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Master Programme in Economic Growth,
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The Oresund Bridge and the commuting trends.

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Abstract: Ten years ago a giant infrastructure named Oresund Bridge has been created connecting two regions, Scania and Zealand, as well as two nations, Sweden and Denmark; since the date of this spatial union, different trends related to economic, cultural and social issues have been under the investigation of the academic work. The present research has the purpose to analyze the main characteristics and the key forces interesting a section of the economic sphere, gaining internationally more and more importance in every day life: commuting flows phenomenon. The current analysis provides insights concerning the descriptive characteristics of individuals interested by the phenomenon of commuting, with specific focus on the commuters travelling daily from the Swedish to the Danish side; besides an empirical investigation performed with negative and generalized binomial regressions studies the main influences of economic, as well as geographic factors boosting the phenomenon of commuting, more remarkable present in the Oresund region since the introduction of the mentioned infrastructure.

Keywords: infrastructures, commuting flows, labor mobility.

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"Fatti non foste a viver come bruti,

ma per seguir virtude e canoscenza"

Dante Alighieri, Divine Comedy

CHAPTER 1
INTRODUCTION

The 1st of July 2000 represents for Scania and Zealand, respectively regions in Sweden and Denmark, a fundamental milestone in the process of integration between the two Nordic areas; on that particular day, the opening of the Oresund Bridge came to reality, connecting the two regions with an imposing infrastructure. Since the realization of the Bridge, tons of daily workers have contributed to the increment of the commuting flows phenomenon, particularly significant from the Swedish side directed to the Danish one. Many expectations, hopes, and positive opinions have been associated with the realization of the Bridge, regarding an integration involving economic, political, and social spheres interesting the two areas. After ten years, the opinions of the subjects primarily involved in the Oresund Bridge project push the conception of positive results achieved in the transnational region, regarding economic, cultural integration even thanks to the massive Infrastructure; other parts instead consider it a too costly way of communication favouring exclusively part of the Swedish population living in Scania; it is not a easy task to define which considerations are more appropriate for the current situation, however it is undoubtedly clear that significant tendencies have occurred between the two regions, with specific attention on the commuting phenomenon.

1.1 Purpose of the research

Illustrating the phenomenon of individuals mobility, it has to be taken into account that this reflects many implications regarding different spheres, as economic, social, cultural, political to mention just a number of them.

However the academic world has focused its magnifying glass during the last years due to an increasing interest in the phenomenon, especially pushed by politicians and institutions eager to examine possible causes, reasons, consequences of a worldwide tendency.

Individuals mobility can assume several forms as international migrations, however the focus of the current analysis will have as aim the investigation over the mobility for work occupations, and more narrowed on a singular aspect of labour mobility: commuting flows of individuals, daily travelling from a location to another for their occupations.

The first purpose of the analysis ponders the interest on the trends of commuting flows before and after the introduction of a giant infrastructure in terms of financial costs and realization, as well as regarding the economic, political, institutional effect in the Oresund region: the Oresund Bridge. In a more specific context, a descriptive analysis will provide an overview of the phenomenon, with investigation over the more common characteristics of workers moving daily from Scania region to Denmark seen in the years.

Another function of the study aspires to investigate into a more deep chapter of the phenomenon of commuting, as the function of different factors in influencing individuals decisions in commuting from Sweden to Denmark.

The interest in the particular topics has been driven by different reasons: as stated earlier, the growing attention for labour mobility and commuting in particular has intrigued the academic world, with specific focus on the Oresund Region investigation; empirical studies since the realization of the Oresund Bridge have been carried on, related to the causes of a massive commuting movement from Sweden to Denmark (www.Tendensoresund.org); however no specific effort has been made explaining firstly detailed commuting analysis from different prospective, as demographic and geographic points of view; and secondly investigating over the labour market situation, as employment, unemployment, labour forces in both the regions, and their relations to the boost of commuting flows before and after the creation of the Oresund Bridge. The aim of the present work relies on the attempt to provide a contribution to the argument with a more selected analysis; and finally the fact of living and studying in the Oresund region gives additional curiosity and a sort of payback contribution that this work hopefully attempts to offer.

1.2 Research questions

After describing briefly the overall purpose of the current study, the research questions can be listed as it follows:

- Which are the main descriptive findings of the commuting phenomenon in the Oresund Region?
- Which elements might have an influence on the boost of the mentioned phenomenon?

1.3 Study flow

The present analysis is organized as follows: the chapter II gives a summary over the general information concerning economic, geographical and other features related to the region Oresund; plus additional information will be provided concerning the Oresund Bridge realization, costs and further implications. Chapter III deals with the literature contribution offering a brief overview regarding infrastructures and economic growth first, and successively the impact of transport infrastructures in boosting labour mobility, with specific case of commuting phenomenon. Chapter IV presents the methodology and the data used for the analysis of the research; chapter V describes the commuting flow evolution since 1997, with a final section illustrating the main results and findings related to the research topics.

1.4 Limitations of the research

Certain limitations need to be highlighted for the most accurate understanding and contribution of the current research. In the first place a limitation concerns the sampling group: in fact not the totality of cases of commuters from Scania have been taken into the analysis, as for instance the ones working in Frederiksborg County or other locations; this decision holds different reasons: firstly certain locations, as Storstroms or Bornholm, attract a very limited number of commuters during the years; thus including them in the analysis might have altered results due to a large distance, or low parameters as employment, wage differences and so forth. Besides other limitations concern lack of data regarding demographic features of commuters, as marital status, composition of households, main decisions for commuting: these information might have added important findings to the analysis, giving the possibility to scrutinize the phenomenon from a qualitative prospective, besides the quantitative one.

CHAPTER 2

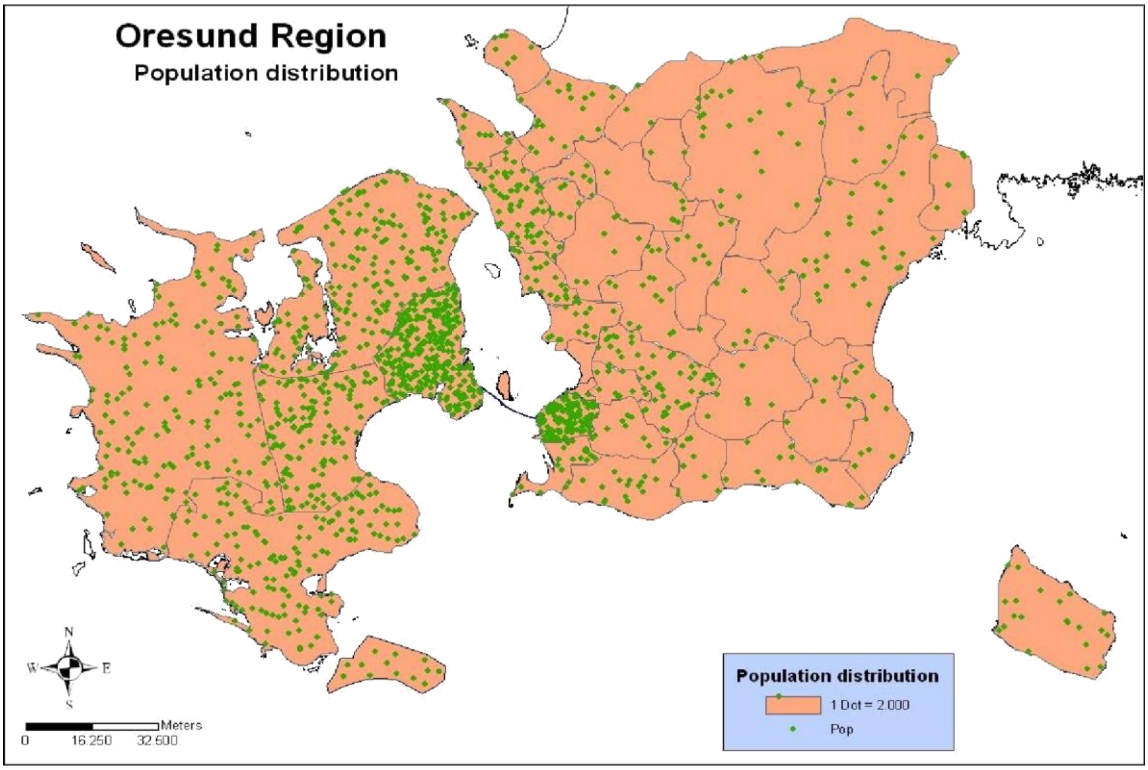
2.1 Review over the Öresundsregionen, cross border region

The Oresund region represents a concrete example of the CBR concept, cross border region, introduced in the 50s in Europe; the concept has seen a real intensification of its importance with the formation of more than 70 CBRs in the European context, just starting from the 90s (Perkmann, 2003). CBR can be defined as "*a potential region, inherent in geography, history, ecology, ethnic groups, economic possibilities and so on, but disrupted by the sovereignty of the governments ruling on each side of the frontier"* (Perkmann, 2003, p. 5). Although the Swedish context is characterized by more remote established cross border regions with Finland and Norway, recognized officially since the 90's, the Oresund region is classified as the highest cooperation intensity CBR for the Swedish government, in the sense of a significant participation among the regions involved, related to different fields, as economic and political cooperation (Perkmann, 2006, p. 160).

According to Lundquist and Tripp (2010, p. 1), creating the integration for CBR in terms of economic, social, cultural aspects leads to a complex process: several transnational regions experience, before and after the formation of an unique CBR, profound distinctions, consisting in "*dissimilar economic histories, technological trajectories and innovation capacities, institutional set-ups and positions in the regional system of their respective nations, as well as different social dynamics, political visions, governance structures, modes of regulation and cultural identities*"; however these differences might end in a process of CBR growth, since the disequilibrium might be compensated with the *"benefits from new and unexploited complementarities and synergies*" (Lundquist et all., 2010, p. 1). Which might be these complementarities and new synergies to exploit? The authors point out especially to benefits related to labour market, with an increase of it thanks to more balanced mechanics of supply and offer of labour force; other benefits gained by enhancement of labour specialization, competitiveness among firms of a larger and diverse CBR market, "*new opportunities for upgrading the competitive edge of the economy on both sides of the border*" (2010, p. 4). After having presented the Oresund region as a Transnational region, it is important to give some general information in order to present the overall view on the entire area related to issues as economic growth, territory, population, labour market and further.

Population: a total population of 3.7 million inhabitants circa. The majority of them is composed by Danish citizens, 2 465 000, and the rest including Swedish inhabitants from the

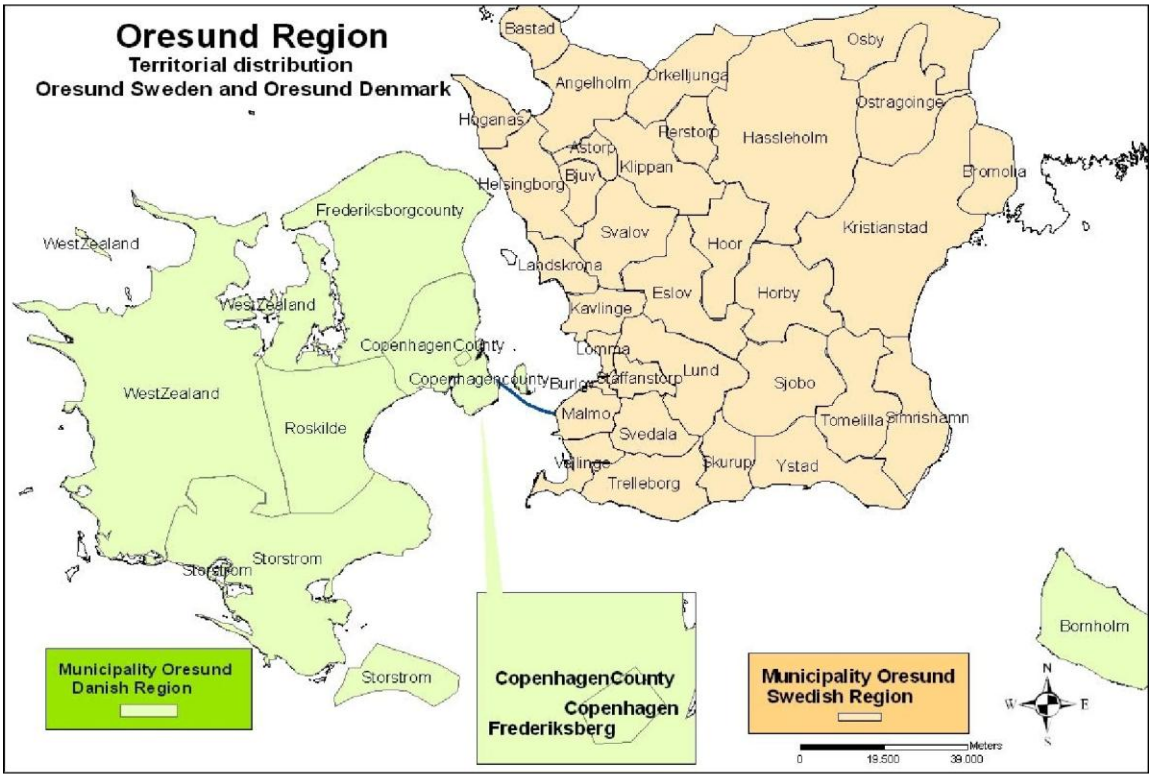
Scania region. The main cities as Copenhagen, Malmo, Helsingborg count respectively for 510.000, 281.000 and 125.000 inhabitants.



