The HEIs continue to contribute in a number of areas – most directly through education of students and research as well as transfer of knowledge. At the same time the HEIs – through efforts to increase student mobility and educational co-operation – contribute to the integration of the Øresund Region, which has led to a “compression of space” with the Øresund Region:

Over the last couple of years, the triple-helix networks in the region have condensed. The impact of both ØU and ØSR has thus increased in the central part of the region (around the waters of Øresund) whereas the development to some extent has bypassed the more peripheral parts (Vestsjælland og Storstrøms Counties, Bornholm and nordöstra Skåne) of the region. The “compression of space”-thesis is supported by the fact that there can now be found a clear “Øresund”-effect on the economy and population in Malmö as well as the fact that the Medicon Valley-initiatives have brought the relevant actors in bio- and lifescience on both sides of Øresund together into one network.

The integration across the Øresund is strongest in the areas closest to Øresund. Here, the inhabitants are taking more and more advantage of the possibilities in the region. There is still some way to go before a common labour or housing market has been established, but as it is profitable taxation wise to live in Sweden and work in Denmark, this traffic is increasing. Slowly, also the mental barriers are broken down, although the medias in both countries still handle “Øresund”-issues from a national perspective thus maintaining stereotypes.

ØU has been an active player in this process as it has fostered contacts between academics on both sides of the Øresund as well as between HEIs and the surrounding society. Since knowledge workers are one of the most mobile groups in the region, ØU thus has contributed to the creation a large number of spearheads for the integration of the region. The exact numbers of students that study cross border is very difficult to measure, partly due to fact that it is a very heterogeneous group, partly because registration according to ethnic background does not take place. The number of students with a Swedish high school background at a number of prestigious study programmes at universities in Copenhagen is very high, touching 25% in i.e. medicine.

Through the university collaboration and the rapidly increasing mobility among students, the coming elites in both countries have made contacts and personal experiences with the other side of the region. This holds a significant potential for future developments in the region, both with regards to integration of labour and housing markets, but also with regards to the national policies concerning Øresund-issues. Some ten or twenty years from now, this will begin to manifest itself, should the positive developments of today continue.

The compression of space is not just about networks and mental barriers – it is also very much about the building of the bridge across the Øresund. With this fast and reliable – although still a bit pricey – connection, several companies in the region have had their home market expanded. With the shorter time of travelling, more face-to-face meetings take place and hereby a joint Øresund market is being created. A number of large infrastructural investments have taken place in the last 10-15 years: in addition to the bridge, motorway connections on both sides, new railway lines (in Denmark to Copenhagen Airport, in Sweden around Malmö), a new Metro in Copenhagen and the Citytunnel in Malmö are all results of the decision to build the region, and it is important to emphasize that these investments to no extent can be matched by infrastructural investments in the peripheral areas.

The HEIs also contribute to this development by increasing the concentration of highly educated people in the region. There is a very large labor market for university graduates in the Greater Copenhagen Area¹⁷⁰ and in Lund/Malmö. Many academics are employed at the HEIs and particularly in Copenhagen with the many state institutions (ministries, agencies etc), there is an increasing demand for highly educated people. The areas around the HEIs thus attract the students when they enroll at university, and afterwards the graduates find employment in the very same areas – for the centre part of the region, this can be labelled “brain-gain”, whereas the experience in the more peripheral parts is one of “brain-drain”. However, with the rising property prices in and around the large cities of the region, many families, among those academics, decide to move out of the city.

Visions and challenges:

- *Engage further in regional development*

The HEIs have already – through their involvement in Øresund University and Øresund Science Region – shown their commitment to the development of the Øresund Region. Furthermore, HEIs in both Denmark and Sweden are involved in developing both the Danish and Swedish part of the region. Today and in the years to come, the HEIs will become increasingly more important to society, both as suppliers of research-based knowledge and skilled graduates, but also as prerequisites for attracting inward investments. The HEIs should thus develop their engagement with society further in both a broader and a deeper sense.

But: the HEIs cannot lift this task without support from the society (both industry and public authorities), and society should thus recognize this important role and provide the HEIs and Øresund Science Region with sufficient funding to lift this important task.

