



LUND UNIVERSITY
School of Economics and Management

Department of Economics

Master Thesis

Date: January 28, 2011

The Growth Potential of the Öresund Region - a Demographic and Labour Supply Perspective

Supervisors:

Inga Persson
Mårten Walle

Author:

Assem Bektur-Giversen

Opponent:

Sofie Bredberg

TABLE OF CONTENTS

1. INTRODUCTION.....	3
1.1 AIM OF THE THESIS	4
1.2 METHODOLOGY AND DATA	5
1.3 OUTLINE	6
2. DETERMINANTS OF ECONOMIC GROWTH	6
2.1 THE ROLE OF LABOUR SUPPLY	6
2.2 LABOUR SUPPLY: THE QUANTITATIVE DIMENSION	7
2.3 LABOUR SUPPLY: THE QUALITATIVE DIMENSION	8
3. THE DEMOGRAPHIC PROSPECTS OF THE ÖRESUND REGION.....	10
3.1 THE POPULATION OF THE ÖRESUND REGION	10
3.2 POPULATION AGEING	11
3.3 IMPLICATIONS OF THE DEMOGRAPHIC PROJECTIONS.....	13
4. LABOUR SUPPLY – DIFFERENCES AND DETERMINANTS	14
5. HUMAN CAPITAL INVESTMENTS – DIFFERENCES AND DETERMINANTS.....	20
6. POTENTIAL GAINS FROM INTEGRATION	24
LIST OF REFERENCE	29
APPENDIX	32

1. Introduction

The Öresund Region is a bi-national region, with the greater Copenhagen area on the Danish side and the Malmö/Lund area on the Swedish side making up its centre in terms of population, economy and culture (Figure A1 in the Appendix).

On July 1, 2000 the Öresund Bridge officially opened as representatives from the Danish and Swedish royal families met at the mid-point of the Bridge. The opening of the fixed link across Öresund culminated a century-long process, and resulted in a speed-up of the integration process of the region. The fixed link gave a potential to new regional development in the Öresund Region. It developed the first cross-national integrated large city region outside the European centre (Matthiessen, 2000).

The bridge has had a powerful impact on the everyday lives of the regional inhabitants by offering them the possibility to commute easily, thus extending their cultural, educational, commercial, employment, and housing opportunities.

But the regional development of Öresund did not stop just on creating a fixed link between the two sides. On Dec. 4th 2010 H.M. Carl XVI Gustaf, the King of Sweden, officially opened the City Tunnel. City Tunnel is a railway project that will benefit the Öresund Region, since it creates a fast and effective link between the major rail routes in Southern Sweden, as well as in Öresund Region.

Not surprisingly, the construction of the bridge and the opening of City Tunnel attracted a great deal of attention throughout the two Scandinavian countries, which, in its turn, resulted in a number of scientific articles and increased research.

According to the Öresund Committee, the Öresund Region is an important hub for economic activity in Scandinavia. In 2008, about 20,000 persons commuted daily between home and work across the Öresund (Tables 5 and A9 in the Appendix). The clear majority, 18,000, commuted across the Öresund Bridge (Figure A8 in the Appendix). Commuting across Öresund has increased six-fold since the opening of the Öresund Bridge in 2000.

According to Matthiessen and Schwarz (1999),

“an integration of Greater Copenhagen and the Malmö-Lund agglomeration gives the two hitherto non-interdependent urban economies access to more specialization and opens them up for cooperation as yet unforeseen”.

In many respects Copenhagen and the Southern Swedish centres are expected to experience increased economic growth. Matthiessen and Schwarz (1999) measured that Copenhagen ranks 21st in Europe, whereas Malmö-Lund is situated just inside the top 30 in terms of scientific output; but when the two urban areas are combined, they rank 5th. The same goes for gross regional product: Copenhagen ranks 19th amongst European cities, but combined with Malmö-Lund it moves up to 11th place.

Integration of the region might help these two nations in the long run to cope with some of the forthcoming challenges, one of which is population ageing. This demographic challenge puts both Denmark and Sweden under the risk of slower economic growth, labour shortages and increasing public expenditures that would have to be financed either by significantly higher taxes on a smaller number of workers or by substantial cuts in social security benefits and/or social services. So, a central question for both countries is how the labour supply can be expanded over time to compensate for an older population. It is worth mentioning already here that the population development in the two countries is projected to differ (OECD Statistics) and with the help of the integrated labour market these differences in the growth of population might be turned into a regional strength.

It is interesting to analyse the future prospects for growth in this region. From economic theory, it is known that economic growth in the short run is determined mainly by labour demand; whilst, in the longer perspective, it is determined by the labour supply. So it is possible to say that in the long run it is labour supply together with labour productivity that determines growth. Thus future economic growth in the region will depend on demographic developments, the development of labour supply and on how effectively the labour markets on both sides of the Link and their integration are working, as well as on labour market and educational policies implemented by the governments.

1.1 Aim of the thesis

Against this background the aim of the thesis is to analyze the growth potential of the Öresund region from a demographic and labour supply perspective. When it comes to Copenhagen, it is not situated in sufficient proximity to the other large Danish cities. It is, however, close to Malmö and Lund, which could potentially provide promising synergies. That is why the goal of this thesis is to identify these potential pros of a cross-border coalition of the two countries and to establish what could be done to make the Öresund region work for the best of both countries. The focus of the analysis will be on demography, labour supply, and human capital.

1.2 Methodology and data

The data is mainly taken from the Ørestat databank, which is a databank of statistics on 13 subjects covering the Öresund Region (i.e. the Eastern part of Denmark and Skåne in Sweden).

Data from Statistics Denmark and Statistics Sweden has also been used; these are the central government agencies responsible for producing official statistics on Denmark and Sweden, respectively.

It was decided to choose these sources because they are accurate, complete, compatible and available for different time periods to see the development over time, as well as various variables. It is also highly reliable and unbiased.

In addition to that, various economic literatures have also been used, as well as different scientific articles on the areas that are relevant to the research questions.

It is also worth mentioning some technicalities of this research.

According to the official web portal of the Öresund Region, the Region comprises the islands of Zealand, Lolland–Falster, Møn, and Bornholm on the Danish side and Scania (Skåne) in Sweden (Fig.A2), which is the part on the eastern side of the sound. In this paper it was decided to concentrate the attention on the Greater Copenhagen Area (Region Hovedstaden) and the city of Malmö when considering the Öresund Region; thus, it has been decided sometimes not to include the northern and eastern Scania, as well as areas in the western and southern Danish parts of the region. Though it is worth mentioning that this should not make the results differ greatly, since the omitted parts of the region have a relatively low population density, whereas the central Copenhagen-Malmö area is the most populous and most densely populated urban area in Scandinavia with approximately 2.5 million inhabitants. The Greater Copenhagen Area is an administrative region of Denmark. This administrative region was established on January 1, 2007 as a part of the 2007 Danish Municipal Reform. The new Region Hovedstaden consists of the municipalities of Copenhagen and Frederiksberg, the former counties of Copenhagen and Frederiksborg, and the regional municipality of Bornholm.

It should also be mentioned that the data and the analysis provided by the Örestat database before July 2005 were erroneous. That is why the analysis and results in this paper differ somewhat from the one provided by the Tendens Øresund database.

1.3 Outline

The structure of the thesis is the following:

Section 2 presents the determinants of economic growth according to the theoretical economic model. Here, the labour supply, as the determinant of economic growth, its qualitative as well as quantitative dimensions will be considered. Demographic Prospects of the Öresund Region will be covered in Section 3, where the problem of population ageing and the implications of the demographic projections will be presented. The next two Sections will analyse the differences and determinants of labour supply and human capital investments. Section 4 presents the economic theories of labour supply: labour force participation, hours of work supplied. Section 5 presents the theory of investments in human capital. Section will summarize the prospects of labour market integration, thus it will give the concluding remarks regarding the growth potential of the Öresund Region.

2. Determinants of Economic Growth

In this part the role of labour supply, quantitative (including demographics) as well as qualitative (human capital) dimensions of it, as the determinants of economic growth, will be discussed. A number of mechanisms through which regional integration can lead to higher growth rates will be identified.

2.1 The Role of Labour Supply

The individuals face a decision of whether to participate in the labour market, which job to choose, how many hours to work and how much effort to impart. These decisions together with the demographics of the population will determine the actual labour supply provided in the region. According to economic theory, it is the labour supply (besides the capital stock and technical progress) that is crucial for economic growth in the long run, whilst in the short run economic growth is determined mainly by labour demand.

Since the main aim of this paper is to find out what is the growth potential of the Öresund Region, it is necessary to consider the long run.

The first important issue in the long run is that of the size and structure of the population. How they change over time determines the labour supply potential of the region in question. Thus, the role of the quantitative dimension of the labour supply in economic growth should be considered.

This includes both the demographic dimension and that of the individuals' decisions about labour force participation and hours of work. However, the latter will be treated in depth later on in Section 4. At given demographics, and quantitative labour supply decisions the next issue is that of the capacity or skill of the resultant labour force, which depends upon such things as training and education, thus, adding an extra qualitative dimension in the long run. Such training and education decisions are the focus of human capital theory. There are, thus, also decisions about how much investment to undertake in education and training that are crucial for economic growth.

2.2 Labour Supply: the Quantitative Dimension

A large stream of recent literature has stressed the importance of demographic dynamics in understanding economic growth. The impact of population on economic growth was debated throughout history. Perhaps only one common conclusion that follows is that population and its growth play a crucial role in determining a country's level of per capita income. The Malthusian and Solow models provide two ways of analyzing how population affects growth. According to Malthus, countries with populations that are large relative to their natural resources will be poorer. The Malthusian model of population implied that the size of the population would increase until the level of income fell to the point of zero population growth. But starting around 200 years ago in the most developed countries the Malthusian model no longer applied, since income has risen far above the level that would constrain population from growing. So, the Malthusian mechanism has broken down as population growth and income per capita have risen to levels never before seen in history (Weil (2005), p.113).

The Solow model, on the other hand, looks at how capital affects output to see how the growth rate of population interacts with the quantity of capital to affect income per capita. Countries with populations that are growing rapidly will be poorer because of the effect of capital dilution, according to the Solow model. In the Solow model technology is assumed to be exogenous and through enhanced efficiency as a consequence of increased regional integration there could be a once-off static growth effect on the production level. Regional development could not be shown to result in long-run growth effects.

There are other ways, as well, through which demography affects a country's economic situation. Among others, Williamson (2001), Bloom, Canning and Sevilla (2003) and Mason (2003) point out that the increasing life expectancy and declining fertility rates generally associated with the demographic transition lead to significant change in age structure as the baby

boom generation works its way through the age structure. Falling fertility rates may also affect labour supply decisions, particularly female labour supply.

It is known that the change in fertility and mortality shape the age (and sex) structure of a population. The change in the age of population, in its turn, results in demographic transition. The Demographic transition model (DTM), which was developed in the 1930s, tries to explain the process that transformed countries from high birth rates and high death rates to low birth rates and low death rates as part of the economic development of a country. Most developed countries are beyond stage three of the model, where, among other social changes, birth rates fall due to access to contraception, subsistence agriculture is reduced, wages and urbanization are increased; it is also described by an increase in the status and education of women, a reduction in the value of children's work, and an increase in parental investment in the education of children. So, population growth begins to level off. An increasing number of researches have shown that in most economically developed countries the share of the population that is of active age is, indeed, declining. The share of people in active age declines both due to low fertility and longer life expectancy. A larger part of a cohort than before reaches 65 years of age and those who reach that age have more remaining years of life than earlier cohorts. This demographic development may result in a phenomenon dubbed "population ageing", which is a shift in the distribution of a country's population towards older ages. It is important to note that both Denmark and Sweden are facing this phenomenon.