Map 1. Oresund Population Distribution. Own material created with GIS 9.3 software. Data from Orestat database.

Territory: the Oresund area measures 21 203 km2, formed by the Danish islands Zealand, Lolland-Falster, Møn and Bornholm and the Swedish region Scania, (www.oresundsregionen.org). The Swedish territory counts for a larger extension compared to the Danish side, corresponding respectively to 11369 km2 for the Swedish and 9834 km2 for the Danish one. The distribution of the population over the territory shows a more density allocation of inhabitants on the Danish part, with an average of 249 individuals per km2, against a remarkably lower density for the Swedish territory with 104 inhabitants per km2 (www.oresundregionen.org). The municipalities composing the Swedish side are 33, Hässleholm and Kristianstad as largest territorial ones. For the Danish side municipalities, a clarification needs to be brought in the current analysis: till the year 2006, Zealand region was composed by 103 municipalities, including Copenhagen; from 2007 the municipalities reform lowered the number reducing them to 46 units in the region (www.oresundregionen.org).

Concerning the current analysis, the different sections will deal firstly taking a regional prospective, Oresund region as entire unit, followed by the contraposition of the Oresund Sweden area, Scania region, and the Oresund Denmark part, Zealand region; focusing at the municipality levels, the Swedish territory will be analyzed both from the division of main territories as North West, North East and South of Scania, as well as at the level regarding the 33 municipalities composing the Scania region; for the Danish part instead, it will be a division of 8 areas, Copenhagen City and Copenhagen County, Frederiksberg City and Frederiksborg County, West Zealand, Storstroms, Bornholm, Roskilde to include the different 96 municipalities composing the Danish Oresund region. The map below shows graphically the municipalities distribution from both the sides of the Region.



Map 2. Municipality distribution Oresund Region. Own material created with GIS 9.3 software. Data from Orestat database.

Infrastructures: the main infrastructure is undoubtedly the Oresund Bridge; technical and economic aspects will be discussed in a following paragraph. The other significant components of the infrastructures set are: Kastrup International Airport, Malmo Sturup Airport, Copenhagen and Malmo central stations, City Tunnel.

Kastrup or Copenhagen airport is distant only 8 kilometres from Copenhagen City, 24 kilometres from Malmo in Sweden and it is situated on Amager Island. According to the statistics of the year 2009, almost 20 millions of mainly international passengers travelled from and to Copenhagen airport, circa 25000 customers per day: according to Mogens Kornbo, vice president Copenhagen Airports, this infrastructure can be considered as *"one of the world best airports due to its various connection ways as the Oresund Bridge, motorway, regional and intercity trains and metro service directly to the airport"* (www.cph.dk).

Malmo Sturup airport is far respectively 30 and 55 kilometres from Malmo and Copenhagen City. In the year 2009, more than 1.5 millions of passengers used the airport to move in or out from Sweden; the transportation connections consist in two highways, E65 and 108 and coaching service busses from and to Malmo City (www.lfv.se).

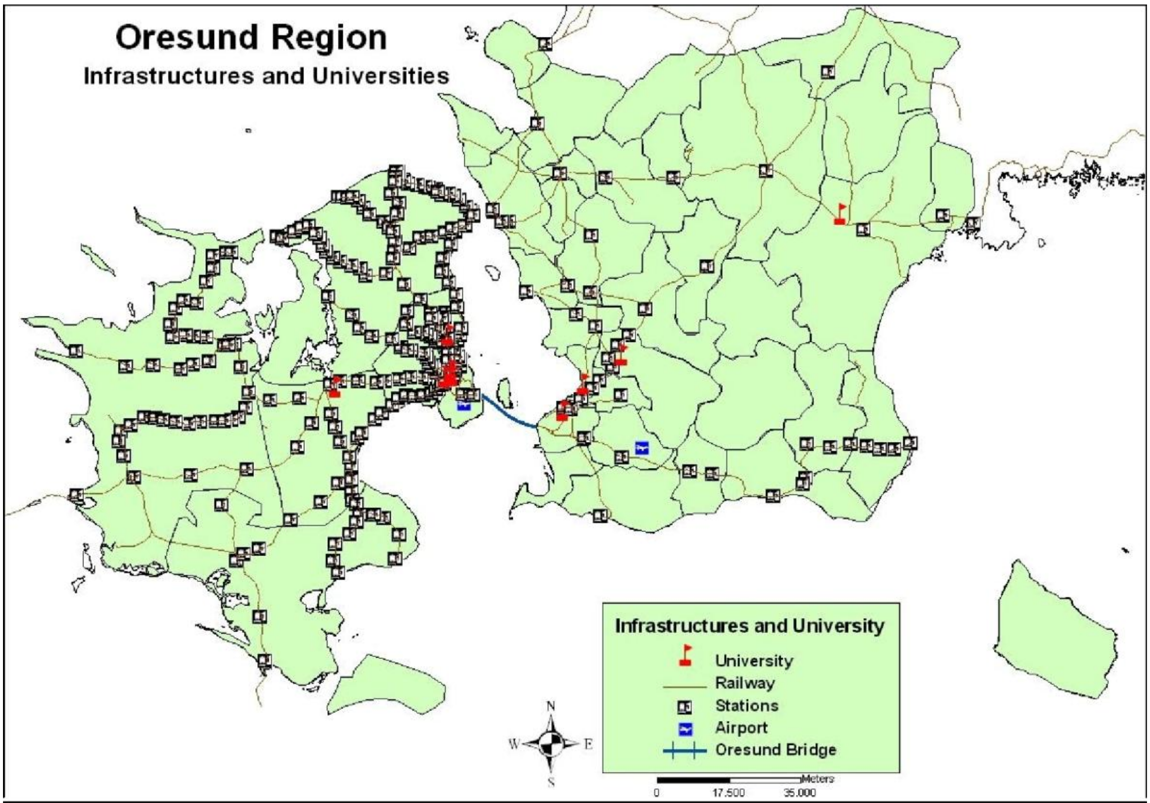
Copenhagen central station is the main rail station in Denmark, with almost 90 millions passengers travelling from and to in the year 2008 (Key figures for transport,2008, p. 11).

The station is connected to Copenhagen airport by metro and trains, with a time length of approximately 12 minutes (www.dbs.dk).

The Malmo Central Station is the third largest one in Sweden, following Stockholm and Goteborg in the national rank (www.oresundregionen.se). According to the 2008 rail traffic report, approximately 16, 5 million users travel from and to the Station, connecting the major cities in Sweden as well as Danish and other European ones with a daily average of 350 trains operating from and to Malmo.

The last significant infrastructure taken into consideration is the City tunnel currently under construction process, with estimated final realization for December 2010. The City tunnel consists of a railway connection through the City of Malmo with the existing linkage to the Oresund Bridge railway. According to the City Tunnel Facts and figures report, the realization of the massive project will increase substantially the passenger traffic by 40 from Malmo City through the Oresund Bridge connection, besides lowering the travelling times for the journey (www.citytunneln.com).

Education and research: the Oresund region represents in the European context one of the top spots for research production, on the levels of higher populated areas as Paris, London; this achievement is certainly due to the high concentration of education and research actors, as universities and science parks spread into the boundaries of the region (www.oresund.org): for instance, 14 universities gather together more than 165.000 students, with a significant share of international students, contributing to a global learning process involving different backgrounds, cultures. These institutions form together the well known Oresund University Consortium, an institution with the aim of creating opportunities for all the subjects involved in it, as universities, science parks, students, researchers, for an high quality and efficient collaboration for education and research (www.oresund.org). For number of students, the Oresund region biggest universities are Lund, Copenhagen and Malmo. Another fundamental characteristic of the Region regards the significant impact on the local development thanks to the presence of Science parks working alongside with education and public institutions: the so called " Triple Helix Model" or the collaboration among government, industry and academia (Leydesdorff et all., 2006) reaches an outstanding level in the Oresund region; the main feature embedded in the territory is, as stated by Linda Nielsen, former rector of the Copenhagen University, in "*a long tradition of co-operation between academic research and business. In many instances, universities have been fertile soil for the export successes of the industry in the 20th century. In recent years, science parks have grown into creative and dynamic arenas where several successful innovations have been developed all the way from concept to finished product"* (Focus Denmark, 2008, p. 18). For instance concrete projects have been established with the aim of collaborations between education environment and business sphere: Medicon valley Academy, boosting the relationship among universities in the field of medicine and companies interested in the field; The Virtual Oresund University, a partnership between IT based activities with subjects from the academic and industry related actors (www.oresund.org).



Map 3. Oresund Region and its infrastructures and Universities. Own material created with GIS 9.3 Software. Data from Orestat database.

Economic growth, industry and labour market: economic trends are the reflex of the remarkable evolution happened and nowadays still proceeding under several aspects of the Oresund region formation; in fact in the last years since the introduction of the Oresund Bridge, it is possible to analyze the dynamic tendencies regarding labour markets from the Swedish and Danish prospective, as well as economic growth and evolution of industry. The economic growth in the transnational region has experience in the period under analysis (1997-2007) a continuous increase in terms of GDP per inhabitant, reduction in unemployment levels, and increase in income per person. The following graphs prove the positive tendencies registered in the Region; the graph n.1 highlights the levels of gross domestic product measured by person,summing values from the Swedish and Danish areas; it is shown a continuous increment during the entire period.

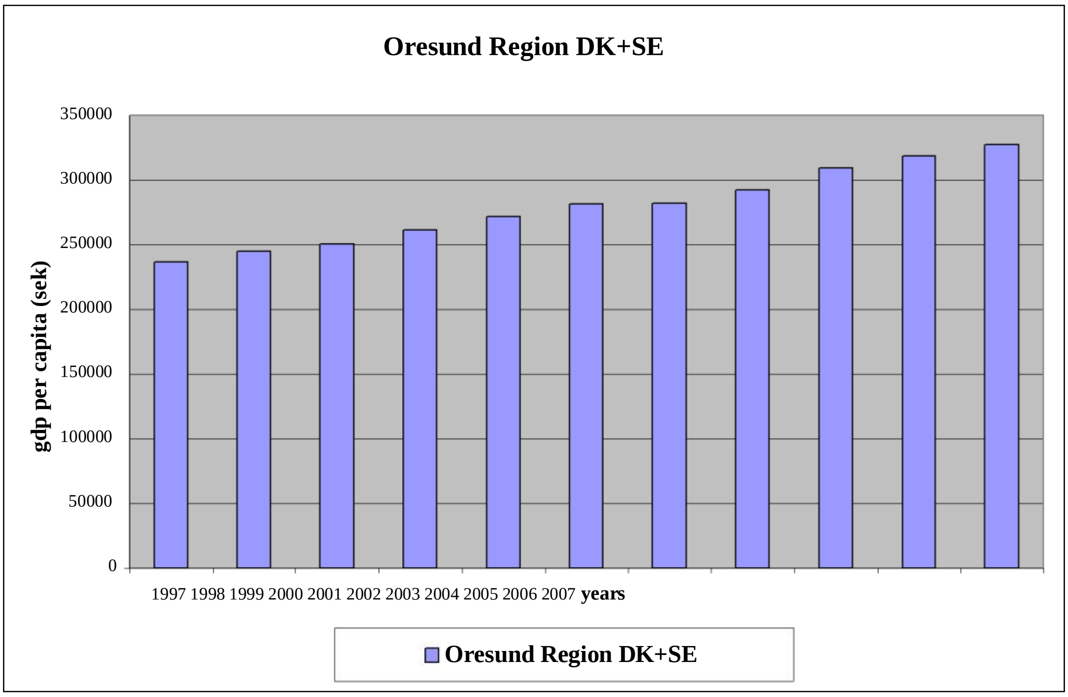


Figure 1. Gdp per capita in the Oresund region. Data from Orestat database.

However analyzing the trends from each side of the Oresund region, it is clear to notice a certain supremacy in terms of Gdp levels attributed to the Danish area, with a slightly constant difference with Swedish Gdp per capita measured in circa 50.000 Sek per year.