- *Develop the Øresund Science Region*

More competencies to the Øresund Science Region is most likely to lead to overall better conditions for both research, development and innovation in the region. Øresund Science Region can – being the only cross-border network in these areas – play a major role in the much-needed simplification of the innovation systems.

- *Student mobility*

Lower prices for the students to cross Øresund will – isolated speaking – lead to more traffic between Denmark and Sweden. However, we believe that it will lead to a skyrocketing of numbers of students studying at the other side. This would have the most beneficial effect on the higher education system in the region, as the region would be closer knit together. Specialisation

¹⁷⁰ Almost 50% of all university graduates work in the Greater Copenhagen Area (Source Arbejdsmarkedsstyrelsen og Rambøll Management (2004): “Analyse af Akademikernes Arbejdsmarked”. Available (in Danish) at: <http://www.ac.dk/664>

of labor between the universities – be it through co-operation or competition – will lead to better quality and a more efficient use of the resources available today.

- *More investments in infrastructure*

With further improvements of the infrastructure, particularly to and from Copenhagen (more Metro lines, expanding of railway capacity, new motorways) the conditions for further growth in Copenhagen will be improved. Likewise, a lowering of the tolls for crossing the Øresund Bridge will lead to more dynamics and integration within the region – something that would benefit the society as a whole.

6.8. Visions for the Øresund Region

The previous chapters listed a number of visions and challenges. In this chapter we aim to present a coherent vision for the future of the Øresund Region. The vision comes into reality once the issues are solved, the barriers are lifted and the ambitions have realised.

In the present situation, different societal sectors in the Øresund Region are being woven together, also across the country border in the Øresund. Private and public actors on different levels are creating networks (formal and informal) with the university sector bringing together the two parts of the Øresund Region. The region does not become harmonised, rather, the differences of the two countries continues to exist, but the systems become more and more compatible. This creates a dynamic, European crossborder region in growth.

The vision takes off here and is further structured under three headlines:

- brain circulation
- infrastructure
- internationalisation

Brain circulation

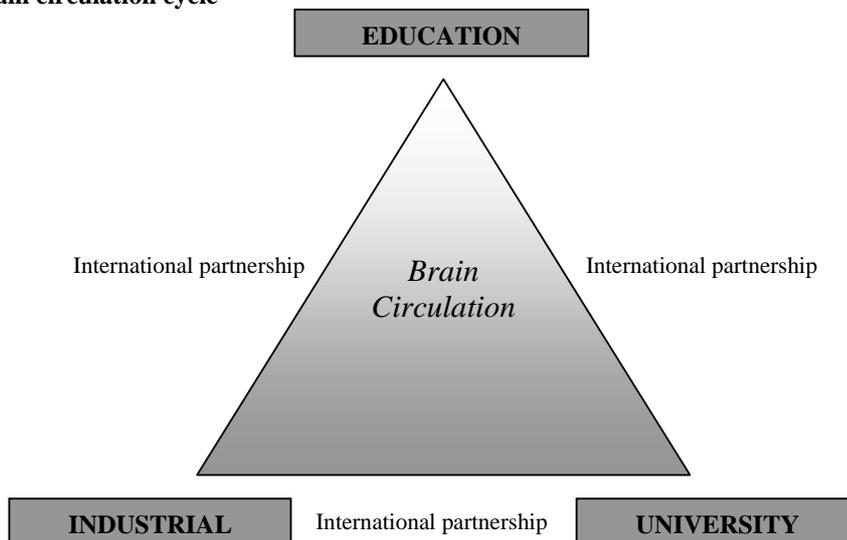
The Øresund Region is a place where many highly educated and skilled people work, research and live. In the knowledge economy it is a must for small countries like Denmark and Sweden to take advantage of the top capacities. Today swapping between different functions can be quite difficult. Making people able to do so in the future will provide organisations, HEIs, industry etc with the opportunity to benefit even more from the best researchers and teachers in the region.

To take even further advantage of the region's capacities could be done through what we will label "the brain circulation cycle". The brain circulation cycle is shown in the figure below. The idea is to have the bright heads circulate between different job functions at their wishes: university research, industrial research and education of students – and this could be at either side of the Øresund.