An ageing population leads to some crucial challenges that a country might face in the future. Amongst others, it results in a risk of lower economic growth, labour shortages and rising public expenditures. Hence, unless the labour supply of the active population can be increased, a government needs either to impose significantly higher taxes on a smaller number of workers or to significantly cut the social security benefits and/or social services.

In the face of these forthcoming demographic challenges it is interesting to analyse how the integration of the Öresund Region can help in overcoming future demographic transition imbalances. Integration of the Öresund Region may have some potential. Thus, with the help of the integrated labour market the future imbalances of the population might be turned into a regional strength. This will be further analyzed in Section 3 below.

2.3 Labour Supply: the Qualitative Dimension

In the production of wealth the productivity of the workers is of as much importance as their numbers. Here, the health and strength of the population are of primary importance. But there are

also other issues, such as physical and mental quickness, thoroughness and exactness, and others. That is, each worker brings into the labour market a unique set of abilities and acquired skills that are defined as human capital.

Parents' choice to invest more in each of their children has important implications. Children who receive more education and better health care are likely to be more productive workers as adults, according to human capital theory, and this increase in the quality of workers is an important contributor to economic growth. The same goes for the adults' decisions to invest in their human capital.

In general, increasing skills can lead to restructuring of production towards activities with higher value added. The right training can boost the likelihood of success as an entrepreneur. Higher-skilled workers might be more flexible and able to adapt more easily to new environments. Human capital is important for R&D, both in undertaking research but also in having the skills and knowledge to implement new technologies and methods in the workplace.

Shortly, according to the theoretical literature, human capital would affect economic growth in two ways: through directly participating in production as a productive factor and through contribution to raising technical progress through increased innovation and adoption of new technologies.

Lucas (1988), inspired by Becker's (1964) theory of human capital, emphasizes human capital *accumulation* as a source of sustained growth, an alternative to technological change. According to Lucas (1988), there are two main sources of human capital accumulation, namely education and learning by doing. The differences in growth rates across countries are mainly attributable to differences in the rates at which those countries accumulate human capital over time.

Another approach to analysing the relationship between education and growth was given by the seminal contribution of Nelson and Phelps (1966). In their framework, economic growth is primarily driven by the *stock* of human capital. Human capital is important to productivity performance for a number of reasons. Nelson-Phelps approach predicts that "productivity growth and the rate of innovations should increase with the level of educational attainment, and particularly with the enrolment in secondary and higher education that best reflects the number of potential researchers/developers in an economy." (Aghion and Howitt (1999), p.339). The empirical evidence (Barro and Sala-i-Martin (1994), Benhabib and Spiegel (1994)) supports that there is a significant impact of the level of secondary and higher education attainment on the rate of productivity growth. Nelson-Phelps approach also predicts that the marginal productivity of educational attainment is an increasing function of the rate of technological progress.

Technological progress itself reflects both the innovation rate and the speed at which individuals and firms adapt to new technologies.

Thus what the advantages of a regional integration for Denmark and Sweden are from a qualitative labour supply viewpoint is of a great interest here. Regional integration means access to a wider knowledge base compared to isolated countries, that is, prior to formation of the Öresund region. The size of an aggregate knowledge base affects, as it is known, the rate at which the new knowledge is generated, which in turn leads to a higher long-run growth rate.

It is worth mentioning that regional integration also widens the available alternatives of an individual when it comes to human capital investments. Thus, individuals will have larger variety of institutions available for him/her to choose from.

Another aspect of the integration of the region to be considered is the labour mobility within the Region. Regional integration implies that employers can seek the most skilled labour within the region to accomplish the tasks of the firm. This results in a positive sum game, that is, labour gets the best possible wage, while the firm gets the best possible product or service for its market. The resulting efficiency in the market may lead to higher long-run growth rate.

3. The Demographic Prospects of the Öresund Region

As discussed above it is the size and structure of the population that determines the labour supply potential of a region. That is why this Section will thoroughly discuss the demographic prospects of the Öresund region. As is known, the fertility rate, mortality rate and migration are important for establishing the demographic prospects of the Region, which is why they will be covered in this Section. Only by gaining a better understanding of the factors of the demographics and the channels through which they interact one might be able to make informed projections of the potential of the Öresund region.

3.1 The Population of the Öresund Region

At the turn of the year 2008-09 the Öresund region had 3 698 199 inhabitants (Table A1). From Fig. A3 it can be seen that the population of the Öresund Region has been growing extensively since the cross-border link between the two countries was established. Thus, the population of the Öresund region grew from 3 536 681 in 2000 to 3 698 199 in 2008.

There are roughly 2 483 000 individuals living in the Danish part and 1 214 800 in the Swedish part. The population in the Öresund region is concentrated around the Öresund Bridge with the majority on the Danish side, as can be seen from Table A1 of the Appendix. There are approximately 500,000 individuals living in the City of Copenhagen, and 281,000 inhabitants in Malmö. The Greater Copenhagen Area is home to 1.2 million people.

3.2 Population Ageing

One of the most important ongoing demographic changes is the ageing of the world's population, i.e. an increase in the proportion of older people. Over the next 50 years, the median age of the global population is forecasted to rise by almost 10 years, from 26.5 to 36.2 years, according to the United Nation's Population Division. This ageing results from both declining mortality and declining fertility. In the more developed countries, the fraction of the population made up of children has already fallen significantly and is forecasted to fall only slightly more over the next 50 years. But the fraction of the elderly population is rising dramatically. In fact, the mortality began to fall already during the middle of the eighteenth century in England, France, North America, and Scandinavian countries and continued during the nineteenth century. In the twentieth century the decline expanded worldwide and is still continuing growing. The EU population is projected to become older with the median age rising from 40.4 years in 2008 to 47.9 years in 2060, according to Eurostat's latest population projection scenario (EUROPOP 2008, convergence scenario). Of course, an increase in the proportion of older people is a result of significant economic and social progress, better healthcare services that enable people to live longer, more comfortable, and secure life.

However, there are also negative consequences of the ageing of population, as discussed by politicians and economists for quite a while. Population ageing would place substantial pressures on public finances and reduce countries' overall growth. It is, however, argued by some economists that the negative consequences of ageing could be offset by policies to encourage higher fertility, greater immigration or faster productivity growth.

Current population forecasts from Statistics Denmark and Region Skåne show that the population of working age in the Danish Öresund region, and particularly in the Capital Region of Denmark, will drop within the next few years. The number in the cohorts who reach retirement age exceeds the number in those cohorts who are entering the ages of the active working population. This gap will lead to a reduction of the potential labour force.

Table 1 below shows the forecast of the Öresund's population, according to the Öresund Committee:

Table 1. Population Forecast of the Öresund Region (number of individuals)

Year	Population 1 January	5-year period	Average annual change		
			Total	Öresund DK	Öresund SE
1999	3,503,576				
2004	3,583,302	1999-2003	16,523	10,826	5,697
2009	3,698,199	2004-2008	18,877	8,024	10,853
Forecast					
2014	3,796,371	2009-2013	22,744	8,383	14,361
2019	3,884,068	2014-2018	17,671	6,290	11,381
2024	3,971,404	2019-2023	17,507	6,836	10,670
2029	4,052,226	2024-2028	16,583	6,598	9,985

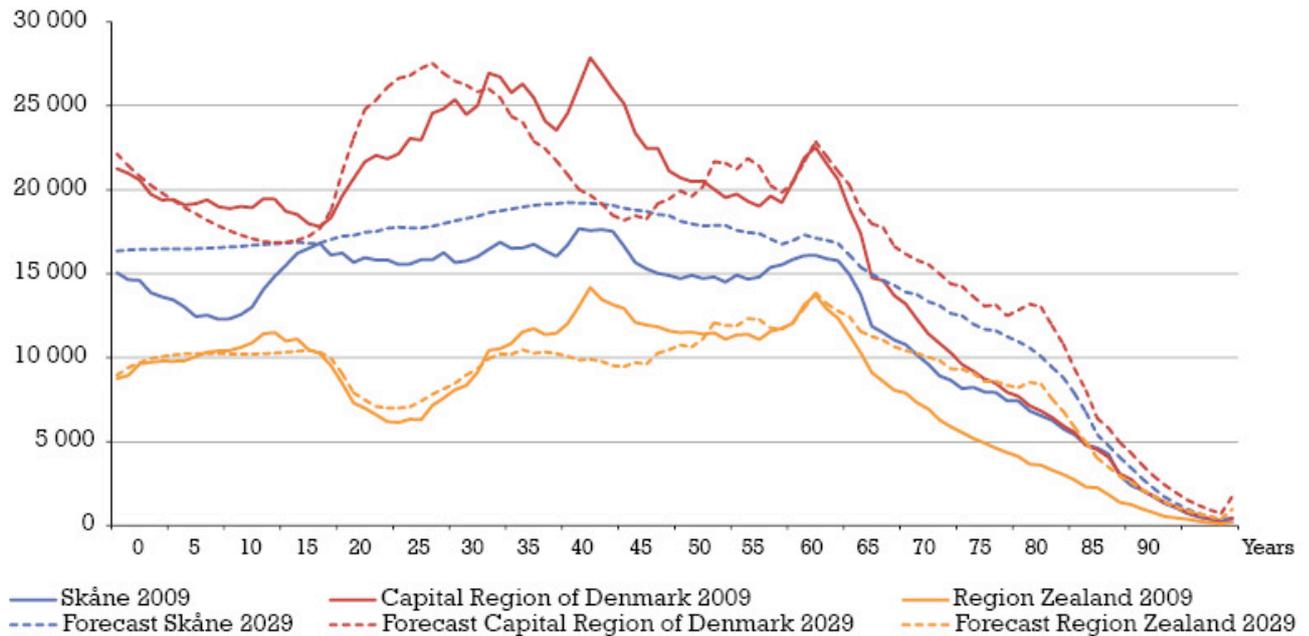
Source: Statistics Denmark and Region Skåne. Processed by Region Skåne

According to this table, Öresund's population is expected to increase from 3.7 million inhabitants to approximately 4 million inhabitants by 2029. It can also be noticed that the population on the Swedish side of Öresund increases more dramatically, while the population on the Danish side increases relatively weakly. During the forecasted period the rate of the population increase on the Danish side, as well as on the Swedish side of Öresund is expected to decrease. However, the Swedish side of the Öresund starts off with a population increase rate at a much higher level.

It is noteworthy that the population of a geographic area grows or declines through the interaction of three factors: fertility, mortality, and migration. To project population size at a future date, demographers make assumptions about levels of fertility and mortality and about how many people will move into or out of an area before that date. The net population increase or decrease over time is added to the "baseline" population to project future population. So, the projected decrease in the rate of population growth in Skåne is due to the assumption of reduced refugee and family member immigration.

Figure 1 below depicts the forecast of the population's age structure. The percentage of elderly is expected to increase in the entire Öresund region, according to figure 1. The reason for that is the baby boom that took place after the WWII period. The persons born in the 1940s comprise a very large group on both sides of Öresund. The demographic structure changes sharply when this group becomes older. But it is worth mentioning that the largest increase in the percentage of elderly is predicted on the Danish side of Öresund.