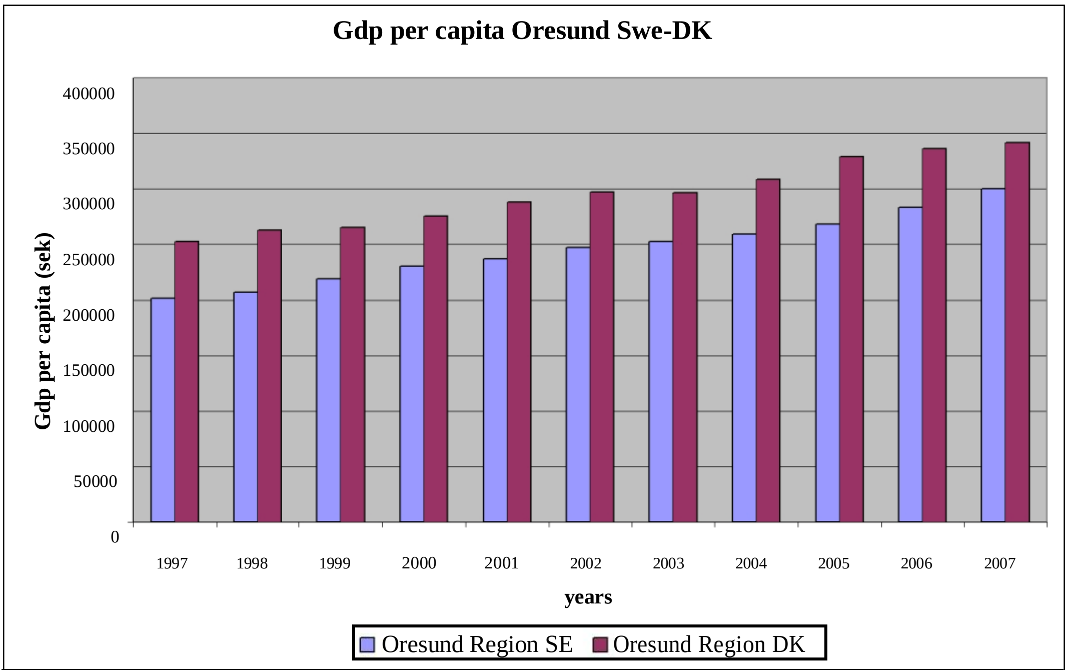


Figure 2. Gdp per capita Oresund Swe vs. Oresund Dk. Data from Orestat database.

Similar findings are highlighted by the Oresund trends report (2008), indicating as well about a partial slowdown of the economic growth since the year 2006 for the Danish side, and delayed to the year 2008 for the Swedish region: in fact as it can be accurately analyzed in the graphs n.2 and 3, the closest gap in terms of GDP/per capita in the two areas is reached in the year 2007, when the Danish side has been already affected by the economic slowdown, while the Swedish side still does not present signs of decrease in economic growth.

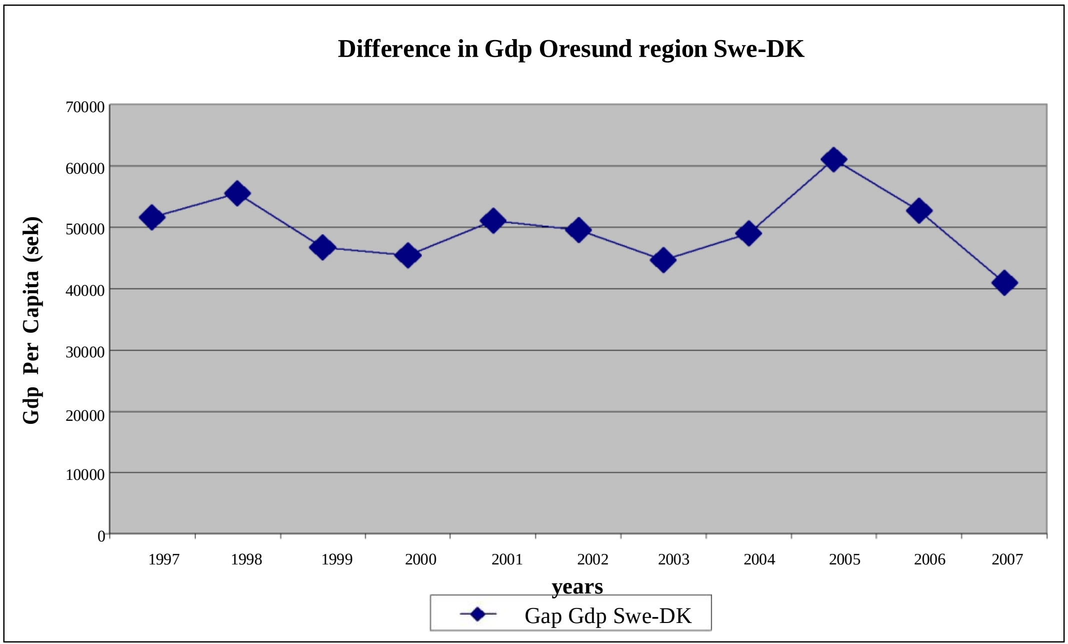


Figure 3. Gdp per capita Oresund Swe vs. Oresund Dk. Data from Orestat database.

Focusing on the region industry description, the Oresund area presents a remarkable supremacy of the service sector in occupying workers, as highlighted in the figure n.4.

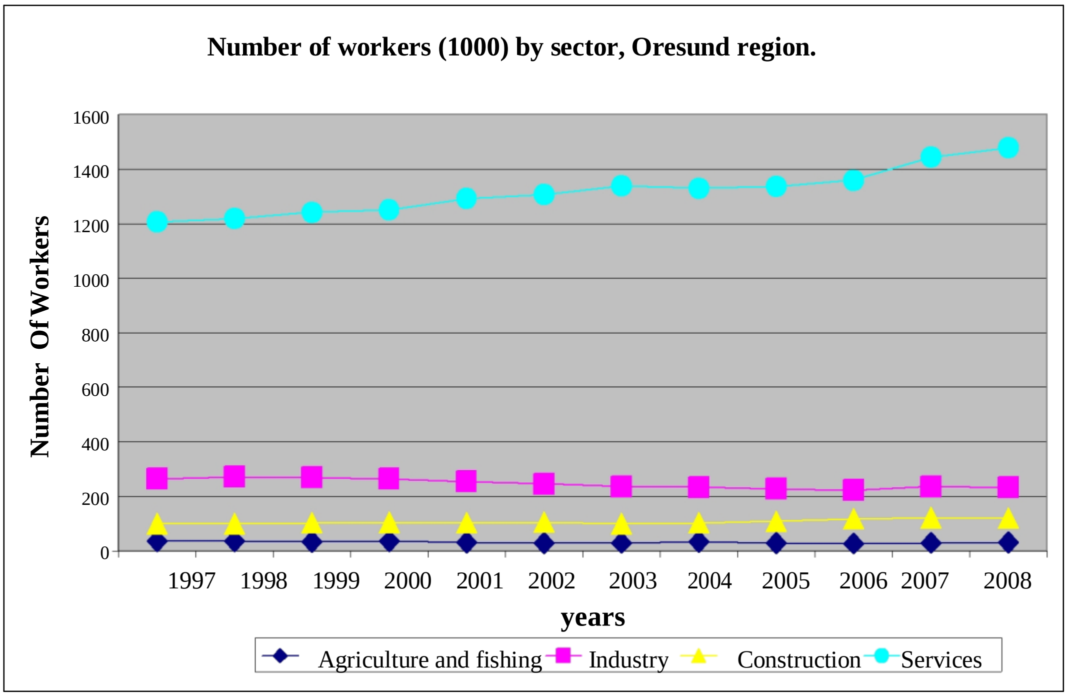


Figure 4. Number of workers by industry, Oresund Region. Data from Orestat database.

It is clearly seen that the contribution of service sector to employment counts for the highest amount of workers, with growing levels over 1200 workers for every 1000 persons; interesting increase is besides noticed in the two years 2007-2008, when the levels overcome the 1400 units. The second largest group is represented by labour force engaged in the industry sector, with a decreasing trend over the years; the third sector in the Oresund region is composed by workers employed in the construction sector, with a slight growing path during the period; finally agriculture and fishing industry contributes for the lowest amount of workers compared to the mentioned sectors.

Taking a further approach into the industrial trends more locally, it can be investigated how similar or dissimilar tendencies are evolving in the Region from the Swedish and Danish prospective: the graph n. 5 illustrates the situation of the different sectors in Denmark, with increase mainly in the service sector, a stable path for the industry sector, interested by a slight decrease from the year 2000; similar development for the agricultural and construction sectors, where the overall path tends to be kept stable over the period.

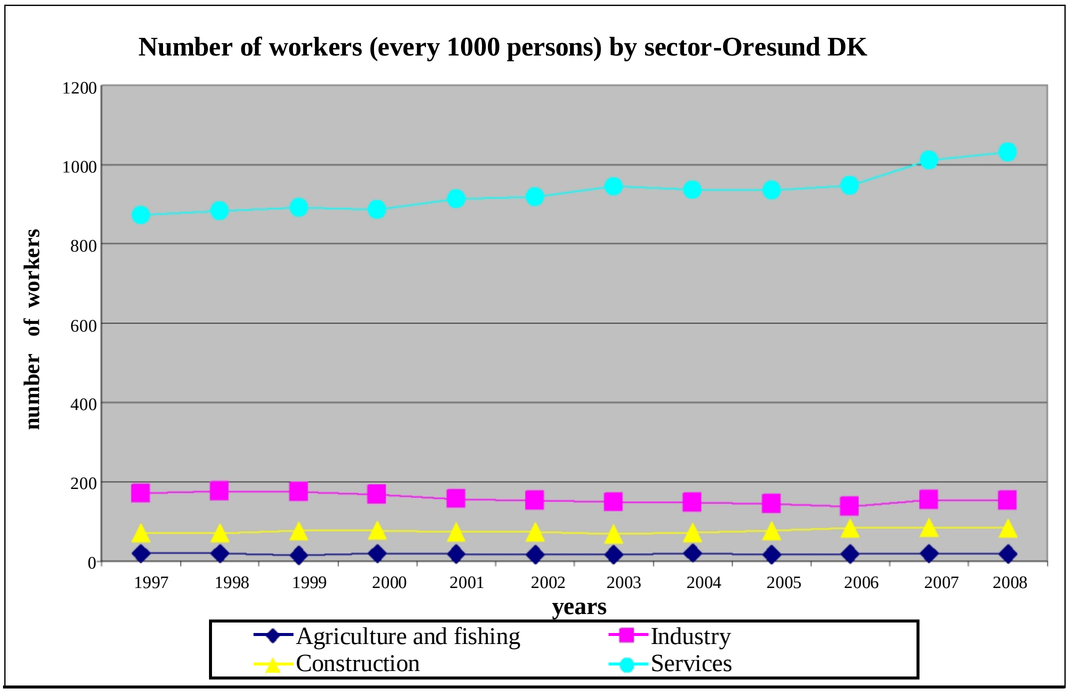


Figure 5. Number of workers by industry, Oresund Denmark. Data from Orestat database.

The figure n. 6 points at the development of the industrial context occurring instead for the Swedish side: the service sector increases significantly, moving from 330 units circa to 450 over the entire period, while the industry sector experiences a constant slope with a decrease from 100 to 70 units approximately. Finally construction and agriculture sectors react during the entire period in an opposite path: to a slight increase in the construction sector, corresponds a limited but constant decline for the agricultural part.

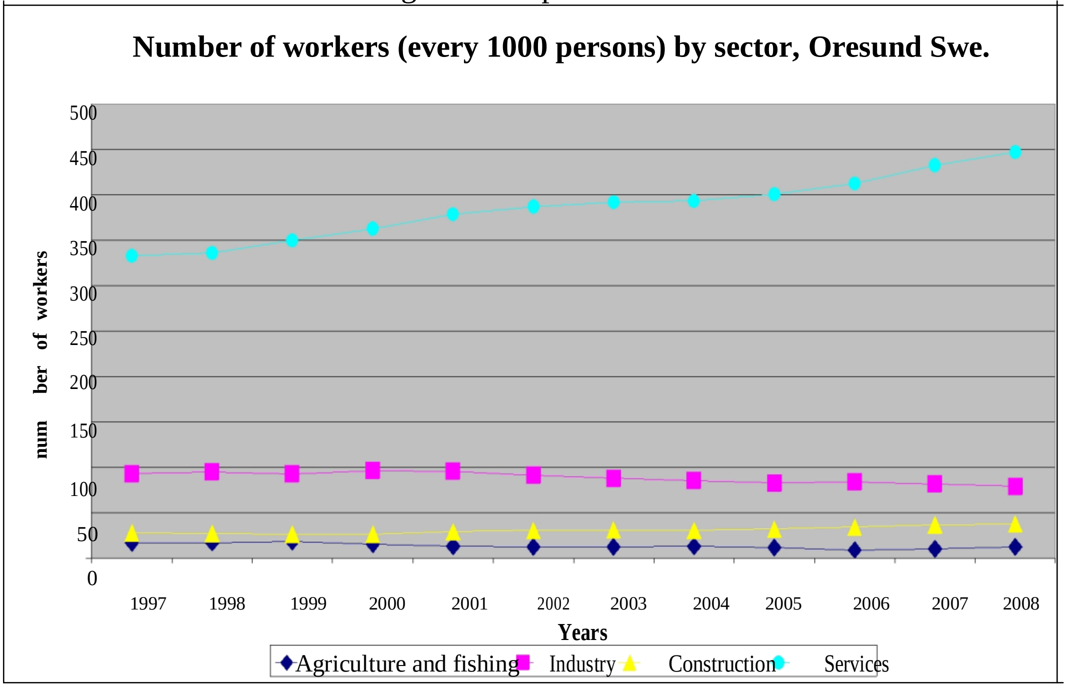


Figure 6. Number of workers by sector, Scania, Oresund. Data from Orestat database.