Using the brain circulation cycle means that persons working within one field can easily swap between different parts of their area. For a person working within the biotech area this could mean spending two thirds of the time in different research projects either commercial or at university level. The last third is then spent teaching at the universities in either Lund or Copenhagen. Using the brain circulation cycle would also make it much easier to take leave to for instance commercialize research findings for a year or two. In short, opening up for more integration between different job types in different sectors of society in different countries and a more integrated (or seamless) job circuit would make many more people, and the society at large, benefit from their knowledge and experiences.

An important part of the brain circulation is the international dimension. It is important for the region to be in the top league when comparing itself with the best regions in Europe and around the world. Thus, the brain circulation cycle should also focus on the development of research and skills abroad. An international exchange of ideas, research results and people is essential to keep the highest level.

Figure 6.1: **Brain circulation cycle**



Infrastructure as a prerequisite for the good life

In the knowledge economy as ever before, infrastructure is of the outmost importance. The Øresund Region holds an urban centre along the shores of Øresund, and some more rural hinterlands east and west of the centre. The region is characterized by a number of small and medium-sized cities (50,000-250,000 inhabitants) encompassed by areas of forests, fields, lakes and the seaside. Nowhere in the region one will find the sea further away than one hour's drive. Even in the large urban areas, belts of forests and green areas have been preserved due to good planning.

Compared to most areas in the world the distances within the region are relatively small. This makes it possible for people to live in beautiful, relaxing places on the countryside and work in the city. The mixture between the bustling city life and the relaxed atmosphere of the countryside is of great value when it comes to attracting people and businesses to settle in the region. By offering the "good life" to more people in the region, the region will become even more attractive.

By connecting the rural hinterlands and the urban centres better together than today, the region will be able to offer an extremely active mixture of countryside and city. Here, high speed train like the French TGV or the Japanese Shinkansen could be the key to upgrade the region. High speed trains connecting Copenhagen Airport with the northeast of Øresund SE or the southwest of Øresund DK would cut travel time to just one hour! Imagine the possibilities for leisure and relaxing just one hour away from the metropolis... With improved infrastructure, the inhabitants of the region will never have to choose between the city and the countryside – they simply get the best of both.

Also virtual infrastructure could be improved. Wireless, high-speed broadband access to every citizen in the region is a public good in the knowledge economy like the tarmac roads were in it the fordist economy. Further,

turning the region into a digital hothouse could attract many international IT-companies – besides Nokia and Ericsson that are already present today. This is taking the vision of Crossroads Copenhagen and applying it to the whole region.

Improving infrastructure is also about contributing to the development of the region's peripheral areas. More flexibility in both the "business" and the "pleasure" part of everyday life will give the rural parts better opportunities of attracting people to settle and companies to locate. Further, a region with 3.5 million inhabitants needs a strong centre and a resourceful periphery with a skilled population and good places to live.

In short, we believe the improved infrastructure (physical and virtual) to be of importance for knowledge workers, and thus the companies that wish to employ them. Improving the "good life" and the number of people living it in the Øresund Region is improving the international competitiveness of the region. Improving the infrastructure does part of this.

Internationalisation

The Øresund Region is only 10 years old or so, and it is largely unknown outside of Northern Europe. Of course this is a major hindrance when competition with regions bearing more well known names. The continued branding of the region internationally is extremely important.

In a globalizing world, also the HEIs become actors on an international stage. Competing for the best researchers and students is the reality already today, and the competition is likely to become even harder.

One of the flagships of the collaboration within ØU is the international summer university. At present, it is small in scale, but increasing the size and attracting even more international students could help position the region as one of the knowledge centres of Europe. The summer university could even be enlarged with a Ph.D summer school giving some of the best and brightest students of today the chance to get familiar with the region. During the summer school, the students should also learn about how to do business in the Øresund Region, and match-making between students and the region's industry should be arranged. The inflow of gifted Ph.D students is necessary to upkeep the large amount of R&D in the region in the future.

Summing up – the vision at large

Bringing the dynamic cross border region even further includes introducing more flexibility in the working life (the brain circulation), improving infrastructure allowing more people to live the good life and attracting the best brains from all over the world to work, research and live in the region.