Figure 1. Forecast of Population Age Structure



Source: Statistics Denmark and Region Skåne. Processed by Region Skåne.

Speaking of the population of the working age, 20-64 years of old, it could be mentioned it will fall by about 40 000 persons on the Danish side of Öresund by 2029, whereas the population in Öresund SE is projected to increase by about 90 000 persons in the same age group. What is important here is the fact that the dependency ratio will still be increasing, thus offsetting the positive population projections for the Swedish side of the Öresund. In other words, the amount of people dependent on the gainfully employed group of population will be increasing.

3.3 Implications of the Demographic Projections

From Fig. A3 it can be seen that the population of the Öresund Region has been growing extensively since the cross-border link between the two countries was established. And the projections of the population up until 2029 indicate that an increase is expected in the future. At the same time, current population projections given by Statistics Denmark and Region Skåne show that the population of working age on the Danish side of Öresund will decrease in the next few years, whereas the percentage of elderly is expected to increase in the entire Öresund region. This gap between the growing amount of elderly people and a decreasing amount of working age population will lead to a reduction of the potential labour force.

The demographic projections summarized above show that both sides of the Öresund face challenges in terms of population ageing. Though, the Swedish side of Öresund region is doing relatively better in terms of population projections. The increased percentage of elderly will post

a risk on both sides of Öresund region, which might result in a risk of slower economic growth, labour shortages, and rising public expenditures.

However, the integration of Öresund region brings a great potential for the region. The negative trend of population ageing can be partly overcome by other economic effects of regional integration, such as increased possibilities for commuting from the border region of Skåne, and labour immigration from Eastern Europe (Poland, for example).

Demographic pressure on the Danish side can be eased through the differences in demographic developments, i.e. when it comes to the population of the working age. The differences mentioned in Section 3.2 mean that the integration might open up for an “evening out” of these differences.

It is important to note that the population projections and their assumptions presented in the previous sub-section are provided by the Danish and Swedish authorities, thus, they are exogenous factors to this research and should be considered as given.

Given this exogenous expected population changes that project labour supply potential, we now turn to the actual labour supply in the Öresund region.

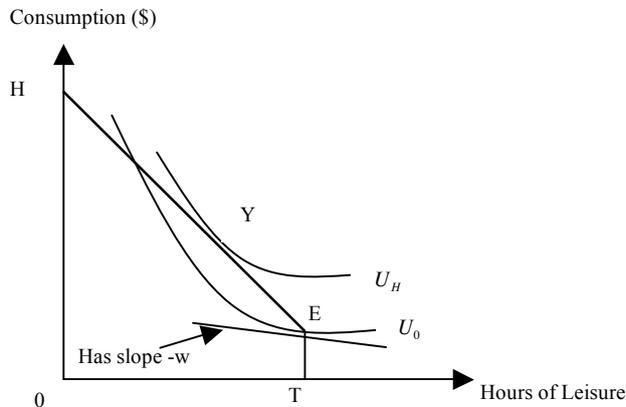
4. Labour Supply – Differences and Determinants

In many ways, Danish and Swedish labour markets resemble other labour markets in Europe, but a number of features of the Danish and Swedish labour markets differ from those of the others. Some of these differences apply to other Nordic labour markets in general, while others are more uniquely Danish or uniquely Swedish. In this part of the paper the main goal is to analyze the labour supply on both sides of the Öresund region with emphasis on the areas in which both sides are alike and differ. This section summarizes some of the key trends in labour supply in the Öresund region, from which the opportunities for higher economic growth can be determined.

The labour force is defined, as that part of the population, which presently has a job, is self-employed or is willing to and actively looking for work. The size of the labour force depends on demographics, that is, the size of the population, its age and gender distribution, as well as on the individual desire to work. The latter depends on the net benefit from working compared with the net benefit from non-working. The higher is the income from working, the higher is the incentive to work, and vice versa.

Thus, the theory of labour supply predicts that there is a positive relation between the person's wage rate and his/her probability of working (for ex., G.J.Borjas, 2005). Figure 2 below, shows the reservation wage that keeps the worker indifferent between working and not working.

Figure 2. Labour-Leisure Choice



Note: the figure is taken from G.J. Borjas, 2005, Ch.2, p.41)

The provided analysis of the graph is taken from Borjas (Ch.2, 2005). If the person chooses not to work, he/she can remain at the endowment point E and get U_0 units of utility. At low wage the person is better off not working. While at high wage, a person is better off working. The reservation wage, given by the slope of the indifference curve at the endowment point, typically depends on the person's taste for work, as well as on many other factors. The theory of labour supply implies that high-wage persons are more likely to work. A rise in the wage rate, in its turn, increases the labour force participation rate.

The theory of intertemporal labour supply predicts that labour force participation rates should be the highest when the wage is high. "Therefore, a person will work few hours in those periods of the life cycle when the wage is low and will work many hours in those periods when the wage is high" (G.J.Borjas, 2005, Ch. 3, p.73).

Table A2, presented in the Appendix, documents the historical trends of the labour force composition in the Öresund region. First of all, it can be noticed that the labour force has been increasing over the period from 1994 to 2009 on both parts of the Öresund Region. In 2009 the labour force consisted of approximately 1 942 000 individuals, which is approximately 55 percent of the total population in the Öresund region. As illustrated in Fig. A4, the labour force participation rate in the Öresund region was relatively steady until the year 2000, from 2001 until 2008 there was a slow but relatively steady growth. That is, the proportion of the available "working age" population that is willing and able to work and is either employed or actively seeking employment, was steadily increasing throughout 2001 and 2008. In the beginning of

2010 the supply of approximately 81 percent of labour was available to be engaged in the production of goods and services; and, on average, the participation rate in the Danish part of Öresund is higher than that of the Swedish part. It is noteworthy to mention that this trend of higher labour force participation rate in the Danish part of Öresund is consistent with the theoretical prediction, since the wage rates on the Danish side of Öresund are, on average, higher compared to the Swedish side of Öresund.

It is also interesting to look at the two sides of Öresund separately. As it is known, labour force participation rates differ across assorted demographic groups in the economy, such as gender, age, ethnic group, and education.

The demographic characteristic with almost no difference in labour force participation rate is gender group. Table A3 in the Appendix describes the labour force participation rate in the Danish part of Öresund region by sex, while Table A4 describes the same but for Swedish part of the Öresund region. Here what is important to note is that Sweden and Denmark are known to be the countries with the highest female labour force participation rate among European countries. In 2009, 79 percent of the females were in the labour force in the Danish part of Öresund, while the respective percent for the Swedish part was 77 percent. The labour force participation rate of men is approximately the same on both sides of Öresund, amounting to 85 percent on the Danish side, and 83 percent on the Swedish side.

When one takes into account such demographic characteristic as age group, the difference in the labour force participation rates on both sides of Öresund, illustrated in Table 2 below, is significant:

Table 2 Labour Force Participation Rate by time, age, and region

Year	Age	16-29 years			30-49 years			50-64 years		
		090			090			090		
		Øresund Region DK+SE	Øresund Region DK	Øresund Region SE	Øresund Region DK+SE	Øresund Region DK	Øresund Region SE	Øresund Region DK+SE	Øresund Region DK	Øresund Region SE
1994		73.6	77.04	65.61	89.48	89.24	90.03	67.76	63.88	75.8
1995		74.53	80.12	61.87	88.78	88.91	88.48	70.1	66.75	77.21
1996		73.77	79.54	60.7	89.17	89.16	89.19	69.66	66.01	77.4
1997		74.84	81.98	59.55	89.23	89.63	88.37	69.36	66.08	76.23
1998		73.47	80.61	58.3	88.81	89.55	87.19	70.35	68.04	75.21
1999		73.93	81.61	58.51	88.82	89.64	87.02	70.78	68.51	75.71
2000		73.15	79.56	60.37	87.96	88.42	86.95	71.53	69.41	76.16
2001		73.07	78.35	62.3	88.26	88.63	87.48	72.22	70.06	76.8
2002		73.21	78.97	61.93	88.21	88.83	86.86	72.44	70.14	77.29
2003		72.84	78.32	61.84	88.52	89.41	86.6	73.4	71.51	77.33
2004		72.39	78.73	60.51	89.28	90.24	87.14	73.33	71.12	77.86
2005		72.76	78.32	62.31	89.49	89.59	89.26	72.22	69.92	76.99
2006		74.25	79.33	65.19	89.93	90.46	88.78	71.91	69.87	76.11
2007		74.52	79.44	65.71	90.59	90.73	90.25	71.66	69.72	75.79
2008		76.01	80.6	67.81	91.66	91.74	91.48	70.71	67.8	76.93
2009		74.19	79.52	64.65	91.53	91.77	90.97	71.65	69.06	76.99
2010		71.42	76.49	62.05	91.43	91.33	91.65	72.32	69.63	77.8

Note: for reason of comparison the age limit used is 16-64 years, as this was the former used age limit in the Swedish Labour Force Survey.

As one can see from Table 2 above, the highest participation rates, which should come as no surprise, are for those in the 30-49 year age bracket. As might be expected, people over 65 years of age have the lowest participation rates than any other age group, however, it was decided not to exhibit it in the Table. This outcome is in accordance with the economic theory of labour supply. Since a great deal of evidence suggests that the “typical worker’s age-earning profile has a predictable path: wages tend to be low when the worker is young; they raise as worker ages, peaking at about age 50, and the wage rate tends to be stable or decline slightly after age 50” (G.J.Borjas, 2005, Ch. 3, p.70). The highest participation rates in the 30-49 year age bracket can be explained by the highest opportunity cost of leisure for workers in their prime-age working years.

Considering both sides of Öresund region separately, there are interesting outcomes in the labour force participation rates. First, consider Figure 3 below:

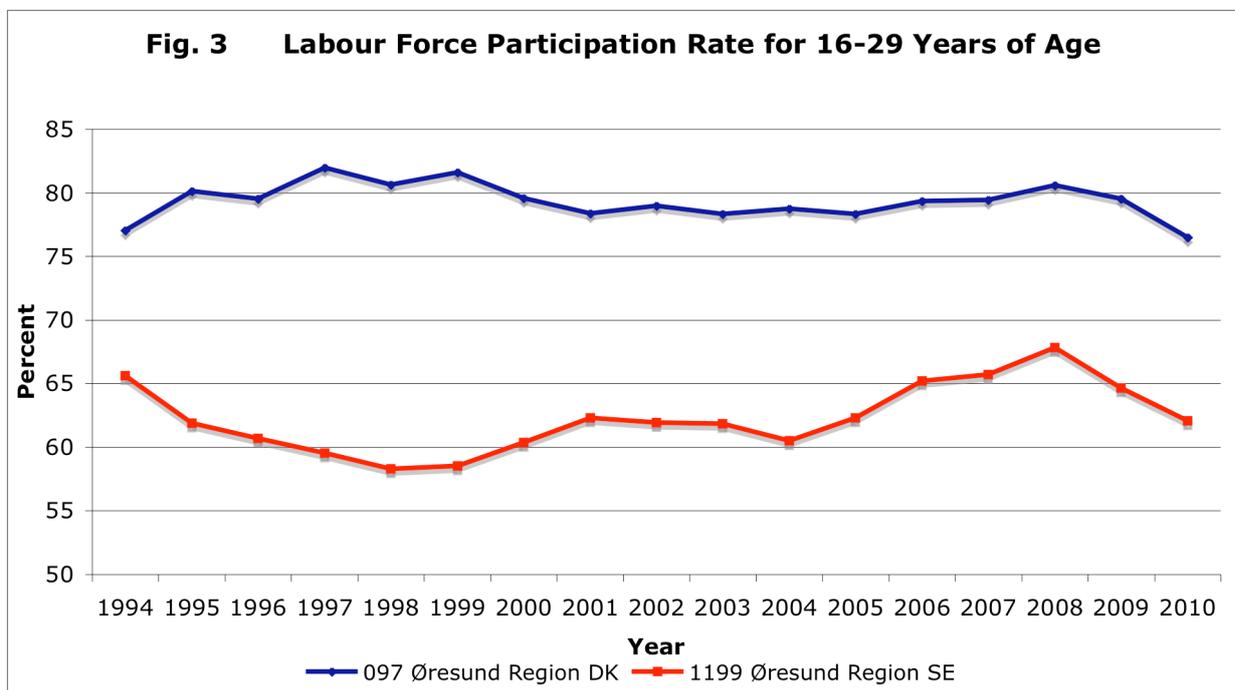
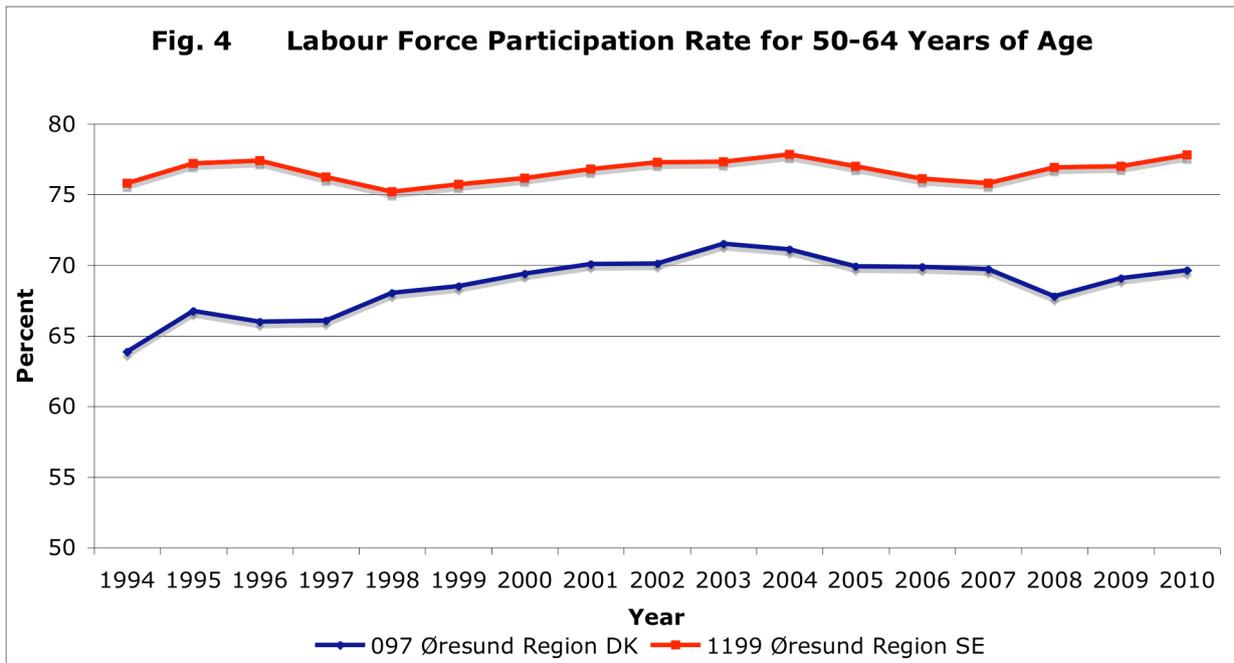


Figure 3, above, demonstrates labour force participation rate for the group in the age range of 16-29. It can be seen that on the Danish side of Öresund there is larger percentage of the population that is in the labour force compared to the Swedish side. However, when you look at age range of 50-64 there exists an opposite mirror image, depicted in Figure 4.

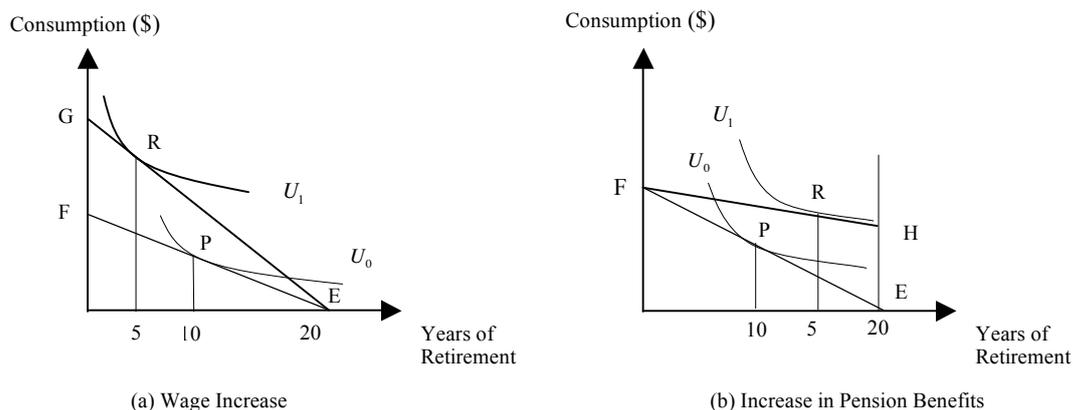


The conclusion that can be made is that the Danish part of the Öresund region has better policies in attracting younger labour force, while the Swedish part of Öresund has better policies in attracting older labour force. It can also be seen from Table 3.

According to economic theory of labour supply, one possible explanation of attracting higher number of younger labour force could be the differences in salary. It is known that the Danish side of Öresund has higher wages. With the assumption of somewhat perfect mobility, younger labour force will generally find it optimal to concentrate on work activities in those areas/places where the wage is high and to concentrate on leisure activities where the wage is low.

As noted earlier, Fig. 4 demonstrates a larger percentage of population that is in the labour force on the Swedish side compared to the Danish side when you look at the age range of 50-64.

Figure 5. The effects of an increase in the wage and pension benefits on retirement age



But what factors account for this difference in retirement decisions? Or, in other words, it is interesting to know what factors determine the optimal age of retirement? Economic theory of labour supply predicts that the worker's retirement age depends on his wage and pension benefits. Figure 5 (G.J.Borjas, 2005, Ch.3, p. 81) illustrates the effects of an increase in the wage and pension benefits on retirement age.

The provided analysis of the graphs is taken from Borjas (Ch.3, 2005). In Fig. 5(a), as wage increases, *ceteris paribus*, the worker's lifetime income increases substantially if he delays retirement. A wage increase generates both substitution and income effects. As drawn, the substitution effect dominates, thus the increase in the price of retirement outweighs the increase in the opportunity set, and the wage increase makes the individual cut the duration of his retirement from 10 to 5 years. Fig. 5(b) illustrates how an increase in pension benefits generates both income and substitution effects. But in this case, both of these effects work in the same direction. Thus, an increase in pension benefits unambiguously leads to an earlier retirement age and a longer retirement period, since the opportunity set increases, while the price of retirement decreases.

Taking into account the previous theoretical analysis, we can give possible underlying reasons for differences in the labour force participation of the older age group population. Denmark is known to have a very generous national early retirement scheme, dubbed as "efterløn", for people of 60 years or older, which pays benefits at 91% of the maximum level of unemployment benefit. The incentive structure of benefits that can be used to exit the labour market before the standard retirement age is more generous in Denmark compared to that of Sweden. Thus, in accordance with Fig. 5(b), this leads to an earlier retirement age and a longer retirement period.

These differences in the labour force participation of different demographic groups might present a possibility for gaining from integration of the Öresund Region if the governments on both sides of Öresund could learn from each other in the areas they are best at individually.

According to the Labour statistics based on Danish and Swedish administrative sources, the number of people employed in the Öresund region in 2009 amounted to nearly 1 815 167 people. From 2000 to 2009 the employment in the Öresund region has increased by 158 767 persons or by 9.5 percent despite the economic downturn during 2001 and 2003. It is worth mentioning that the economic upswing that followed from 2004 to 2007 has resulted in a sharp employment growth, high capacity utilization and a marked drop in unemployment. Thus, the number of people employed has increased by 5.1 percent in 2007. Strong demand for labour has led to greater employment opportunities for even marginalised groups among jobseekers. Important to

mention although high employment, i.e. low unemployment may sound good, but one should be aware of a combination of a labour shortage and a greying workforce that both sides of Öresund are facing today. This combination will raise the wages as companies try to hold on to their existing employees, and as a result, export competitiveness will decrease.

Looking at the employment-population ratio (Table A5 in the Appendix) one can notice that an important proportion of the population in working age is employed on both sides of Öresund. In 2009, the ratio in the Danish part was approximately 78 percent, while in the Swedish part it constituted approximately 73 percent. In general, having a high ratio will have a positive effect on the GDP per capita.

There is, however, a distinct difference between the Danish and Swedish parts of the Öresund region. As can be noticed from Table A6 in the Appendix, a larger percentage of the population aged 16-64 supports themselves via work on the labour market in Öresund DK, compared to the Swedish part of Öresund. According to my calculations, on average, 75 percent of the population is employed on the Danish side of Öresund, whilst it constitutes 70 percent for the Swedish side of the Öresund.

It can also be seen that the employment rate differs among various age groups. Much higher number of younger people is employed on the Danish side of the Öresund population, compared to the Swedish side. For instance, the employment rate for the age group of 16-29 in 2009 is 72 percent on the Danish side of the Öresund region, while it is only 53 percent in the Swedish part. Among other reasons, this is due to Denmark investing in an apprenticeship system in vocational training. However, the opposite is true for the 50-64 age group, where it is more active on the labour market in Öresund SE than in Danish Öresund. The reason for that can be the Danish “*efterløn system*”, discussed above, which allows employees who have turned 60 to withdraw from the labour market, on one hand; and the Swedish policy that has been successful when it comes to attracting a large share of the population’s older age group.

5. Human Capital Investments – Differences and Determinants

In general terms, investment people make in themselves that enhance their economic productivity represents human capital (Olaniyan, D.A., Okemakinde, T. (2008)). The theoretical framework that emphasizes how education increases productivity and efficiency of workers is known as human capital theory.

Educational attainment is a commonly used proxy for the stock of “human capital.” Thus, provision of formal education is seen as an investment in human capital. The question that arises here is that of how much of the resources should be allocated on education? Human capital theory suggests that an individual should invest in education until the point where the present value of the benefits of further investment no longer exceeds the marginal costs.

It is difficult to compare the level of education in different countries due to different educational systems and no perfect means of comparable statistical measurements. OECD measures it by the number of years of education. According to the OECD, both Sweden and Denmark are above average regarding the level of education in the general population. However, when comparing what share of the population that has a university or higher education the results are not as impressive. Sweden comes in fifteenth place, whereas Denmark comes in ninth place in 2008, as it is evidenced by the average from Figures A5 and A6.

Regarding the Öresund region as a whole, almost 29% of the population between the ages 20 and 74 in the Öresund region has a higher education, defined as at least 2 years of post-upper secondary education. This is reflected in the Figure TABLE 3 of the Appendix. There are great differences regarding the education level of the population within the Öresund Region. According to Tendens Øresund, the Capital Region of Denmark has the highest percentage of persons with a university education, followed by Region Skåne. Between 2000 and 2007 the share of persons in age 25-74 with university and higher education (ISCED 5+6) has increased in the Öresund Region. For example, on the Swedish side of the Öresund it constitutes an increase from 24.5% in 2000 to 31.5% percent in 2007. While on the Danish side of the Öresund there is an increase of 6.6 percentage points from 25.6 percent in 2000 to 32.2 percent in 2007.