Finally, it is useful to compare the two different areas in a singular graph, n.7, to highlight the main dissimilarities and common features of the industrial context: although in both the regions the service sector excels being the main one for the economics, it is remarkably different the evolution during the period of this certain sector: in fact while for the Danish side the increase of service sector results in an increase of 3% from 1997 to 2008, in Scania the growth is certainly more remarkable, with a percentage of enlargement measured in 7%. The pattern registered for the industry sector can explain partly the decline of the service sector from the Danish and Swedish side: in fact the second group in the economic scenario, industry, has experienced regarding to the Scania region, a more notable decrease through the period 1997-2008; from a share of 19.7%, the industry sector drops to the levels of 13.7%, - 6%, while for the Danish side, the diminishing path registers a less remarkable decline, - 3.2%, moving from 15.1% to 11.9%. For the construction sector, not outstanding differences have been recorded in the time period; in fact both the Danish and Swedish areas present an overall constant tendency, with a slight increase experienced in the two countries. Finally, the agricultural sector can offer several differences for the Oresund region: in Scania, agriculture counts for a larger percentage in the total share of economic sectors compared to the Danish side: 3.6 % in 1997, in relation to 1.6 % in the same year for the Danish area. However a major decrease has interested the evolution of the sector in the Scania area: from the mentioned 3.6%, the final amount measured in 2008 corresponds to 2.1 %, a decrease of 1.5%; the Danish region instead passes from 1.6% to 1.4%, indicating a minor tendency of declining for the Danish side compared to the Swedish one.

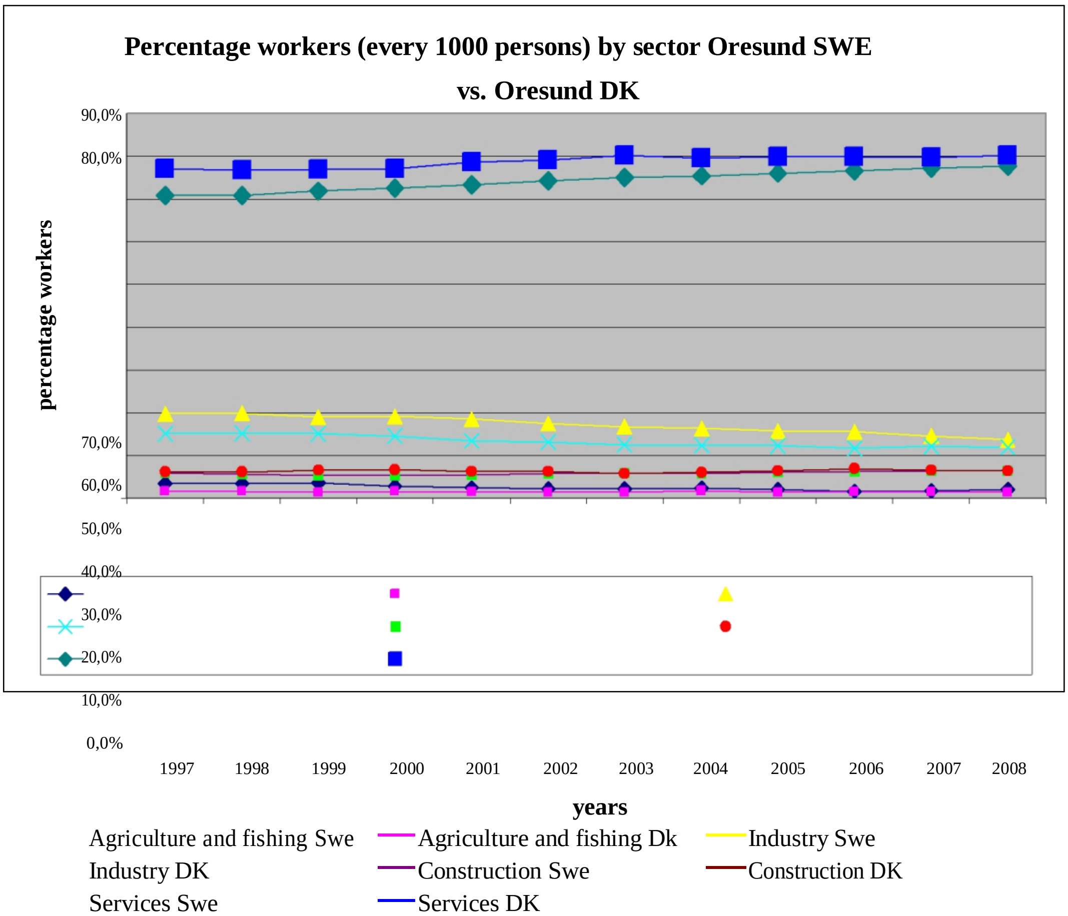


Figure 7. Percentage workers by sector Oresund Swe vs. Oresund Dk. Data from Orestat database.

Labour market: From 1997 the employment levels have experienced diverse trends of growth and slowdown in the entire territory of the Oresund region; in the year 2007, the total of employees exceeds 1.800.000 units, with an increase of 9% compared to the first year of evaluation, 1997. The graph below emphasizes the evolution of employment over the years: an uninterrupted growth has characterized the period 1997-2001, where an increase of 6%, 100.000 units circa, has meant the achievement of 1.750.000 individuals employed in the Region: afterwards the period 2001-2003, influenced by an economic slowdown affecting the Oresund area, symbolizes a reduction in terms of employment, measured in 30.000 units circa, a contraction of 2%. Finally the period 2003-2008 represents a new enlargement regarding employment units, moving from 1.710.000 circa to 1.821.000 individuals, an increase of 6%.

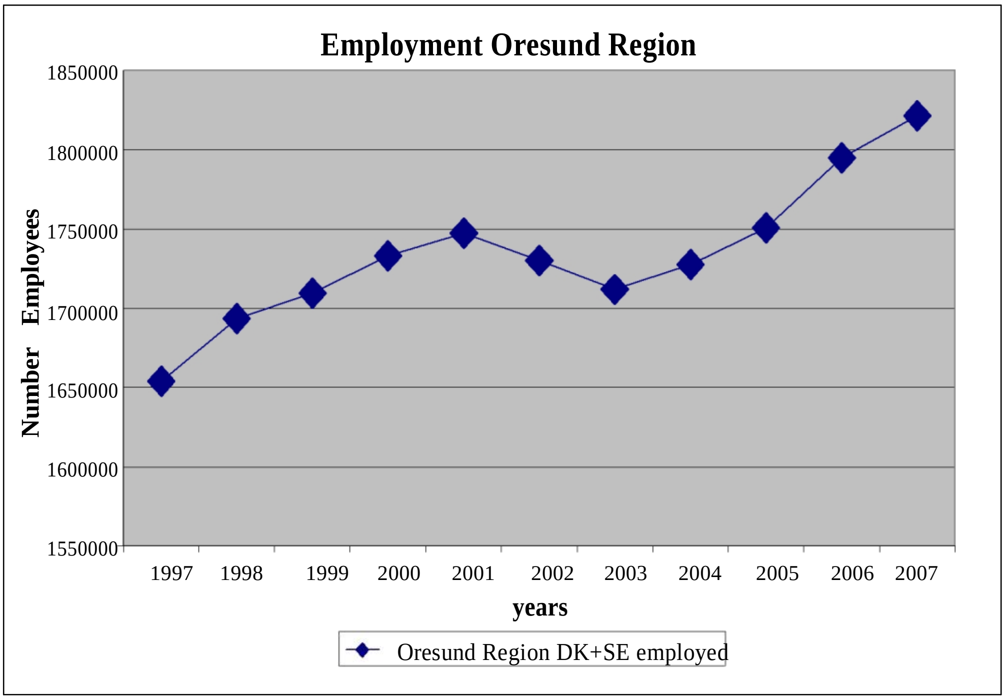


Figure 8. Employment in the Oresund Region. Data from Orestat database.

The Danish region counts for the majority in numbers of employment, with circa 70 % of the total share in the Oresund region: 1.270.000 units approximately in the year 2007.

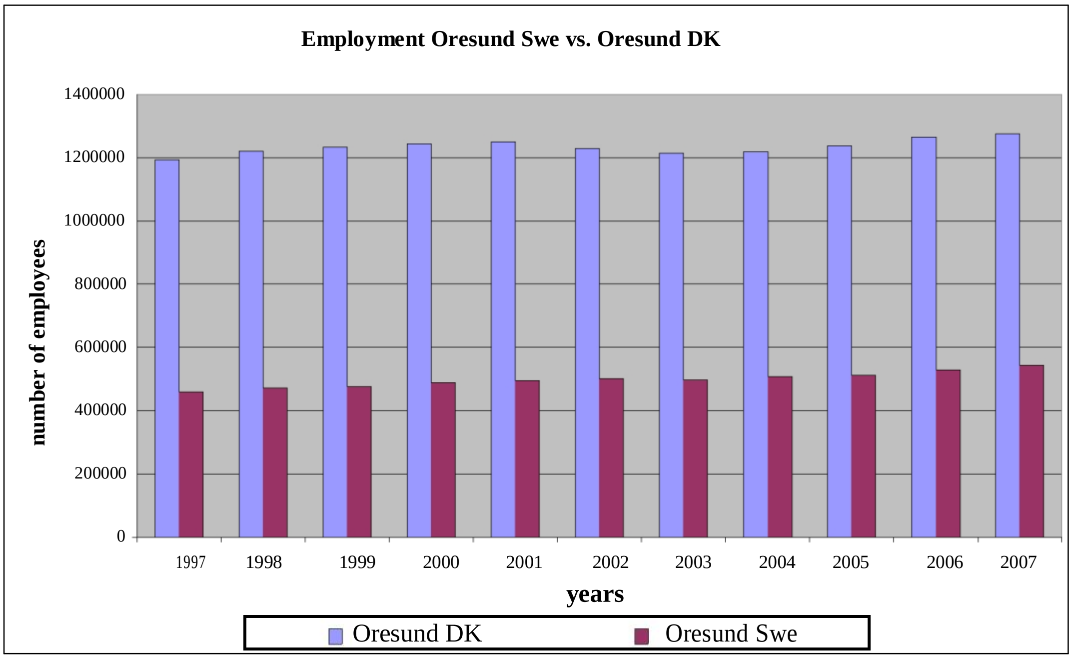


Figure 9. Employment Oresund Swe vs. Oresund Dk. Data from Orestat database.

Regarding the Scania region, the analysis sheds light on an increasing trend of employment rates during the entire period, with a slight contraction exclusively in the year 1999, -0.1%; from 459.000 units in 1997, an increment of circa 84.000 individuals, + 18.5% has meant a total of 544.000 employees in the Scania area. Different discourse has to be presented instead from the Danish side: starting from 72.2% in 1997, a decreasing phenomenon in terms of share of total employment percentage has characterized the area till 2004, reaching the lowest level of 70.6%, a contraction of 1.6%; however this evolution has meant an increase in terms of employees numbers, from 1.194.000 in 1997 to 1.219.000 in 2004, but with decreasing total employment share, due to the continuous increase from the Swedish region.

The table n.1 shows the percentages measured during the period, with a clear slowdown for the Danish region from the period 1997-2004, and on the contrary a growth from the Swedish area. The mentioned economic crisis from the period 2001-2003 has influenced the Danish labour market in terms of deceleration of employment units, while the Swedish labour market has continued to perform positively during the time-lag. In fact the Danish one increase in terms of employment units from 1997 to 2007 is measured in +6.9, compared to the +18.5 of the Swedish labour market.