This creates a highly attractive region with a high quality of life, solid contacts and collaborations between different societal sectors at different levels in both countries. The Øresund Region has the potential to become a frontrunner in the knowledge economy of a globalizing world.

APPENDIX.

A1 : The platforms of Øresund Science Region.

Medicon Valley Academy

A detailed description of Medicon Valley Academy is given in the case study in section 4.4.3.

Øresund IT Academy

Øresund IT Academy is a not-for-profit network organization uniting Danish and Swedish IT actors centered on the Øresund IT cluster. The aim is to make the region more attractive by facilitating access to knowledge and contacts. Supported by the region's fourteen universities, national and regional authorities as well as numerous companies and venture capitalists, Øresund IT Academy is a catalyst for new business and projects. The aim is to combine the competencies from the Swedish and Danish systems while also linking into the sister platforms within medico, food, environment, logistics and design.

Øresund Environment Academy

Øresund Environment Academy is too an organization that forms a link between academic research, the business community and the public sector in the Øresund Region. The aim is to enhance environmental skills and to promote environmental research and innovation. In partnership with other organizations, Øresund Environment Academy aims at co-ordinate and integrate environmental initiatives in the region and at promoting sustainable development. Øresund Environment Academy arranges seminars and conferences, initiates and co-ordinates projects related to environmental business, education, policy and research.

Øresund Design

Øresund Design's mission is to create a platform for design activities in the Øresund Region strengthening the competencies in purchasing and selling design. Øresund Design has identified a number of areas of competence lacks among the buyers and sellers of design, which different projects are established to deal with. These are related to networking where design is a key element. Øresund Design works with establishing networks among the several groups within Øresund. Another important issue is to market Øresund Design Society regionally and internationally. Øresund Design cooperates with a great number of organisations to establish the brand Øresund Design regionally and internationally. Øresund Design has the assignment to market what the region holds within design. Education is the third area, where strengthening design education and research could create positive spin-off. Øresund Design is conducting a survey of the design education programs and design research within the region. Finally more innovation is a main focus area for the Øresund Design Platform. Øresund Design has two tasks within innovation; develop new tools for design implementation in innovation support organisations, and create co-operations of "open innovation-projects" together with the other platforms within Øresund Science Region.

Øresund Logistics

On initiative by the region's universities, the business and the public sector the Øresund Logistics was formed in the summer of 2003. The background for the platform was the wish of supporting the logistic development in the region. This should have a number of positive side effects: First of all lowering the cost of transportation by connecting the infrastructure and logistic systems on both sides of Øresund. On the other hand collaborating could have a positive impact on the environment, not just in the Øresund Region but also in the whole of Scandinavia and the Baltic Sea Region. Øresund Logistics co-ordinates network activities, spreads knowledge on logistics; initiates research activities and market the Øresund region as *The Nordic Main gate*. Through increased collaboration across Øresund, new, intelligent logistic solutions and the establishment of well-planned infrastructural elements a development towards becoming the main gate are on the way.

Øresund Logistics has established a network, which consists of 1.200 persons, which represents approximately 500 businesses. The network is made up of logistic companies, organizations, consultants, public actors, universities along with the Copenhagen Airport and a number of large international companies (like DHL, Sony Ericsson and Carlsberg).

Øresund Food Network

The Food Complex is one of the largest business sectors in the Øresund Region and the world, exporting to over 150 markets and contributing to economic growth and employment in Denmark and Sweden. The region's universities, institutions etc. house a wide range of science-based competencies essential for the food production chain. Together they cover, and have extensive experience in knowledge and technology transfer all the value adding steps "from stable to table". This cluster holds the only "Major Research Infrastructure" designated by the EU within the food area.

Øresund Food Network provides a forum for research collaboration and knowledge exchange, supporting innovation and the exploitation of ideas. They organize seminars and workshops, identify and initiate research projects, and disseminate information. Øresund Food Network has detailed databases of contacts in the region and it facilitates necessary interactions with the political and administrative levels. As part of Øresund Science Region, the network benefits from a multidisciplinary environment in general, and particularly through close cooperation with Øresund University and the other ØSR clusters. More than 450 persons participate in the network.