The large internal differences are also reflected on the municipal level, which is in accordance with Tendens Øresund. In some municipalities, more than 40 percent of the population (aged 25-64) has a higher education. This applies to e.g. Lomma and Lund. But this tendency for persons with higher education to concentrate in certain areas is a well-known phenomenon of many major urban areas, where various institutions of higher learning as well as knowledge-intensive companies are localised.

It is also important to highlight the significant differences in educational level of the youth (aged 15-29) on the Danish and Swedish sides of the Öresund Region. Whereas the overall percentage of the population (aged 15-29) with a university and higher education in Sweden is 14.9 percent and 11 percent in Denmark in 2007 (See Table 3 and 4 below), the overall participation in higher education has increased since the Bridge between the two countries has opened.

Table 3. Percentage of population aged 15-29, composition by educational level in Sweden

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Compulsory school (ISCED 1+2)	31.30	35.50	33.80	34.00	34.80	35.40	36.20	37.00	37.30	37.20
Upper & post secondary (ISCED 3+4)	58.40	54.70	49.40	48.50	47.40	46.20	45.10	44.40	43.80	44.10
University & higher education (ISCED 5+6)	7.20	7.00	13.90	14.50	15.00	15.20	15.30	15.30	14.90	14.90
No information	3.00	2.90	2.80	3.00	2.80	3.20	3.30	3.30	3.90	3.70
Total number	1,531,415	1,620,222	1,617,460	1,615,614	1,617,978	1,629,268	1,642,728	1,669,709	1,709,033	1,749,006

Note: the year 2007 was chosen because it is the last year with available data.

Table 4. Percentage of population aged 15-29, composition by educational level in Denmark

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Compulsory school (ISCED 1+2)	45.0	44.5	44.2	44.4	45.0	45.5	46.3	47.4	49.1	49.5
Upper & post secondary (ISCED 3+4)	44.2	43.3	42.2	42.1	40.2	38.8	37.5	36.3	35.1	34.4
University & higher education (ISCED 5+6)	8.2	8.4	9.4	9.8	10.1	10.7	10.9	10.9	10.9	11.0
No information	2.6	3.7	4.2	3.7	4.7	5.0	5.3	5.3	4.8	5.1
Total number	1,020,280	1,004,521	990,303	975,755	960,451	950,522	942,837	937,562	942,897	957,783

The Swedish youth on average has a higher level of education – and this is the case for employed youth as well as for unemployed youth. Approximately 15 percent of the youth in Öresund SE had attained a university and higher education level in 2007; whereas only 11 percent of the population aged 15-29 had attained a university and higher education in 2007 on the Danish side of the Öresund region, according to the Tables 3 and 4. Therefore, theoretically, the Swedish youth should have a potential for a relatively higher productivity in the labour market of both sides of the Öresund region, according to the theoretical framework of human capital. It also means that there is an unused labour supply on the Swedish side in the form of an unemployment reserve with relatively high formal human capital level. In 2005, there were 1,356 persons aged 16-29 with higher education, who were unemployed on the Swedish side of the Öresund, but this number fell to 624 persons who were unemployed in 2007 (Table A7 of the Appendix). If this unemployment with relatively higher formal human capital on the Swedish side is efficiently utilised, then it can give a positive contribution to the whole development of the Region.

On one hand, the formal level of education is higher amongst youth in Sweden; on the other hand, Denmark is known to provide possibilities for the youth to learn and get relevant abilities through other means rather than just formal schooling. Educational and vocational guidance is given high priority in Denmark. According to the Danish Ministry of Education, I-VET, the Danish vocational education and training programmes, are alternating or sandwich-type programs, where practical training in a company alternates with teaching at a vocational college. The objective of vocational education and training programmes is to motivate young people to complete a programme of training that can qualify them for employment and at the same time, accommodate the needs of the labour market. The programmes aim to give the young people a taste of further education and active participation in society by developing the students' personal and social skills like instilling a spirit of independence and cooperation, and stimulating their

awareness about innovation, environment and internationalization, according to the Danish Ministry of Education. Thus, 57 percent of a youth cohort is admitted to a VET. A declining share of these comes directly from compulsory education in “Folkeskolen” (primary and lower secondary education) while a number of participants are admitted after having been in the labour market. “Approximately, 38 percent of youth cohorts obtain a vocational education,” according to the Danish Ministry of Education. Thus, compared to Sweden there is a better-developed system for traineeship jobs and other similar skilled types of jobs. This, in turn, could be a reason why the unemployment rates are lower for the highly educated Danish youth compared to the corresponding Swedish youth.

On both sides of the Bridge, the quality of education is the key factor for the future success of the Region. That is why it is important for both sides of the Region to learn from each other in this area.

6. Potential Gains from Integration

This Section is a concluding section that summarizes the analysis of the potential gains from integration.

The opening of the Öresund Bridge, which connects the city of Copenhagen and Malmö, brought new opportunities for trade and communication and has positioned the area as the regional hub in the Baltic Sea. With the opening of the new project – the City Tunnel – many economists, and politicians expect the path of integration to increase.

There are 3 sources of potential gain:

1. The integration of the two labour markets
2. Gains from a decrease in unemployment
3. Learning from the “better practice”

Now we refer to each of the sources of potential gains, separately.

1. A fixed link across the maritime border increased the hopes of magnitude of cross-border regional enlargement processes. It also constitutes a symbol of cross-border integration.

A cross-border integration of pairs of border cities has been analyzed in a number of articles, see e.g. Ehlers et al. (2001). A binational city requires social ties and a common identity. Ehlers (2001) suggested four operational indicators in a stepwise procedure. The four steps are: (1) use of physical facilities, (2) social interaction, (3) being identified with common norms, values, and goals, (4) identification with a place in terms of cognitive representation and emotional evaluation. To evaluate the integration process of the Öresund Region, it has been decided here to look at the first two steps, due to the lack of data to identify steps number three and four. So, the first step concerns the physical facilities of interaction, which has over the years been possible through several ferry connections along the coastline of Öresund, as well as through a fixed link that provided stable transport connections since 2000. According to Matthiessen (2004), the link has changed the geography of the Öresund Region making a wider area accessible for a larger population base.

According to the Öresund Committee, the Öresund Region is an important hub for economic activity in Scandinavia. According to Table 5 (See the Appendix), in 2008, some 19,800 persons commuted daily between home and work across the Öresund. Commuting across Öresund has increased six-fold since the opening of the Öresund Bridge in 2000. As can be seen from Table

5, the increase in the number of commuters has been exceptionally large during both 2006 and 2007.

Table 5. Number of commuters from Öresund SE to Öresund DK, Composition by Birth country

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Denmark	839	888	882	1110	1529	2142	2769	3433	4138	5647	6992	6891
Sweden	1110	1243	1438	1594	1826	2010	2167	2599	3226	4581	7063	7814
Europe, other EU-25 countries	74	96	111	125	156	195	203	247	300	467	705	846
The rest of Europe	52	59	70	76	95	138	231	354	458	796	1170	1300
Outside Europe	54	77	78	100	139	205	303	513	645	1233	1926	2235
Not known	1	2	5	5	6	7	10	14	16	20	34	11
Total number of commuters from Öresund SE to Öresund DK	2130	2365	2584	3010	3751	4697	5683	7160	8783	12744	17890	19097
Denmark (in %)	39	38	34	37	41	46	49	48	47	44	39	36
Sweden (in %)	52	53	56	53	49	43	38	36	37	36	39	41
Europe, other EU-25 countries (in%)	3	4	4	4	4	4	4	3	3	4	4	4
The rest of Europe (in%)	2	2	3	3	3	3	4	5	5	6	7	7
Outside Europe (in%)	3	3	3	3	4	4	5	7	7	10	11	12
Not known (in%)	0	0	0	0	0	0	0	0	0	0	0	0

These years were characterized by a shortage of manpower in Danish companies. In addition, the differences in housing prices on the Danish and Swedish sides of Öresund played one of the crucial roles in such an increase of the number of commuters. The rapid increase in cross-border commuting from Sweden appears to be driven not only by cheap housing prices, but also by lower automobile taxes in southern Sweden, as well as higher wages in Copenhagen.

Analyzing the demographic characteristics of the commuters leads to interesting observations. Regarding the commuters themselves, 96.4 percent of commuters live in Sweden and work in Denmark in 2008¹. As shown in Table 5 and A9, in 2008 there were 19,097 persons commuting from Öresund SE to Öresund DK, while there were only 708 commuters from Öresund DK to Öresund SE. Despite the majority of Öresund commuters living in Skåne, most of these commuters were born in Denmark. In fact, the Danes now represent the largest immigrant group in Malmö – 9,000 individuals. Thus, 36 percent of the commuters from Öresund SE to Öresund DK had Danish background, and 41 percent had Swedish background in 2008 (Table 5). However, the trend is towards a declining share of the commuters having a Swedish background. Thus, 53 percent of the commuters from Öresund SE had a Swedish background in 2000. With the opening of the Bridge, this percentage gradually declined, resulting in 41 percent of the commuters with a Swedish background. The same development can be found for the commuting from Öresund DK to Öresund SE: a smaller and smaller share of commuters with Swedish background; whereas the share of commuters, born outside Europe, is gradually increasing. These results are very interesting; because this means that the opening of the Bridge resulted in the change of the structure of the commuters, in other words, it resulted in a change in the commuting patterns. That is, the increase of the commuters with Danish background is much

¹ Remark: the data for 2009, and 2010 is not available yet.

higher than that of Swedish background. In addition to this, the share of commuters born outside Europe has increased from 2.6 percent in 1997 to 12 percent in 2008.

What is the reason for this outcome? Does this mean that the Danish part of the Öresund is integrating more than the Swedish part? Or is it simply because of the strong incentives to move to Skåne? The fact that there is an increasing number of commuters in the Öresund region who were born outside of Europe might imply that the Öresund Region is becoming more and more international.

It should be mentioned that there were, indeed, strong economic incentives for Danes to move to Skåne during the entire period since the opening of the Öresund Bridge. Amongst others, they are the lower costs of living, and lower real estate prices and a lower tax on cars. Apart from economic reasons for Danes moving to Skåne there is also a political reason. Specifically, the 24-year old rule, a part of Denmark's recently revamped rules on family reunification that went into effect on the 1st of July 2002. This rule applies to marriages where one or both parties are non-Danish citizens, and include housing and income conditions, the stipulation that a couple has a greater affiliation to Denmark than to any other country, and the requirement that both parties be over 24-years of age.

There is growing number of Swedes, even though growing slower than that of Danes, who are commuting in order to take advantage of the need for labour on the job market in Copenhagen and the higher salaries offered in Denmark. During 2006, due to shortages of manpower in Denmark, Danish companies began recruiting Swedish labour at an increasing rate.

Shortly, the integration of the two labour markets leads to an increased potential of gain through a number of channels. Increased labour mobility that results from the regional integration implies that employers can seek the most skilled labour within the region to accomplish the tasks of the company, thus employer gets the best possible product or service for its market. At the same time, labour gets the best possible wage. The resulting efficiency in the market may lead to higher long-run growth rate. These circumstances point to the positive sum game from the regional integration.