Table 1. Total percentage share employment Swedish and Danish region.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Oresund DK	**72,2%**	**72,1%**	**72,2%**	**71,8%**	**71,6%**	**71,0%**	**71,0%**	**70,6%**	**70,7%**	**70,5%**	**70,1%**
Oresund Swe	**27,8%**	**27,9%**	**27,8%**	**28,2%**	**28,4%**	**29,0%**	**29,0%**	**29,4%**	**29,3%**	**29,5%**	**29,9%**

Oresund, Logistic centre: The Oresund region symbolizes for the Nordic countries a fundamental spot for economic development, besides being a strategic gateway of connection between the Scandinavian area and the European continent. According to the report "TendensOresund", 2008, among the Nordic Countries, the Oresund region has the highest score in the multimodal accessibility index, measurement for establishing the accessibility of individuals to the Region by different means of transportation. Thanks to the proximity to Kastrup airport, the good connections by rail to the rest of Europe, high levels of road network, the Region geographically outside the core of the Continent still can benefit and enhance accessibilities due to its transportation means. Taking singularly, Scania region represents a logistic centre in the Nordic countries capturing more than *"25% of incoming goods from Europe and the World directed to Scandinavia"* (www.Invest.Scania.com). Being connected physically through the Oresund Bridge to Denmark and the rest of Europe, Scania represents a competitive freight transports location, obligated path for goods to reach the Continent. This situation has been exploited and nowadays still does by international firms investing in logistics strategic spots, both in Scania and in Zealand, Danish Oresund region.

2.2 Oresund Bridge overview

The Oresund Bridge represents the territorial rejoining of Denmark and Sweden after 7000 years, when the two territories were connected by the Oresund threshold, afterwards covered by the sea level rise due to the glacial era ending (Nils-Axel Morner, 1995).

The massive construction is composed by the main bridge, a tunnel and an artificial island called Peberholm.

The bridge's structure presents a four lane road and two rail tracks of a total length of 8 kilometres, without counting the tunnel and the artificial island Peberholm lengths, adding 8 more kilometres to the entire structure. The bridge has been entitled of being the longest European road and rail combined link, and rewarded in 2003 with the prestigious the IABSE Outstanding Structure Award, thanks to construction planning, innovative structure, environmental impact and time and budget management (Oresund Bridge, www.roadtraffic-technology.com/projects/).

The artificial island called Peberholm has been created in order to connect the Bridge and the underwater tunnel from Kastrup peninsula to the artificial island. Its length is measured in 4 kilometres with two rail tracks and four road lane road (The Oresund Bridge and its region, 2009).

The immersed tunnel has been constructed behind the Drogden Channel, “Oresund’s busiest navigation channel” (The Oresund Bridge and its region, 2009, p. 44). The main motivation of projecting the Bridge with the final tunnel section has been for avoiding possible interferences with air traffic of the Copenhagen airport (The Oresund Bridge and its region, 2009).

The fixed link connecting Sweden and Denmark has been the result of an intense process combining different subjects playing in the realization of the massive construction, as public institutions and private enterprises. The development of the Bridge planning and final realization can be summarized in the following steps:

- In 1991, the official pact between the governments of the two Nations was signed and ratified by the Parliaments.
- 1995 has been the year of construction initiation, with the choices taken by the Oresundskonsortiet of the enterprises involved in the project.
- In 1999 the construction was officially ended, with the first car and train trips through the Bridge.
- On the day 14th August 1999, the official opening ceremony has seen the meeting of the Crown Princess Victoria of Sweden and Crown Prince Frederik of Denmark on the Bridge to symbolize the reunion under several perspectives of the two neighbouring Countries.
- In July 2000, the Construction was officially opened for public use with both train connections and road trips.

2.2.1 Costs for the Oresund Bridge

For the realization of the entire infrastructure, the Danish and Swedish governments have, through the creation of the Oresundskonsortiet, set the rules for the financing, ownership and management of the Oresund Bridge. In fact the two main enterprises, Svedab AB and Sund & Baelt Holding A/S respectively from the Swedish and Danish side, invested in the project 0.3 and 1.1 Euro billions, while the rest of the capital has been paid by Oresundskonsortiet, for a total of 4 Billion Euro.

2.2.2 Political and institutional contribution for Oresund Bridge and Region

In the agenda of the two nations’ governments the realization of the fixed link through the

Oresund Strait has been a recurring argument since the 19th century, abandoned several times for different reasons, technological, economical, political as the most influencing ones (Lofgren, 2008, p. 198).

The turning point leading to the final agreement by the two governments was achieved in the last decade of the 20th century, pushed by a stagnation in the economy of both the Nordic nations, and more specifically for the local areas of Malmo and Copenhagen; the two cities were facing high levels of unemployment and waning industrial sector (Lofgren, 2008, p. 198).

The investment in the infrastructure was seen firstly as a mean to boost in the short run the economy of the area, involving mainly local companies in projecting, material supply, workforce and management of the massive work: among all, regional enterprises as the Swedish Skanska AB or the Danish Monberg & Thorsen A/S , were primer actors in the realization of the Infrastructure. Other institutions as the Danish Maritime Institution were chosen for collaborating in the project (www.structurae.de). In the long run investment, other factors besides economic cooperation between the two regions played an important role in favour of the Oresund bridge realization: cultural integration between the two Nordic countries, Oresund region creation seen as a fundamental European transnational reality, profitable means for political and educational collaboration for the two neighbour Nations.

The Oresund Bridge might be considered as the most tangible step taken by Denmark and Sweden for the territorial, as well as cultural, political and economic integration of the two countries; however since 1993 the Oresund unification has been in the agenda of the Oresund Committee, a political institution formed by seven representatives from Denmark and five from Sweden with the aim of promoting projects embedded in the regional context.

The importance of the regional institution has been recognized significantly at the European level in the form of EU funding, testified by the numerous projects financed with a total investment of 44 Euro millions since the year of the Oresund committee creation (www.oresundkomiteen.dk).

CHAPTER 3
THEORETICAL FRAMEWORK

3.1 Introduction

The interest of the following paragraphs will not exclusively be directed on the theoretical approach concerning labour mobility and implications with commuting and migration tendencies, but as well it will shed light on the context of infrastructures, their impact on economic growth and contribution in boosting the mobility of workers between different areas. The chapter will present a brief introduction of infrastructures definition and historical development, their contribution to economic growth and in a more detailed analysis, transport infrastructures helping the individuals mobility boost. The central part of the current chapter will inquire into the labour mobility theory and commuting phenomenon, with a precise literature review.

3.2 History and definition of infrastructure

Nowadays the concept of infrastructure symbolizes a milestone in the economic, social, cultural development for numerous entities, as private and public investors, as well as cities, regions, governments; a particular importance to the concept has been addressed with a remarkable pick during the 90's by the academic world, focusing especially on the acknowledgement of infrastructure over the enhance for a more favourable economic, as well as cultural and social development due to its contribution (Prud'Homme, 2004).

Giving a precise and adequate definition of infrastructure has been recognized as a complex task due to the broad literature impact and different classifications of the argument, according to the context to which it refers. Besides, as indicated by Simkunaite et all. (2009), the importance of a clear and satisfactory explanation influences positively the outcomes of the research regarding the infrastructure issue and its impact.

One of the first attempts in defining the issue has been thanks to the U.S. Council State Planning Agencies study 1984, in which infrastructure represents a set of facilities with the aim of supplying social and economic services for both public and private utility (Moteff et all., 2004, p. 2). According to the "American Heritage dictionary", infrastructure can be described as *"the basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions including schools, post offices, and prisons"* (Moteff et all. 2004, p. 5)

The mentioned definitions provide a broad image of the issue, however more scientific understanding is needed for the present research. Snieska and Simkunaite introduce the concept of infrastructure divided in economic and social ones: the first group includes the different activities with the aim of supporting economic development; in this sphere roads, telecommunications, highways, airports and all the different means included in the transportation context, are considered as components of the economic category of infrastructures; the second set embraces all the activities that sustains health, education, cultural development, with a public use for the population (Simkunaite et all., 2009, p. 5).

Furthermore the concept of infrastructures can be associated with the word “assets”, the means for the infrastructures to provide services:

- infrastructure assets that combined with labour are meant to produce capital or intermediate goods;
- infrastructure capital that combined with labour is meant to produce final goods and services;
- infrastructure capital that combined with other forms of capital has the aim to improve their productivity (Baldin et all., 2008, p. 3).

In conclusion, an additional definition provided by Prud’Homme can summarize the concept of infrastructure attributing to it the following characteristics:

- Infrastructure seen as capital goods, not consumed directly, high capital investments requiring, with the aim of producing services;
- Infrastructure seen as long term pay back investments, often its costs to be depreciated after years following the realization;
- Infrastructure seen as long duration works, implying further maintenance, management and renovation costs;
- Infrastructure commonly relates to immobile entities, embedded territorially to the locations where these are realized;
- Infrastructure seen as risky investments subjected to the market failures; the importance of public intervention is crucial for the positive realization;
- Infrastructure seen as favourable and profitable in terms of economic and social growth for both enterprises and households (Prud’Homme, 2004).

The scheme below summarizes briefly the different characteristics and features explained in the previous paragraph:

Infrastructure

basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions including schools, post offices, and prisons.

Economic infrastructure	**Social infrastructure**
activities supporting economic development; roads, telecommunications, highways, airports etc.	activities that sustains health, education, cultural development, with a public use for the population

- capital goods, not consumed directly, high capital investments requiring, for producing services;
- long duration works, pay back achieved after several years
- maintenance, management and renovation costs to be included in the investment
- immobile entities, embedded territorially to the locations where these are realized;
- Infrastructure seen as risky investments subjected to the market failures; the importance of public intervention is crucial for the positive realization;
- Infrastructure seen as favourable and profitable in terms of economic and social growth for both enterprises and households

Figure n. 10 Summary of infrastructure theory description.

3.3 Economic growth and infrastructure

The relation among infrastructure and economic growth has meant a massive work by the academic research in order to analyze the effects of the first over the second. Following the escalation of academic interest in the concept of infrastructure, the impact of it on the economic growth has been another "hot argument" for researchers starting from the 80s. Although the remarkable literature contribution, still the mentioned relation is pointed to be "controversial" due to the different studies and results achieved by that. According to the report redacted by World Bank from 1994, *"infrastructure is recognized as one of the most important engines for economic growth"* (Estache et all. 2008, p. 4): indeed data provided from the same report highlights the importance addressed by governments in using infrastructure to boost economic growth: 12 of the Official Development Assistance (ODA) funding, equal to 100 billion U.S. in the year 2007, received by the developing world is invested in infrastructures (Estache, 2008, p.

2). Baldwin and Dixon summarize the impact of infrastructure with three main arguments:

- supports economic growth
- it enhances quality of life
- it is important for national security (2008, p. 8).

Bob Finlayson concentrates the attention of the argument over the case of developing Asian countries; firstly the author defines two different roles of infrastructure to analyze their impact on economic growth: infrastructure as intermediate and final goods. In the first case the infrastructure impact influences the labour and capital mobility, lowering trade costs from both internal and external markets (Douglas et all., 2009); infrastructures understood as final goods move ahead life standards due to service availability, improvements in mobility, access to basic needs, progress in welfare and incomes due to the widened possibilities achieved.

A prestigious contribution to the infrastructure and economic growth relation is offered by the Diamond model, one of the most known concepts from the author Michael Porter: explaining the possible reasons for competitive advantage of nations, and automatically of firms established in them, Porter lists, among other features, infrastructures as one of the factor conditions, fundamental to create the competitiveness of nations and firms. Thus economic growth might consequently be boosted by the efficiency of the mentioned actors in creating a competitive advantage, even thanks to infrastructures (Porter, 1990).

Besides its important as well to distinguish the positive impact from infrastructures focusing on the short and long term economic effect: in the short run, the main aspects of favorable influence are made available from the job creation due to the infrastructures realization, related and supporting industries involved in the construction process; in the long run, positive contribution to economic growth is driven by long term occupation due to the maintenance of the infrastructures, increase in income due to the improvements of living and conditions (Canning et all, 1999, p. 7). The literature review proposed in the present paragraph analyzes the positive approach of infrastructure related to economic growth; however several authors have been proved in their works a less positive perception of the infrastructure impact over economic growth: as Snieska and Simkunaite emphasize, it should not be forgotten that the realization of an infrastructure cannot "create economic potential" by itself, but the fusion of positive and suitable conditions with it realize a boost in the economic growth (2009, p. 2).

Additionally it has to be kept in mind that the different empirical results and studies are due to a different selection of variables, or different econometric models used for the estimation of the infrastructure impact (2009, p. 20).