Nano Øresund

Nano Øresund aims at bringing together nanotechnology strengths in innovation, education, research and laboratory infrastructure on the Danish and Swedish sides of Øresund, to bring out the full potential of the region in this field. A primary objective is to provide the base for all aspects of nano technological co-operation in the region, where academia and industry participate, and also to communicate Øresund's capacity in these terms internationally.

Nano Øresund's objective is to increase the application of nanotechnology in industry, and also to promote the startup of companies centered around nanotechnological solutions and developments. The foundation for nanotechnological innovation is secured through cooperation with industry, academia and technology transfer functions. We believe that close communication with industry is the necessary prerequisite for more efficient technology transfer and innovation.

Dignet Øresund

Dignet Øresund is a network and a forum for the digital entertainment industry (Games, Film, Learning and Entertainment) in the Øresund Region. The object of this network is to contribute to the economical growth by promoting the development, the production, the distribution and the selling of digital entertainment products, e.g. computer games, new film formats, interactive tv, mobile content, edutainment, e-learning etc.

Dignet is a bridge builder and a matchmaker between the universities and the business community. Dignet channels new ideas, research and development as well as new talents to the players. The targets groups are Researchers & Students; Companies & Organisations; Entrepreneurs & Contractors; Creative players, Free Agents & Talents. The objectives are: New insight; New business opportunities; New alliances; and improved framework conditions.

The Humanities Platform

The faculties and institutions of Humanities at Lund University, Malmö University, University of Copenhagen and Roskilde University have formed a platform of collaboration inspired by the industrial platforms in Øresund Science Region. The Humanities Platform aims at establishing and strengthening ties between the universities, the local, regional and national authorities, and the cultural and arts institutions in the Øresund Region. The Humanities Platform has successfully applied for support from the Interreg IIIA-Øresund Programme. The platform has launched several initiatives to create linkages between the universities, business, society and government in 2005.

Furthermore, the four HEIs have a yearly festival – the Humanities Festival – where the faculties and departments arrange a large number of activities such as seminars, performances, art exhibits, film showings etc. This festival originates from Lund University, but has with the increasing collaboration within the Humanities Platform, also taken place at the other universities the last couple of years.

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Further information

Although every effort has been made to secure that the information in this report is concise and up-to-date, newer and sometimes more precise information may be available.

A list of web sites and organisations that provide information about the contribution of HEIs to regional development in the Øresund Region:

Organisation	Description	Web site
Øresund University	Information about the 14 universities in the Øresund Region, including links to the member universities. Also the international summer university, Øresund Summer University, and the study information portal, Øresund Study Gateway	www.uni.oresund.org www.summeruniversity.org www.studygateway.org
Øresund Science Region	Information about the triple-helix networks in the Øresund, including links to the 9 affiliated platforms	www.oresundscienceregion.org
Ministry of Science, Technology and Innovation (DK)	Responsible for university education and research in Denmark	www.vtu.dk English website: http://www.videnskabsministeriet.dk/cgi-bin/news-archive-list.cgi
Ministry of Education and Culture (S)	Responsible for higher education in Sweden	www.utbildning.regeringen.se
National Agency for Higher Education (S)	Publications and statistics about higher education in Sweden	www.hsv.se/en
Ministry of Education (DK)	Responsible for university colleges in Denmark	www.uvm.dk www.uddannelsesstatistik.dk
The Danish Rectors' Conference (DK)	The conference for the vice-chancellors of the 12 Danish universities. Statistics and publications about the university sector	www.rektorkollegiet.dk

The Greater Copenhagen Authority on Øresund	The Greater Copenhagen Authority is responsible for co-ordination Øresund affairs in Denmark	www.hur.dk/oresund
Region Skåne on Øresund	The regional authority for the Swedish part of the Øresund Region	www.skane.se/oresund
The Øresund Committee	Consists of local and regional politicians in the Øresund Region; houses the administration of the Interreg III Øresund -programme	www.oresundskomiteen.dk
The Øresund Institute	Provides analysis about the development in the Øresund Region	www.oresundsinstittet.org
Øresund Network	The region's branding organisation	www.oresundnetwork.com
Øresund Direkt	Provides information to the region's citizens on the possibilities in the other part of the region	www.oresunddirekt.org