As previously mentioned the regional integration means access to a wider knowledge base compared to prior to formation of the Öresund region. The size of an aggregate knowledge base affects the rate at which the new knowledge is generated, which in turn leads to a higher long-run growth.

2. Looking at the educational attainment, it could be noted that the Swedish youth on average has a higher level of education – it is true for both employed youth as well as for unemployed youth. Therefore, theoretically, the Swedish youth should have a potential for a relatively higher productivity in the labour market of both sides of the Öresund region, according to the theoretical framework of human capital. It also means that there is an unused labour supply on the Swedish side in the form of an unemployment reserve with relatively high formal human capital level. If this unemployment with relatively higher formal human capital on the Swedish side is efficiently utilized, then it can give a positive contribution to the whole development of the Region.

3. As was mentioned in Section 4, the labour force participation is very different when one looks at the age group characteristic. The Danish part of the Öresund region has better policies in attracting younger labour force, while the Swedish part of Öresund has better policies in attracting older labour force (Table 2). If governments on both sides of Öresund will be capable of internalizing these differences, and learn from each other in the areas they are best at individually, then I can see great potential gains from integration here.

In order to be able to utilize this potential the suggested recommendation for the Danish side of the Öresund would be to abolish the voluntary early retirement pension, since it is clearly the main barrier, in theory and in practice, of increasing the participation rates of older workers. In fact, a recent study for Denmark has shown that the potential gains of increasing the labour force supply of the elderly are greater than those of increasing the supply in other ages (Arbejdsmarkedskommissionen 2009). This result might be explained by the fact that good pension benefits generate both income and substitution effects that work in the same direction: it leads to an earlier retirement age and a longer retirement period.

The conclusion that can be made is that the Danish part of the Öresund region has better policies in attracting younger labour force, while the Swedish part of Öresund has better policies in attracting older labour force. It can also be seen from Table 2.

Another aspect of learning from the “better practice” concerns the educational attainment. The Swedish youth on average has a higher level of education – it is true for both employed youth as well as for unemployed youth. Therefore, theoretically, the Swedish youth should have a potential for a relatively higher productivity in the labour market of both sides of the Öresund region, according to the theoretical framework of human capital. It also means that the Swedish government has better policies of investment in human capital. Thus, there is a possibility of learning from the “better practice”. In other words, the Danish Government needs to analyze the

Swedish educational policy and change its' policies so that higher amount of students will attain higher education, thus, increasing the productivity of its youth.

On one hand, the formal level of education is higher amongst youth in Sweden; on the other hand, Denmark provides better possibilities for the youth to learn and get relevant abilities through other means rather than just formal schooling. Compared to Sweden there is a better-developed system for traineeship jobs and other similar skilled types of jobs, which, in its turn, results in a larger rate of younger labour force participation. Thus, there is a possibility of learning from the "better practice". Sweden could analyze the differences in the vocational education and training programs from the Danish neighbours, in particular analyzing the Danish I-VET programme, which is quite successful in accomplishing its' goals, described in Section 5. Another aspect of learning is that of better policies in attracting younger labour force on the Danish side of Öresund.

With the demographic prospects discussed above it is important to note that while there are developments that would help to offset the negative effects of population ageing and the consequent effects of a decline in growth, they need to go together with attempts to mobilize all the available labour reserves in order to sustain economic growth.

List of Reference

- Aghion, P., Howitt, P. (1999). *Endogenous Growth Theory* (3rd ed.). The MIT Press.
- Arbejdsmarkedskommissionen (2009). *Velfærd kræver arbejde*. Albertslund: Schultz.
- Becker, G.S. (1981). *A Treatise on the Family*. Cambridge, MA: Harvard University Press.
- Becker, G.S. (1985). *An Economic Analysis of the Family*. Dublin: Economic and Social Research Institute.
- Benhabib, J and Spiegel, M. (1994). The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data. *Journal of Monetary Economics*, 34, 143-174.
- Bils, M. and Klenow, P. (2000). Does Schooling Cause Growth? *American Economic Review*, 90, 1160-1183.
- Blomquist, N.S. and U. Hansson-Brusewitz (1990). The Effect of taxes on Female and Male Supply in Sweden. *Journal of Human Resources*, 25(3), 317-348.
- Blundell, R. and T. MaCurdy, (1999). Labour Supply: a review of alternative approaches. In O. Ashenfelter & D. Card (eds.), *Handbook of Labour Economics* (vol. 3, pp. 1559-1695). North Holland: Amsterdam,
- Borjas G.J. (2005). *Labor Economics* (3rd ed.). McGraw-Hill/Irwin.
- Bucken-Knapp, G. (2001). Just a train-ride away, but still worlds apart: Prospects for the Øresund region as a binational city. *GeoJournal*, 54, 51-60
- Hansen, T., Hansen, R.F. (2006). Integration of the scientific community as exemplified by the biotech sector: An analysis based on the bibliometric indicators in the Danish-Swedish border region. *GeoJournal*, 67, 241-252.
- Lucas, R. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22, 3-42.
- Mankiw, G., Romer, D., and Weil, D. (1992). A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics*, 107, 407-438.
- Matthiessen, C.W. (1999). Potential integration of Copenhagen and Malmø-Lund: A cross border project on the European metropolitan level. In C. Iversen, & B. Mogensen (eds), *Proceedings Øresund link conference* (pp.1-10). Copenhagen: Øresundskonsortiet.
- Matthiessen, C.W. (2004). The Øresund area: Pre- and post- bridge cross-border functional

integration: the bi-national regional question. *GeoJournal*, 61, 31-39.

Matthiessen, C.M. (2000). Bridging the Öresund: potential regional dynamics: Integration of Copenhagen (Denmark) and Malmö-Lund (Sweden). *Journal of Transport Geography*, 8, 171-180.

Matthiessen, C.W., Schwarz, A.W. (1999). Scientific centres in Europe: an analysis of research strength and patterns of specialization based on bibliometric indicators. *Urban Studies* 36 (3), 453-477.

Nelson, R. and Phelps, E. (1966). Investment in Humans, Technological Diffusions and Economic Growth. *American Economic Review*, 56, 69-75.

Olaniyan, D.A. and Okemakinde, T. (2008). Human Capital Theory: Implications for Educational Development. *European Journal of Scientific Research*, 24 (2), pp.157-162.

Scherer, F. and Hue, K. (1992). Top Managers' Education and R&D Investment. *Research Policy*, 21, 507-511.

Weil, D.N. (2005). *Economic Growth* (1st ed.).

Yasuoka, M., Miyake, A. (2010). Change in the Transition of the Fertility Rate. *Economic Letters*, 106, 78-80

Örestat (2006). Öresund data bank. Retrieved from <http://www.dst.dk/extranet/oresund1/>. Cited 20 May 2009.

The limits of a Green Revolution? BBC News. Retrieved from: http://news.bbc.co.uk/2/hi/in_depth/6496585.stm on 2010-08-01

(2008). Where bosses will be your friends. *Economist*, 387(8574), 56. Retrieved from Humanities International Complete database.

<http://www.oresundskomiteen.dk/About--resundskomiteen/News>

<http://www.oresundskomiteen.dk/About--resundskomiteen/Background>

http://www.oecd.org/country/0,3377,en_33873108_33873822_1_1_1_1_1,00.html

http://www.oecd.org/document/41/0,3343,en_2649_33733_34355945_1_1_1_1,00.html

<http://www.oresundregion.org/41f70029>

<http://www.kk.dk/~media/5A21F3E8D118425A87139AF0B7230038.ashx>

<http://www.oecd.org/dataoecd/38/48/35706830.pdf>

<http://www.un.org/esa/population/publications/worldageing19502050/pdf/81chapteriii.pdf>
(Retrieved as of March 2010)

Eurostat. The Statistical Office of the European Community, Luxembourg.
<http://ec.europa.eu/eurostat>.

Eurostat's latest population projection scenario (EUROPOP 2008, convergence scenario).

All the data are taken from Ørestat databank, unless otherwise stated.

Table A1. Population 31 Dec by municipality and year

Number of persons	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
101 København	487969	491082	495699	499148	500531	501285	501664	502362	501158	503699	509861	518574
217 Helsingør	58645	59092	59492	60131	60546	60569	60927	61295	61340	61012	60844	61053
1280 Malmö	251408	254904	257574	259579	262397	265481	267171	269142	271271	276244	280801	286535
1283 Helsingborg	115418	116337	116870	117737	118512	119406	120154	121179	122062	123389	124986	126754
Population of the Danish part of Øresund region	2370907	2383150	2394765	2407257	2417884	2425036	2430605	2437491	2444984	2452772	2465156	2483441
Population of the Swedish part of Øresund region	1116603	1120426	1123786	1129424	1136571	1145090	1152697	1160919	1169464	1184500	1199357	1214758
The Øresund Region (S+DK)	3487510	3503576	3518551	3536681	3554455	3570126	3583302	3598410	3614448	3637272	3664513	3698199
As a percentage of the total Øresund Region	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
101 København	13.99	14.02	14.09	14.11	14.08	14.04	14	13.96	13.87	13.85	13.91	14.02
217 Helsingør	1.68	1.69	1.69	1.7	1.7	1.7	1.7	1.7	1.7	1.68	1.66	1.65
1280 Malmö	7.21	7.28	7.32	7.34	7.38	7.44	7.46	7.48	7.51	7.59	7.66	7.75
1283 Helsingborg	3.31	3.32	3.32	3.33	3.33	3.34	3.35	3.37	3.38	3.39	3.41	3.43
Population of the Danish part of Øresund region	67.98	68.02	68.06	68.07	68.02	67.93	67.83	67.74	67.64	67.43	67.27	67.15
Population of the Swedish part of Øresund region	32.02	31.98	31.94	31.93	31.98	32.07	32.17	32.26	32.36	32.57	32.73	32.85
The Øresund Region (S+DK)	100	100	100	100	100	100	100	100	100	100	100	100

Fig. A3 Population of the Øresund Region (S+DK)