3.3.1 Economic growth and transport infrastructure

As emphasized in the previous paragraph, the term controversy is used partly to describe the infrastructure effect over the economic growth; however this perception of ambiguity seems to be not embedded in the relation among transport infrastructure and economic performance; according to Prud'Homme, since Adam Smith and his theory, the importance of transport infrastructure has been fundamental for the advance of economic growth (2005); empirical results to prove the advantageous relation have been analyzed in numerous cases: one of them is presented by Banerjee et all. (2009, p. 1) concerning the Chinese cities example of positive correlation among "proximity to transportation networks and per capita GDP growth rates across sectors". A deep contribution on the argument is drawn by the authors Lakshmanan and Anderson presenting a triple approach from the macroeconomic, microeconomic, and general equilibrium effect prospective. Following the first approach, the authors state that transport infrastructures investments are a direct force influencing positively "*the Gross Domestic Product, together with the traditional forces of labour and capital in the production function"* (2002, p. B9).

The microeconomic approach is consisting of a more structured and detailed scheme of different factors boosting public and private sectors:

- distances and congestion: in realizing or improving existing infrastructures, two main reasons are stated as cost reducing factors, reduced distances and congestion. Reducing the distances of a trip between two points or reducing time to reach a location will reduce as well transportation input per unit of production, calculated in vehicle kilometres or hours, with the result of productivity improvements (2002: B 11).

  For instance, the Oresund Bridge has reduced significantly transportation time compared to the ferry routes, circa 30 minutes for a train trip from Malmo to Copenhagen against the previous 60 minutes circa using ferry transportation for the same route (www.oresund.dk).
- Logistical adjustments: logistical adjustments are all the phases embedded in the process of accumulating and distributing products to the final customers or distributors; to lower the costs from the storage till the distribution, firms are in need of more accessibility to transportation services.
- Firms are willing to locate their facilities in the agglomerative area where the infrastructures are based: this would mean a concentration of firms' activities and facilities in a determined location, achieving costs reduction from scale economies and contributing as well to the development of the area where they are based (2002, p. B11).
- Value added and transportation: faster services and transportation infrastructures not only enhance quality of products and services due to a more accessibility to them, but allow firms to enter new markets not available previously due to a lack of infrastructures

or due to complications in delivery services and products (2002, p. B12). Although the theoretical background provided in the paragraph shows an exhaustive list of arguments proving the relation among the transportation infrastructures benefits over the economic growth of determined subjects, it is important to keep in mind what several authors highlight concerning the theories, indicating that transportation infrastructures benefits are context dependent (Smiliskate and Snieska,2009): this statement supposes that other factors influence in a more or less extent the positive outcomes provided by infrastructures, as pre-existing transportation services, markets sizes of the areas connected, differences in wages. Besides a final point related to the mentioned statement is provided by Cohen and its analysis on the benefits of transport infrastructures and relation to economic growth: the types of infrastructures; in fact certain investments are less or more effective for the economic prospective in relation to other infrastructures and existing facilities: the example of a new airport with a poor road network and connections to other areas gives the idea of the diversity and influence of certain infrastructure in an economic context (Cohen, 2007).

3.3.2 Labour mobility and infrastructure

The current paragraph takes into consideration the study of the infrastructures serving the labour mobility between different areas. Empirical results have given a consistent credit to the influence of economic growth of the areas attracting labour force as one of the factors of labour mobility, as well as the pressure induced by high level unemployment zones to direct workers to less unemployment average areas (Eliasson et all., 2003). However the contribution of transport infrastructures does not have to be undertaken in the analysis regarding labour mobility: according to a report promoted by the Bank of Israel, investing in transport infrastructure ensures the creation of a merge between periphery and central areas, with facilitation for workers and firms to match; the study in fact proves empirically that there is a positive correlation between commuters increase and rail and road transportation investments in Israel in 10 years time lag (Frish et all., 2010). Additional empirical results are proved by the case of Makassar, Indonesia (Anwar, 2004), where the improvements and new investments in road infrastructures have turned to be fundamental for the mobility of workers from remote areas to the main city of Makassar, especially to cover the uncontrolled increase in vehicles in the last decades of the millennium in the area.

3.4 Labour mobility theory

Labour mobility is indicated by Oxford Encyclopaedia of Economic History as the changes in locations for workers regarding both geographic areas or into the same labour market but across different firms (Ferrie et all, 2002). The first phenomenon is called geographic mobility, while the mobility between different jobs is defined as occupational one: the latest presupposes a vertical and horizontal dimension, with the first specifying the moving from similar jobs with similar socioeconomic characteristics, for instance doctor and surgeon; the second pointing to the situation of mobility from a better to a worse job and vice versa.

A significant importance is devoted to the impact of labour mobility on economic growth, both in terms of geographic and occupational mobility; movements of workers to other geographical areas boost many benefits, as exploitation of new opportunities offered by the new comers, knowledge sharing, related activities contributing to new economic prospects as accommodation costs, living expenses for the individuals moving in the specific location. At the same time individuals moving to other destinations achieve personal advantages: economic benefits for the new comers in their status due to higher wages, better working conditions (Ferrie et all, 2002).

However as indicated by Mocetti and Porello (2010) labour mobility might be associated with negative features as well; a continuous and remarkable flow of workers directed to a different area from the native location lowers the human resources levels of the outgoing zone, even more notable when movers are high skills individuals. This mentioned phenomenon, indicated as brain drain, has been and it is nowadays with more remarked emphasis a problematic affecting mainly countries from the developing world, as described by Anna Lee Saxenian in her literature contribution "*The New Argonauts: Regional Advantage in a Global Economy*"(2006). For the better explanation of labour mobility flows and its regulations, it is wise to mention the theory presented in the 70s by Everett Lee, concerning the notion of the push and pull effect: pushing an individual to migrate is defined by conditions embedded mainly in the labour market, as low wages, low employment opportunities, low life quality standards as well as deficient work conditions appeared in the origin region of the movers; the individual is pushed by these conditions of the labour market, and pulled instead by the opportunities offered by the destination country: in fact the pulling effect is mainly driven by the opposite conditions of the origin country, listed as higher employment possibility, better working conditions related to higher compensations for employees and other positive factors (Lee,1966).

An important chapter of the labour mobility issue relates to the distinction between different classifications of workers mobility: daily commuting, long-distance travel, residential mobility, and international migration. For the purpose of the analysis, the focus will be directed exclusively on the description and theoretical support related to commuting phenomenon. Although many efforts from the academic world have been addressed on the input of labour mobility, a certain limited attention in terms of research has involved the investigation over the commuting trend.

Commuting can be defined as the daily workers movements between the residence and the working place, mainly by transportation means as cars and trains (Gustafson: 2009). In the recent years, due to improvements in transport mobility, enlargement of markets, daily commuting has achieved remarkable levels and constitute a crucial aspect in the labour life of individuals. Many aspects of the phenomenon have been analyzed to give an overall description of reasons, characteristics, differences in the commuting of workers. Firstly, among the various factors influencing the decision of choosing to commute, there are three groups belonging to the economic, socio-demographic and geographic prospective.

3.4.1 Determinants of Commuting: socio-demographic reasons

Socio-demographic aspects have been considered an additional share in the decision process involving individuals in travelling for short or long distances to reach the working place. According to the study promoted by Stutzer and Frey regarding German commuting phenomenon, the individuals are highly influenced in daily travelling not exclusively by economic factors, but by psychological ones as well that persuade or impede workers in commuting: travelling time, satisfaction with transportation infrastructure to reach workplace, trade-off between time spent in travelling and time spent for personal relations: longer is the daily journey, lower is the satisfaction of individuals commuting daily (Frey et all, 2007, p. 6).

Sandow and Westin, focusing on the commuting phenomenon occurring in Sweden, point out the theory concerning mobile and sedentary society: for mobile society the authors stress the idea of an increment in modern age of workers mobility due to easier transportation means accessibility, higher possibilities to private transportation as cars, and a transformation of the traditional localized labour activities view to a more dynamic and enlarged labour market, having as requirement the mobility of individuals. To this society type, Sandow and Westin oppose the sedentary society view: from a psychological and individuals relational view, subjects are reluctant to move: temporary or permanent loss of individuals relations due to distance, as well as the difficulty to recreate new social networks in the destination place slow down the will of individuals in changing residence, instead pushing the decisions of commuting as solution (Sandow et all, 2010).

Another important component in the decision of commuting relates to gender: different studies have been carried out with similar findings showing positive correlation among male individuals and commuting (Koppelmann et all, 2001); male individuals are more willing to commute compared to female ones. Besides the component distance contributes to the decision of commuting, and to which distance commuting is considered as solution: again empirical studies prove that man commuter travel longer distances compared to women; the causes for this disparity can be found due to involvement in family, household responsibilities (Collier et all, 1994).

An additional factor related to individual features concern the age of the commuter: according to Ohman and Lindgren (2007), young commuters have more propendency to migrate, while the necessity to commute appear in relation with older groups of individuals; the reasons might be explained by local attachment of middle age groups compared to young individuals, as well as more practical difficulties for middle age workers in migrating, especially when families are involved as well in the process.

Education is considered another component in the decision of commuting, influencing as well the decisions of travelling for a short or long distance: according to Sui and Trendle, human capital theory affirms that "*individuals with higher education attainment will be prepared to travel greater distances in order to earn higher incomes compared to those who invest less on education*" (2007, 224).

3.4.2 Determinants of Commuting: economic reasons

Why individuals decide to commute? What are the benefits in travelling to a different place for working? Which factors might be listed as constrains for the phenomenon of commuting?

Controversial studies give higher or lower acknowledgement of different economic factors influencing individuals choice in commuting, but the common view relies on issues as disparities in wealth of different areas, higher salaries, better working environment, high unemployment level in the region of origin, balance between more affordable housing and labour market and gender disparities in commuting (Frey et all, 2007).

A study by Presman and Arnon, 2006, identifies in the difference in wages from a zone to another as the influencing factor increasing commuting phenomenon across the areas, convincing thus individuals to move.

Another significant motive of commuting is related to the labour market situation registered in the different areas at the regional, national or international context. In fact unemployment levels have been considered as a main decisional force for commuters: in an Italian study by Mocetti et all., the majority of the commuters interviewed have pointed at the lack of job offer, in other terms unemployment rate, as the main reason to commute to another area (2010). Similar trend is recognized as well in a study over the migration patterns occurred in Sweden in the last decades, indicating unemployment level effect as the main motivation for out migration, that can be associated to commuting flows as well; according to Westerlund (1998, p. 366) *"high unemployment in a region raises out-migration because the unemployed search more than the employed, and reduces in-migration because of the 'crowding-out' effects of the job search of locally resident unemployed people"*. A third factor previously explained regards the impact of more affordable and higher quality transport infrastructure, in terms of time spending, quality of transportation; this will affect positively the commuting phenomenon as seen in several cases in the previous paragraph (see paragraph 3.3.1).

3.4.3 Determinants of Commuting: geographic reasons

Besides factors as socio-demographic and economic ones, proximity, distance, small and bigger agglomerations are only some of that aspects more related to the geographic sphere to be an important part in the process of commuting flows.

Distance is a fundamental ingredient in the study of commuting phenomenon: since the empirical gravity models to estimate the commuting flows from an origin region to a destination one are based on distance, labour size and employment, the importance to investigate possible reasons of influence over commuting due to distance is a fundamental and central step in the analysis. According to the findings of a study by Öhman and Lindgren (2003), distance has a negative effect on the commuting decisions; in fact increasing the distance between the origin region and the destination workplace decreases the numbers of commuters. Housing issue represents for the commuting flows another milestone influencing individuals about commuting for short and long distances instead of migrating temporarily or permanently to the working zone. According to several studies, many reasons contribute to boost commuting when it comes to the housing problem: in fact as indicated in the report *"Internal Labour Mobility in Central Europe and the Baltic Region"*, not affordable prices for houses at the working places decrease the levels of mobility of workers, which instead privilege commuting between different locations with more convenient housing offers (Liwinsky et all. 2007, p. 59). This situation as reported by the classical urban location theory ensures an equilibrium between housing conditions and wages: in fact to the jobs that require longer distances for workers to commute corresponds higher wages in order to attract the employees investing time and associated costs as transportation; in this case of equilibrium of perfect housing and labour market, the commuters will be compensated in two ways possible: *"either by higher wages or by lower rents"* (Frey et all, 2007, p. 3).

Another reason for commuting related to the geographic sphere might be seen in the contrast rural-urban areas, small villages versus big cities; according to several contributions by the academic world, this dualism thus represents one of the main point pushing flows of workers in moving to a different working place: following the findings proved by the study from Orazem et all. (2001), rural areas are more likely to be lacking of high income for individuals, low skills and low wages occupations, "forcing" then individuals from rural areas to search for higher wages and more suitable professions in metropolitan areas. Thus big cities and small locations should act as balancing relation for commuting flows, travelling from low income and employment poles directed to bigger agglomerations where opportunities might be more easily accessible.

3.4.4 Commuting and neighbourhood effect

In the present section it is presented the theory concerning the neighbourhood effect, which emphasizes the concept of the relations occurring between neighbouring regions belonging to different states.

The study promoted by Matha and Wintr regarding commuting flows tendency in the cross border regions of four European countries, Luxemburg, Belgium, Germany and France withdraw important conclusions: commuting flows tend to affect wages and unemployment levels, in the way that "*higher relative wages attract more in-commuters and higher relative unemployment rates lead to more out-commuters*" (Matha et all, 2009, p. 738). On a similar view another study offered by Hazans estimates the impact of commuting on wage disparities in different agglomerations, as capital cities, rural areas and countryside. The results of the investigation shed light on a reduction of disparities in terms of earnings gained in urban and rural areas, levelling the rank of wages with an increasing in the commuting flows tendency (Hazans, 2004). On the other hand, another researcher, Kertesi, states that high commuting costs create a barrier for the possible lowering of unemployment rate in local markets, widening disparities among high and low unemployment levels centres (2000).

At a national level, dissimilarities are found concerning economic performances to a general extend, and more specifically to the context involving unemployment and wage disparities: as emphasized by Overman and Puga (2002), in different European countries, the gap among areas might reach outstanding levels, like for instance the case of Italy and the division from North and South regarding in this case unemployment and disparities from region to region, measured in a difference of four times unemployment rates (2002, p. 119); however other European countries are as well related to the phenomenon of disparities among national borders areas. Focusing instead on a regional perspective, the concept of disparities in terms of unemployment and wages is integrated with the theory of state and neighbourhood effect: for the first one, a region is influenced by levels of unemployment and wages related to the levels of the State which the region belongs to; while the neighbourhood effect presumes that the unemployment rates and wages are influenced by the neighbouring region (Garcilazo et all, 2007). Contribution to the theory of the neighbouring effect is offered by a consistent literature review: Overman and Puga provide empirical results measuring that "*the unemployment rates of European regions are much closer to the rates of adjacent regions than to the average rate of other regions within the same EU country"* (Niebuhr, 2003, p. 19).

Garcilazo and Spiezia in the study concerning unemployment rates in Europe and North America, find significantly strong neighbouring effects among regions sharing borders: the authors conclude about evidences of regional disparities are explained by *"geographic location, or neighbouring effect, more than national factors, state effects"* (2007, p. 229). Finally Niebuhr confirms additionally with empirical results the findings of remarkable spill over effects among the neighbouring regions and their regional labour markets (2003).

3.4.5 Constraints to commuting flows

Possible constraints impeding daily working transfers have been identified by the academic world: as described in the Scientific Report on the Mobility of Cross-Border Workers in EU (2009), European countries face the issues of obstacles constituted by infrastructure barriers, low transport mobility services, different languages between regions, labour market restrictions, as well as tax and social security systems, besides for other more social and cultural differences that might represent additional barriers to workers mobility (2009, p. X).

Concentrating the attention on the Oresund region, these barriers can be evaluated and reported as present or absent obstacles influencing the Nordic area.

Regarding the barriers constituted by lack of infrastructures, with the construction of the Oresund Bridge the mobility of individuals and goods has been enhanced to high competitive levels, with low time consuming, good quality of services offered as train frequency (tendensoresund.org); besides the region is well covered with other transportation means, important poles of connections as international airports; thus lack of infrastructures might not represent the case of the Oresund region. Concerning barriers due to language differences, surveys from the Oresund Bridge Panel (Oresund Konsortiet), asked to Swedish commuters, reveal that these workers do not feel the language as an obstacle, but at the same time 88% of them have a good or very good Danish language level, pointing at this skill as a positive and important factor in working life (Oresund Konsortiet, 2009, p. 21).

Different discourse has to be highlighted for the obstacles consisting by labour market regulations, as taxations, pension system and welfare. Both the Oresund Konsortiet report and a study concerning the Nordic cross border region (Garlick et all. 2006), pinpoint important welfare state disparities between Sweden and Denmark, with the first being more present and supportive to its citizens; besides, other dissimilarities come from the taxation and pension systems, with different requirements and regulations, not being overcome or balanced between the two labour markets. These limitations might be considered as significant barriers for a more flexible and dynamic integration of the labour market. At last, cultural differences are not seen as a big challenge for the workers moving to Denmark (Oresund Konsortiet, 2009).

3.4.6 Commuting vs. migration

The report concerning "Cross-border workers within EU 27" (2009) gives some highlights about the argument: commuting is a phenomenon interesting million of individuals worldwide, travelling daily from a point to another, within short or long distances, with different transportation means. To some extend the decision of commuting does not have to deal with many decisional elements as new working/living environment as the process of migration includes.

The second phenomenon does not count as much as commuting in numbers of the labour force, due to the more complex issue involving physical movement, change of residence, new accommodation and further features. Besides migration might reoccur in an individual life few times, while commuting experiences might be a routine in a working life for some individuals.

CHAPTER 4
RESEARCH STRUCTURE AND HYPOTHESIS DEVELOPMENT

4.1 Research design

The aim of the analysis consists in a dual investigation regarding the commuting flows in the Oresund region; the research begins from the descriptive study of commuters characteristics, numerical impact and several other features, moving successively on the second focus of the main driving forces, embedded in labour market indicators, as employment, wage differences, and related to geographic aspects, as distance, population density.

4.1.1 Descriptive analysis

Due to a limitation of data concerning in particular social aspects, as marital status, or family composition, some variables are not taken into consideration for the descriptive analysis; however with the remaining ones a more concrete study will picture the commuting flows. The set of variables are here listed:

- number of out-commuting population by residence municipality, sex, workplace municipality and year (Swedish counties-Danish counties),
- Number of out commuting population by age,
- Number of out commuters for birth country origin divided in five classes, Denmark,

Sweden, European Union countries, Not EU countries, outside Europe,

- Number of out commuters by industry enterprises, size and sectors,
- Wages for out commuters by sex, residence municipality and industry.

Other descriptive trends will be taken into consideration in the analysis without including them in the assumptions list, as industry sectors and commuting phenomenon, birth countries for commuters and other features.

4.1.2 Limitations and clarifications regarding the descriptive analysis

- In/Out commuting individuals: according to the theory regarding migration flows (see paragraph 3.7) commuting flows relate to the prospective of the country from where persons commute to a neighbouring nation for the so-called push factor; in-commuting instead refers to the prospective from the country where individuals move to for the pull effect, in terms of higher wages and better life conditions: so in our specific cases, we modify partly the concept of out commuting taking as assumption that out commuting means Swedish commuters directed to Denmark, for an easier understanding of the terminology.
- The descriptive investigation will be performed, where possibly allowed by the data, at the regional level first, Scania and Zealand trends, and then at municipality levels, 33 municipality from Scania, and the main municipalities in Denmark, Copenhagen City, Frederiksberg, and the other counties forming the Danish region.
- No data on distances of commuters from Sweden to Denmark are offered in any existing database, however the limitation will be avoided performing GIS as described later on (see paragraph 4.2.3).

4.2 Driving forces analysis

To answer the research questions proposed in the previous paragraph, several assumptions are offered by the literature review and the theory related to commuting flows. The assumptions will be divided in two groups associated with labour indicators, geographic and demographic characteristics.

4.2.1 Economic and labour market factors

Reviewing the theoretical approach in the previous chapter, it has been specified that several factors might influence the process of commuting between the two regions. According to the literature, the list of the main factors are listed here:

- *Labour force in the origin region*
- *Employment in the destination region*
- *Wage differences between the two regions*
- *Unemployment between the two regions.*

Four assumptions have been developed regarding each of the factors related to labour market; 1° assumption: *labour force in the origin region works as pushing force for commuters; increased labour force corresponds to increased commuting flows.*

2° assumption: *employment from the destination region works as pulling force for commuters; increased employment corresponds to increased commuting flows.*

3° assumption: *wage differences are related to commuting flows; increased differences in wages from origin to destination regions corresponds to decrement in commuting flows.*

4° assumption: *unemployment works as pushing force for commuters; increased unemployment in the origin region corresponds to increased commuting flows.*

4.2.2 Geographic factors

The remaining factors possibly having influence on the commuting flows can be listed as follows:

- *Distance*
- *Housing prices*
- *Population density*
- *Urban vs. rural*

Four assumptions have been developed regarding each of the factors related to geographic aspects:

5° assumption: *increased distance corresponds to decreased commuting flows.*

6° assumption: *increased housing costs at the working place corresponds to an increment in commuting flows.*

7° assumption: *higher percentage of population density corresponds to lesser commuting flows.*

8° assumption: rural areas correspond to higher commuting flows amounts compared to urban ones. Finally another assumption will be analyzed which is more related to demographic factors;

9° assumption: *increased education levels correspond to increment in commuting flows.*

For answering the previous question, a list of variables is included in the analysis performed with the gravity model explained in the following paragraph; besides since it is useful to provide a complete and exhaustive understanding of the analysis, some attention needs to be focused on the terminology that will clarify several expressions systematically introduced in the present work and on specific requirements of the study.

- Employment: the log amount of individuals from 15 to 64 years old employed in the cities of Copenhagen and Frederiksberg, and in the Copenhagen County.
- Labour: the log amount of individuals in the labour force, from 16 to 64 years old, from the 33 municipalities in Scania.
- Distance: the log length in kilometres from the central part of each municipality in Scania to a central point in the Zealand region, distance average of the different locations in Denmark.
- Unemployment: the log difference of individuals unemployed between the origin region Scania and the above mentioned destination counties in Zealand.
- Wage difference: the log difference of the wages earned for each year between the origin region Scania and the above mentioned destination counties in Zealand.
- House Sweden: the log amount of average price for detached accommodation in the municipalities from Scania.
- House Denmark: the log amount of average price for detached accommodation in the destination locations in Zealand.
- Education: the share of the population which has achieved school education beyond the full time mandatory level (ISCED code 3-6).
- Population density: the share of population density from each municipality
- Train: the dummy variable indicating the presence or absence of train stations in the municipality of origin in Scania.
- City: the dummy variable including a city equal or superior of 35.000 inhabitants in the municipality of origin in Scania according to the year 2000 (source SCB).
- Medium: the dummy variable including a city between 15.000 and 34.999 inhabitants in the municipality of origin in Scania according to the year 2000 (source SCB)..
- Small: the dummy variable including a location up till 14.999 inhabitants in the municipality of origin in Scania according to the year 2000 (source SCB).
- Distance60: the dummy variable including commuters amount travelling from the municipalities in Scania to the working place in Zealand within a distance of 60

kilometres.

- Distance100: the dummy variable including commuters amount travelling from the municipalities in Scania to the working place in Zealand within a distance of 100 kilometres.
- Distance160: the dummy variable including commuters amount travelling from the municipalities in Scania to the working place in Zealand within a distance of 160 kilometres.

Furthermore it is useful to explain appropriately the terms in use for the analysis:

Municipality: the term is meant to indicate the geographic territoriality translated with the Swedish term "Kommun".

County: the term will be in use for defining the counties from the Danish side involved in the analysis; the classification of county differs from municipality due to a geographical larger territory compared to the first one, and the fact that municipalities form a county.

Commuters:

- individuals travelling daily from or to Sweden/Denmark to reach the working place different from their country of residence.
- Individuals must have gained their income from "work in the neighbouring country during the month of November of the current year"(Orestat database report, 2006: 3).
- Individuals earning an income from both country of residence and work, will be included in the analysis only exclusively if the country of residence income will be lower than the residence country income.
- Danish workers commuting to Sweden must have earned at least 10% of the price base salary in a year (in 2004 corresponds to 393.000 Sek) to be classified as commuters. Besides, Swedish labour laws consider eligible workers population over 16 years old.
- Swedish workers commuting to Denmark must have earned at least 8965 DKK over the total year income to be classified as commuters. Besides they must be over 15 years old.

Transportation means: in the analysis are included all the transportation means, public and private, that require the crossing of the Oresund Bridge. No interest in the ferry connections or other transportation means.

Distance calculation: the distance has been calculated with the programme ArcGIS 9.3 connecting the main city or village in the municipality of origin, in most of the times located approximately in the middle of the territory, to a manually chosen point in the Danish region, calculating the average distance between the closest Danish county from Scania, Copenhagen, and the farthest, Ledøje-Smørum. The software performs the distance analysis connecting the origin region to the destination one through the closest route possibly calculated.

4.3 Methodology

The analysis takes under scrutiny the municipalities from the Swedish region and the Danish municipalities in Zealand region. It is important to specify that counties where the commuting phenomenon does not appear or it is extremely low will not be analyzed in the interest of the study. Therefore the geographical delimitation of the study will deal with commuting patterns directed to Copenhagen City, and Copenhagen county, the main receivers in the Zealand region, from the Scania municipalities. The research will be divided in two parts: the first including the descriptive analysis of commuting from Sweden to Denmark from the years 1997 to 2005, regarding the Scania county selection; the second part will present two different methods to deal with commuting flows, normally used for the purpose of the analysis: the Negative Binomial regression, and the Generalized Negative regression, with focus on different variables listed in the following paragraph regarding social and economic factors, as well as labour market indicators.