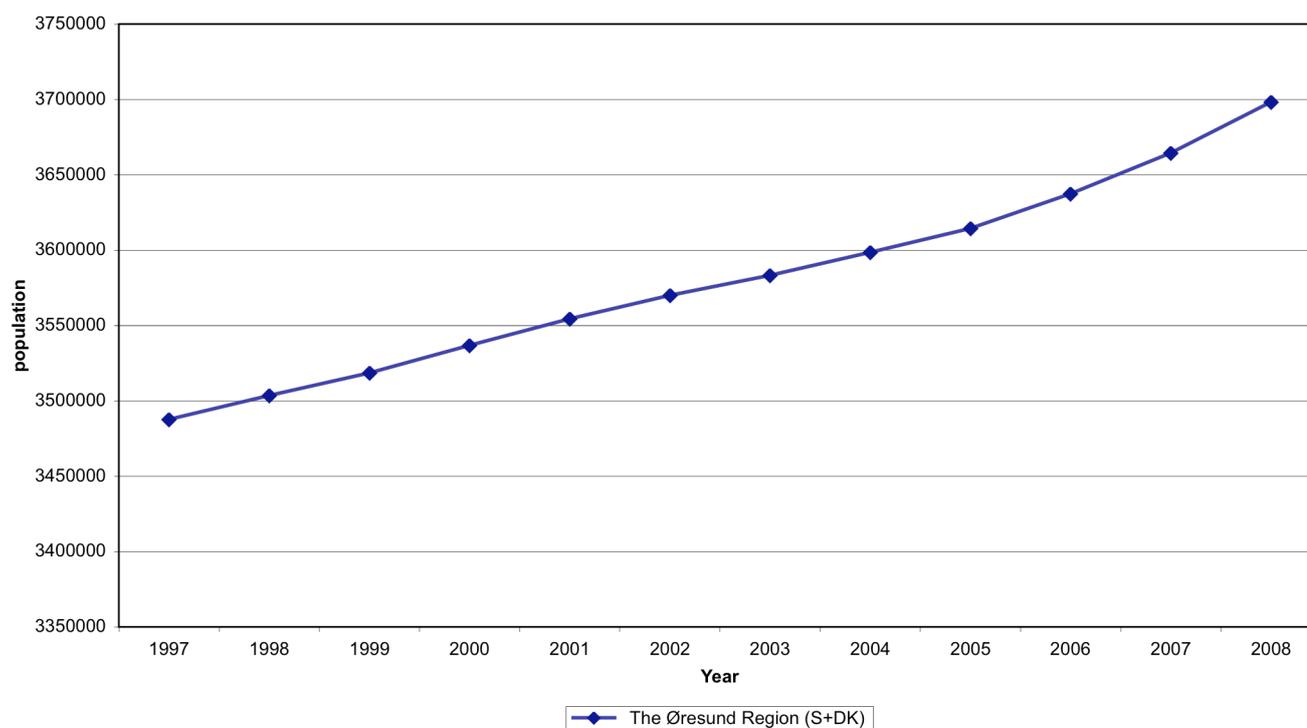


Table A2. Labour Force Composition, Öresund Region
(Number of persons (1000) by time, labour force participation, and region)

Year	Labour Force			Total population			Labour Force Participation in the Öresund Region		
	090 Øresund Region DK+SE	097 Øresund Region DK	1199 Øresund Region SE	090 Øresund Region DK+SE	097 Øresund Region DK	1199 Øresund Region SE	Total Öresund	Öresund DK	Öresund SE
1994	1722.53	1190.77	531.8	2174.37	1501.07	673.27	79.22	79.33	78.99
1995	1730.35	1207.42	522.88	2169.57	1496.03	673.58	79.76	80.71	77.63
1996	1733.95	1210.53	523.48	2178.78	1505.12	673.63	79.58	80.43	77.71
1997	1745.10	1210.85	534.25	2190.88	1494.17	696.70	79.65	81.04	76.68
1998	1745.40	1216.58	528.83	2200.12	1500.72	699.43	79.33	81.07	75.61
1999	1757.90	1224.85	533.05	2209.43	1505.15	704.25	79.56	81.38	75.69
2000	1749.08	1208.7	540.4	2209.32	1501.92	707.45	79.17	80.48	76.39
2001	1775.30	1222.12	553.2	2233.47	1518.78	714.70	79.49	80.47	77.40
2002	1778.75	1221.45	557.27	2236.25	1513.72	722.55	79.54	80.69	77.13
2003	1810.88	1248.12	562.75	2266.70	1536.28	730.43	79.89	81.24	77.04
2004	1807.55	1241.38	566.15	2255.60	1520.17	735.45	80.14	81.66	76.98
2005	1809.72	1232.25	577.42	2263.10	1523.83	739.25	79.97	80.87	78.11
2006	1823.75	1234.55	589.17	2268.00	1516.17	751.83	80.41	81.43	78.37
2007	1910.33	1305.88	604.42	2364.82	1599.38	765.45	80.78	81.65	78.96
2008	1938.00	1315.58	622.42	2382.07	1607.67	774.35	81.36	81.83	80.38
2009	1941.80	1320.2	621.58	2394.25	1609.75	784.50	81.10	82.01	79.23
2010 Q1	1930.70	1307.1	623.6	2396.80	1609.60	787.20	80.55	81.21	79.22

Note: The Labour Force Participation Rate is found by dividing the labour force by the total population

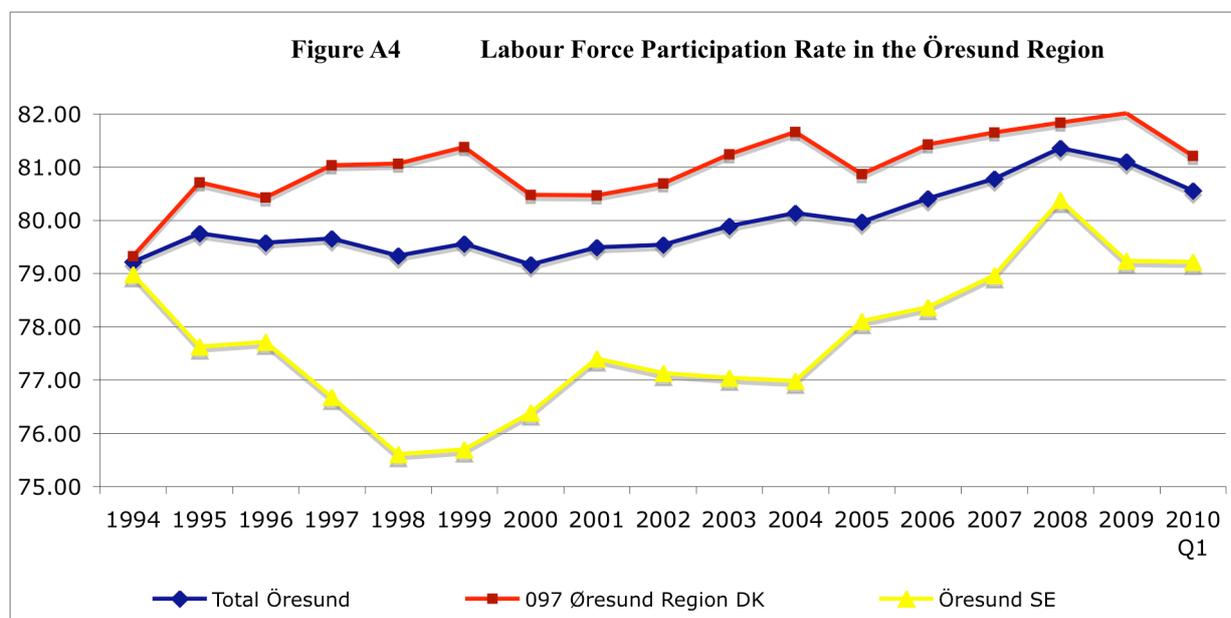


Table A3. Labour Force Participation Rate of Öresund Region DK, by sex

Year	Labour Force Participation rate	
	Male	Female
1994	0.84	0.74
1995	0.86	0.76
1996	0.86	0.75
1997	0.86	0.76
1998	0.85	0.77
1999	0.86	0.77
2000	0.84	0.77
2001	0.84	0.77
2002	0.84	0.77
2003	0.85	0.78
2004	0.85	0.78
2005	0.84	0.78
2006	0.85	0.78
2007	0.85	0.78
2008	0.85	0.78
2009	0.85	0.79

Table A4. Labour Force Participation Rate of Öresund Region SE, by sex

Year	Labour Force Participation rate	
	Male	Female
1994	0.81	0.77
1995	0.79	0.76
1996	0.80	0.76
1997	0.79	0.75
1998	0.78	0.73
1999	0.79	0.73
2000	0.79	0.73
2001	0.80	0.74
2002	0.80	0.74
2003	0.80	0.74
2004	0.79	0.75
2005	0.81	0.75
2006	0.81	0.76
2007	0.81	0.77
2008	0.83	0.78
2009	0.82	0.77

Note: The Labour Force Participation Rate of male or female is found by dividing the labour force of male or female by the total male or female population, respectively.

Table A5. Employment-to-Population Rate in the Öresund Region (number of persons (1000) by region)

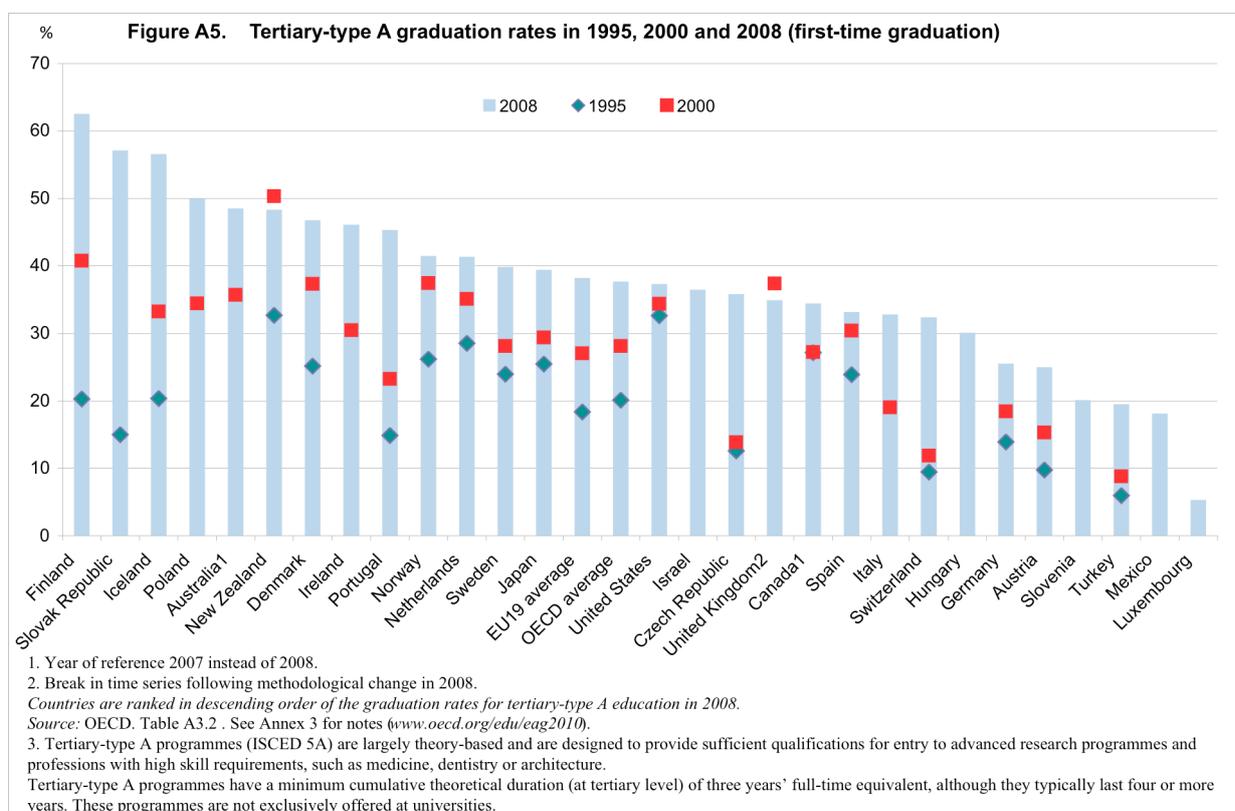
Year	090 Øresund Region DK+SE		097 Øresund Region DK		1199 Øresund Region SE	
	Total	Employment Population Ratio	Total	Employment Population Ratio	Total	Employment Population Ratio
1994	1572.933	72.34	1094.800	72.93	478.067	71.01
1995	1589.450	73.26	1120.225	74.88	469.225	69.66
1996	1592.650	73.10	1129.075	75.02	463.600	68.82
1997	1606.975	73.35	1136.650	76.07	470.400	67.52
1998	1627.675	73.98	1152.600	76.80	475.025	67.92
1999	1648.450	74.61	1161.575	77.17	486.875	69.13
2000	1656.400	74.97	1155.900	76.96	500.550	70.75
2001	1683.000	75.35	1166.250	76.79	516.725	72.30
2002	1686.500	75.42	1165.200	76.98	521.350	72.15
2003	1704.150	75.18	1180.975	76.87	523.125	71.62
2004	1700.650	75.40	1178.250	77.51	522.450	71.04
2005	1702.125	75.21	1174.100	77.05	528.025	71.43
2006	1728.125	76.20	1187.500	78.32	540.700	71.92
2007	1815.700	76.78	1253.550	78.38	562.100	73.43
2008	1848.350	77.60	1271.600	79.10	576.725	74.48
2009	1815.167	75.91	1246.533	77.50	568.600	72.65

Note: According to the World Bank (<http://data.worldbank.org/indicator/SL.EMP.TOTL.SP.ZS> as of 11.08.2010), employment-to-population ratio is the proportion of a country's population that is employed.

Table A6. Employment-to-Population Rate by time, age and region

Year	16-29 years			30-49 years			50-64 years		
	Øresund Region								
	DK+SE	DK	Region SE	DK+SE	DK	Region SE	DK+SE	DK	Region SE
1994	64.93	69.40	54.67	82.80	83.07	82.27	62.67	58.77	70.83
1995	66.05	72.48	51.68	82.80	83.70	80.70	65.05	62.03	71.50
1996	65.78	72.73	50.03	82.60	83.75	80.08	65.03	62.28	70.88
1997	67.13	75.70	48.85	82.83	84.68	78.75	64.78	62.55	69.43
1998	67.13	75.48	49.45	83.35	85.33	79.05	66.10	64.55	69.35
1999	67.48	75.80	50.68	84.18	85.85	80.48	66.80	65.18	70.43
2000	68.00	75.28	53.55	83.90	85.00	81.55	68.03	66.45	71.33
2001	67.28	73.03	55.65	84.40	85.20	82.63	69.15	67.45	72.75
2002	67.80	74.18	55.38	84.20	85.15	82.23	69.25	67.33	73.35
2003	66.35	72.23	54.45	84.18	85.33	81.65	69.78	68.23	73.00
2004	66.00	73.55	51.80	84.93	86.28	81.95	69.48	67.55	73.38
2005	65.60	73.15	51.48	85.08	85.95	83.30	69.00	66.98	73.20
2006	66.83	74.13	53.80	86.65	88.05	83.70	69.08	67.48	72.33
2007	67.65	74.33	55.70	87.43	87.93	86.35	68.88	67.30	72.38
2008	69.68	76.43	57.55	88.53	89.18	87.03	68.30	65.95	73.23
2009	65.15	72.00	52.90	86.90	87.50	85.63	68.23	65.95	72.93
2010 (Q1,Q2)	61.65	67.25	51.40	86.25	86.05	86.55	68.65	66.35	73.60

Note: For reason of comparison the ge limit used in the database is 16-64 years, as this was the former used age limit in the Swedish Labour Force Survey.



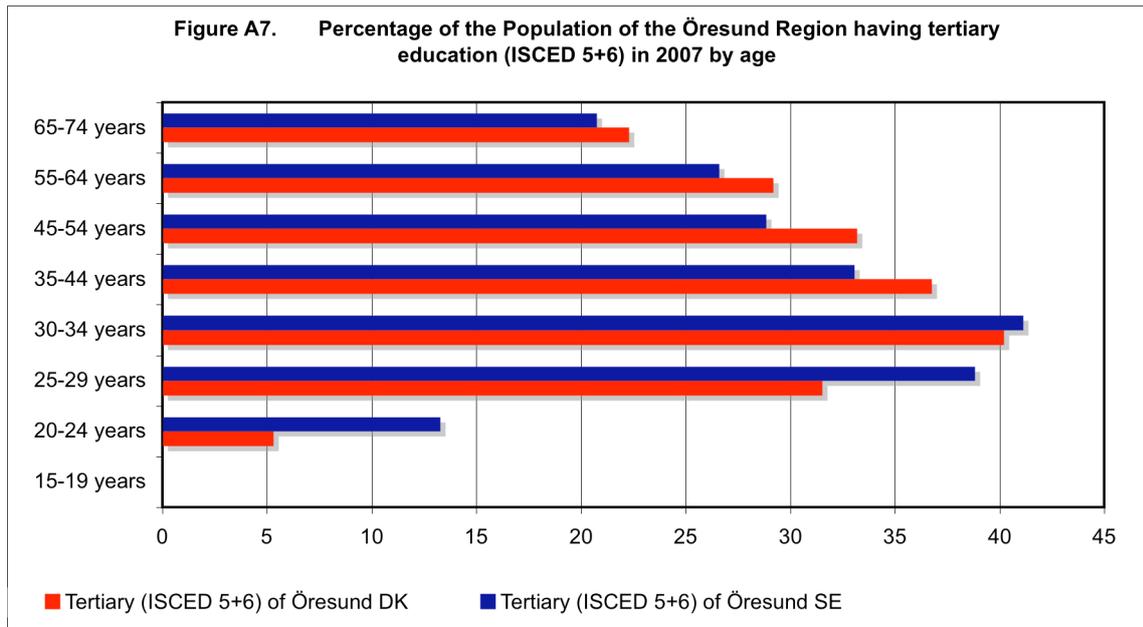
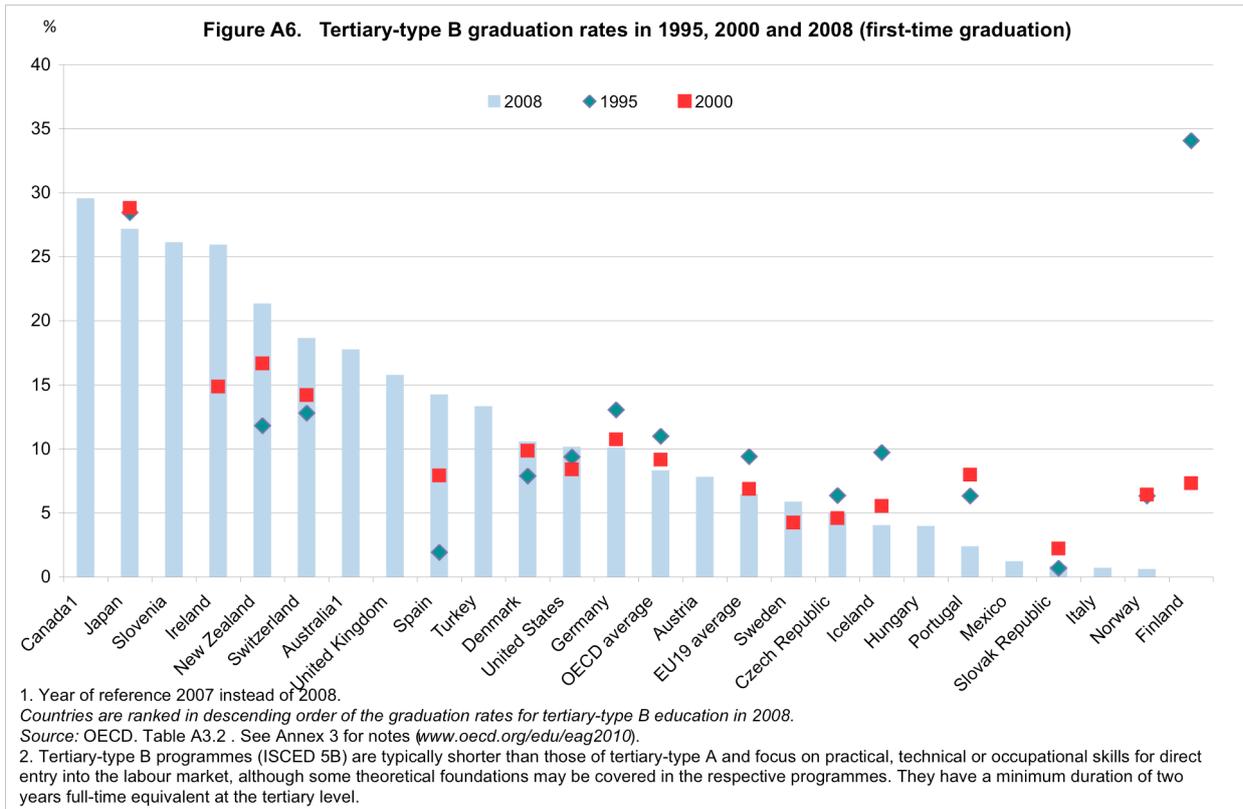


Table A7. Number of unemployed persons with Tertiary education, aged 16-29

	2001	2002	2003	2004	2005	2006	2007
Öresund DK	1575	2184	2447	2035	1530	1174	1039
Öresund SE	856	1038	1483	1503	1356	840	624

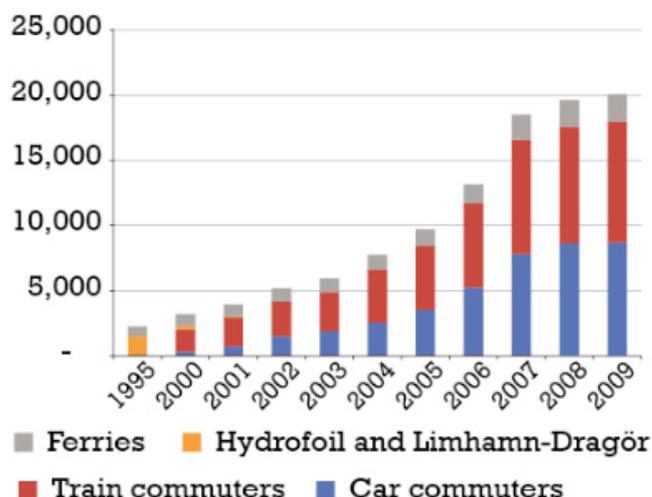
Table A8. Commuters of the Öresund Region, composition by place of residence

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
From Öresund SE to Öresund DK	2130	2365	2584	3010	3751	4697	5683	7160	8783	12744	17890	19097
From Öresund DK to Öresund SE	166	188	204	281	539	533	536	692	734	750	623	708
Total	2296	2553	2788	3291	4290	5230	6219	7852	9517	13494	18513	19805

Table A9 Number of commuters from Öresund DK to Öresund SE by Birth country

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Denmark	45	50	47	98	293	277	294	378	407	364	391	469
Sweden	102	119	131	159	178	177	162	205	219	223	150	149
Europe, other EU-25 countries	4	4	9	14	27	32	30	45	41	36	42	44
The rest of Europe	6	4	5	7	20	17	19	23	22	24	17	13
Outside Europe	5	5	7	1	15	24	24	34	37	34	23	33
Not known	4	6	5	2	6	6	7	7	8	69	0	0
Total number of commuters from Öresund SE to Öresund DK	166	188	204	281	539	533	536	692	734	750	623	708
Denmark (in %)	27	27	23	35	54	52	55	55	55	49	63	66
Sweden (in %)	61	63	64	57	33	33	30	30	30	30	24	21
Europe, other EU-25 countries (in %)	2	2	4	5	5	6	6	7	6	5	7	6
The rest of Europe (in %)	4	2	2	2	4	3	4	3	3	3	3	2
Outside Europe (in %)	3	3	3	0	3	5	4	5	5	5	4	5
Not known (in %)	2	3	2	1	1	1	1	1	1	9	0	0

Figure A8. Number of commuters across Öresund



Note: the figure is taken from www.tendensoresund.org