4.4 Gravity Model estimation

The gravity model is a recognized tool by the academic world to calculate flows, in this case commuters flows, across the space. According to the theory (Matha, Markarov,2009:1), the standard gravity model implies that *"the number of people that live in region i and work in region j (i.e. the commuting flow Tij) increases in the size of labour force in the home region Li, the employment in the region of work Ej and decreases with the distance between the regions dij";* this statement can be summarized in the current form:

$$T_{ij} = cL_i^{\alpha} E_j^{\beta} f(d_{ij}, \gamma)$$

- T_{ij} = Commuting flows from region i (worker origin region) to region j (working destination)
- L_i = Labour force in the origin region
- E_j = Employment in working region
- D_{ij} = Distance from region i to region j
- c is a constant; α and are β parameters to be evaluated and f a function of distance.
- t = time period included in the analysis

As performed by previous researchers (Matha and Wintr), the basic gravity model is implemented with the values that are in need to be evaluated, wages, w, and unemployment u ,rewritten as follows:

$$T_{ijt} = c(u_{it}/u_{jt})(w_{it}/w_{jt}) L_{it}^{\alpha} E_{jt}^{\beta} f(d_{ijt}, \gamma).$$

Implementing the formula with the remaining variables and adding the logarithm and multiplicative error term , the regression equation can be obtained as follows:

$$\ln T_{ijt} = \alpha \ln(L_{it}) + \beta \ln(E_{jt}) + \gamma \ln(d_{ij}) + \delta \ln(u_{it}/u_{jt}) + \zeta \ln(w_{it}/w_{jt}) + \eta_1 \ln(HouS_{it}) + \eta_2 \ln(HouD_{jt}) + \eta_3 \ln(Edu_{it}) + \eta_4 \ln(Pop_{it}) + \eta_5 \ln(Tra_i) + \eta_6 \ln(Big_{it}) + \eta_7 \ln(Med_{it}) + \eta_8 \ln(Sma_{it}) + \eta_9 \ln(d60_{ij}) + \eta_{10} \ln(d100_{ij}) + \eta_{11} \ln(d160_{ij}) + \varepsilon_{ijt}.$$

Following the indications of previous studies, three methods have been commonly used for the estimation of the gravity model: ordinary least squares regression, negative binomial and generalized negative binomial regressions.

The first method, the ordinary least square regression, can be used to analyze the issue taking as assumption that the T_{ijt} is a normally distributed and continuous variable. However in the case of the present research, the amount of commuters represents a count variable, not assuming negative values and with a distribution skewed towards zero. As well as suggested by Marvakov and Matha (2007), the methods to estimate the gravity model are usually the negative binomial regression and the generalized one; thus these two will be part fundamental of the empirical analysis, with a different assumption compared to the first regression: since the variable T_{ijt} cannot assume negative values, it can be improved with the use of the other two methods, with the first one adapting a Poisson distribution. Regarding the negative binomial regression, a limitation of it needs to be underlined: as emphasized by different studies as "Commuting flows across bordering regions" (Matha et all. 2009), and "An analysis of regional commuting flows in the European Union", (Marvakov et all., 2007) the negative binomial regression supposes that the Poisson distribution explains the commuting flows with the mean being equal to the variance of the variable T*ijt*. As it will be later shown in the analysis, the case for the current dataset demonstrates a clear over dispersion, with for the example of the year 1999 with mean at 922 and the variance at 532 commuters. Thus the third method, the generalized negative binomial estimation works as resolution for the mentioned limitation, with an extra variation parameter added in the Poisson method. In the specific, the so called parameter assumes the value λ*ij*, that is equal to exp*(xijtβ + uijt),* where β represents the vector of parameters, *uijt* corresponds to the error term explaining the gamma distribution, (gamma= 1/α, α) and *xijt* representing the matrix of explanatory variables. All the process is needed to calculate the value α: greater is the value, greater is the over dispersion, that will be reduced by the generalized negative binomial estimation (Marvakov et all., 2007).

Scrutinizing the different methods adapted to analyze migration flows and in particular commuting ones, the gravity model appears as the most used and suitable one with the applications of the described methods.

4.5 Software applications

The statistical analysis will be performed with the technological support of software SPSS® version 17; for the visual representations as maps to describe the different phenomenon, ArcGIS® 9.3 programme will be part of the analysis. Finally Microsoft Excel® will be used for calculations and to represent patterns in the form of graphs.

4.5.1 Limitations and clarifications regarding the gravity model analysis

- In the present study, the influence of commuting time might be significant to determinate commuters choices and relations with time spent for travelling to the work spots: however no data concerning time are offered, besides nor commuter transportation share (numbers of commuters divided by the choice of transport means) lacks in the databases for the Oresund Region estimation. For this reason no evaluation of time commuting can be taken into analysis.
- As stated earlier, the reform of municipalities in Zealand has been officially initiated in 2007; since that the current analysis deals with a time lag from 1997 till 2005, the

municipalities taken under scrutiny are the ante-reform ones, differing in number and geographical extensions compared to the post-reform municipalities.

4.6 Data

The data are extrapolated from the Orestat database, a conjunction of the Swedish and Danish national databases, with special interest on the Oresund region. The data are carried on with yearly determination since 1997, for some variables since 1995, till the year 2005 for the majority of them, till year 2007 for the remaining variables.

The different observations include general information about population, geography, labour market, economic performance and further data related to the Oresund region, and more detailed variables focus on the commuting phenomenon. These explain commuters by gender and age, residence municipality and workplace destination, education levels, birth place, industry sectors for commuters, and total wages by sex, industry and workplace.

Besides further information are gathered with the consultancy of the Statistics Sweden Agency, SCB.se web site, and the Danish Statistics National Agency, dst.dk, with as well limited consultation of other international Statistics Database, as CIA World Fact and Euro stat.

4.7 Commuters sample

The characteristics required for individuals to be entitled as commuters for the current analysis have been clarified in the previous paragraphs; after this selection the amounts of individuals treated in the investigation vary from 1844 units of 1999, up to 7365 in the last year 2005. These commuters travel daily to reach locations spread between Copenhagen City and the remaining municipalities in Copenhagen County.

CHAPTER 5
RESULTS, DISCUSSION, CONCLUSIONS

5.1 Introduction

The purpose of this part is to present a general description of the phenomenon analyzing through the different characteristics listed in the previous chapters; successively the main factors will be taken into considerations to determine their incidence in influencing commuting flows, thanks to the gravity model estimation. Results and discussions will follow dividing them into two separated investigations, which can be defined as descriptive and factors analyses.

5.2 Commuting in Europe

Since its establishment, the European Community has given remarkable emphasis on the mobility of individuals as one of the main principles; labour mobility as well occupies the same importance level in the priorities of the Community, demonstrated by reforms boosting movements of individuals, lower standards barriers in labour markets and policies directed to a more effective integration between the Countries in terms of economic relations (Hemmer et all., 2009). However the current situation regarding labour mobility in Europe still lags behind compared to other confederations of States, as United States in the first place: as emphasized in the report “Expertise in labour mobility”, in Europe the levels are remarkably low, with 1.5% of EU 25 labour force population, corresponding to 3.3 million on a total population of 224 million circa, which live and work in another UE member state in the year 2005 (www.Labourmobility.com).

The levels for the USA regarding individuals living and working in another State are estimated to reach the share of 17% yearly, circa 8.1 million out of a total labour force population (www. Cia.gov). Regarding commuting patterns across the different European countries, the latest decade has experience an important increase in numbers of individuals daily travelling to reach the workplace in a foreign country: in fact from the year 2000 to the year 2007, the amount of commuters has increased over 44.6% in the EU 15/EFTA/EEA[1] countries, moving from 490.000 units to 660.000 individuals. However taking these amounts in comparison with total labour force in the European countries, the percentage is estimated at circa 0.34% (www.Cia.gov).

5.2.1 Commuting in Sweden

As emphasized by different authors commuting is a phenomenon interesting mainly western countries around the world, and Sweden as well follows the same directions taken during the years by the Occidental society. In fact as stated by Ohman and Lindgren, since the 70’s the movements of daily workers has experienced a constant increase in both numbers of individuals, as well as in kilometres travelled to reach the working destination (2007). Finally focusing the attention on the following table n.2, showing the commuters amounts travelling daily from a municipality to another, the results demonstrate as well how remarkable the increase of commuters has appeared in the period between the 90's and 2000's: an average of 38% increment of workers daily travelling from their residence county to another one for working underlines the effective weight of the commuting incidence in the labour market of the Country.

[1] European Union and European Free Trade Association (Iceland, Liechtenstein, Norway).

Table 2 Gainfully employed 16+ years commuters, leaving the county by region and period. Data from Statistics Sweden database.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Increment (%)
Stockholm county	19914	21511	21767	22357	21251	22982	24609	26583	25932	27707	27420	37
Uppsala county	23701	24392	25320	26267	25945	28446	30108	31944	32199	32417	31419	32,5
Södermanland county	13195	13414	13808	14383	14290	15826	16376	17549	18207	19316	19117	44,8
Östergötland county	7432	7796	7831	8362	8295	9342	9988	10441	10802	10891	10651	43,4
Jönköping county	6033	6443	6447	6901	6443	7164	7904	7706	7715	7860	7657	26,9
Kronoberg county	4624	4918	5118	5305	5090	5863	5803	6141	5990	6049	5885	27,2
Kalmar county	4689	4904	5258	5579	5068	6102	6218	6279	6292	6618	6552	39,7
Gotland county	1241	1244	1261	1451	1435	1492	1582	1524	1602	1837	1659	33,6
Blekinge county	3946	4131	4490	4695	4668	5078	5424	5944	6125	6221	6074	53,9
Scania county	16711	17471	17673	18089	18282	19903	21199	23032	22922	23495	23522	40,7
Halland county	20806	21931	22748	23278	23100	24932	25143	25903	26041	26501	26330	26,5
Västra Götaland county	20272	21913	22761	24016	23519	24853	26111	27756	27170	28034	27325	34,7
Värmland county	4689	4853	5077	5461	5105	6112	6396	6790	7109	6903	6768	44,3
Örebro county	5402	5679	5838	6151	6077	6592	7231	7189	7487	7964	7692	42,3
Västmanland county	8337	8660	8850	8834	9180	10418	11255	12100	12353	12863	12814	53,7
Dalarna county	4923	5433	5640	5704	5416	6301	6807	7272	7220	7322	6828	38,6
Gävleborg county	4890	5302	5402	5649	5611	6326	6780	7187	7562	8052	7765	58,7
Västernorrland county	3409	3733	3892	4098	3960	4516	4656	5067	5111	5078	4777	40,1
Jämtland county	2197	2335	2444	2850	2456	2881	3366	3443	3249	3161	3070	39,7
Västerbotten county	3375	3535	3695	3733	3677	4229	4557	4865	5031	4979	4807	42,4
Norrbotten county	2347	2614	2675	2797	2618	3321	3508	3725	3809	3909	3743	54,4
												Tot. average %
												38

5.3 Descriptive analysis: Commuting flows in the Oresund region, from Scania to Denmark and vice versa

According to the report TendensOresund, in the month of November, year 2007, the record of number of commuters travelling from Sweden to Denmark has been achieved, reaching the peak of 17 100 persons commuting daily in the Oresund Region. Of this important amount, almost 90%, translated in 15 300 individuals circa, travel across the Oresund Bridge. The current analysis will not deal with the different percentage of commuters choosing of travelling across the Bridge or with other means that do not require the crossing, however this statement once again is used to remark the significant impact and fundamental tool for commuters that the Bridge represents. The numbers presented in the study in fact will reflect aggregate amounts of individuals both travelling across the Bridge and with other means of transportation, however as stated in the TendensOresund report, since the year 2000, the almost totality of commuting flows were served by car and train transportation over the Oresund Bridge.

The majority of commuting flows shows the mentioned tendency of a massive movement of daily workers from the Swedish side directed to the Danish region. The years before the construction of the Bridge, 1997 to 1999, indicate a slight increase in numbers of commuters, stabilizing the amount of daily travellers in 2200 units circa, travelling exclusively with ferry connections. The year 2000, date of the Bridge opening to public, follows the slow increase trend of the previous time lag, even explained by the fact that the public and private transportation have been allowed from the month of July the 1st, official date of the Oresund Bridge aperture. The following years instead prove the important contribution of the Infrastructure to the mobility of workers in the Region: from the 2001, with almost doubled amount of commuters respect to the year 2000, till 2005, the number of travellers increases from 3800 units circa to almost 9000, + 136 % in a time gap of only four years. Finally the years 2006 and 2007 demonstrate a similar boost with higher units registered, calculated in almost 18000 daily travellers across the Oresund Region, an increase of circa 800% in a time lag of 10 years.

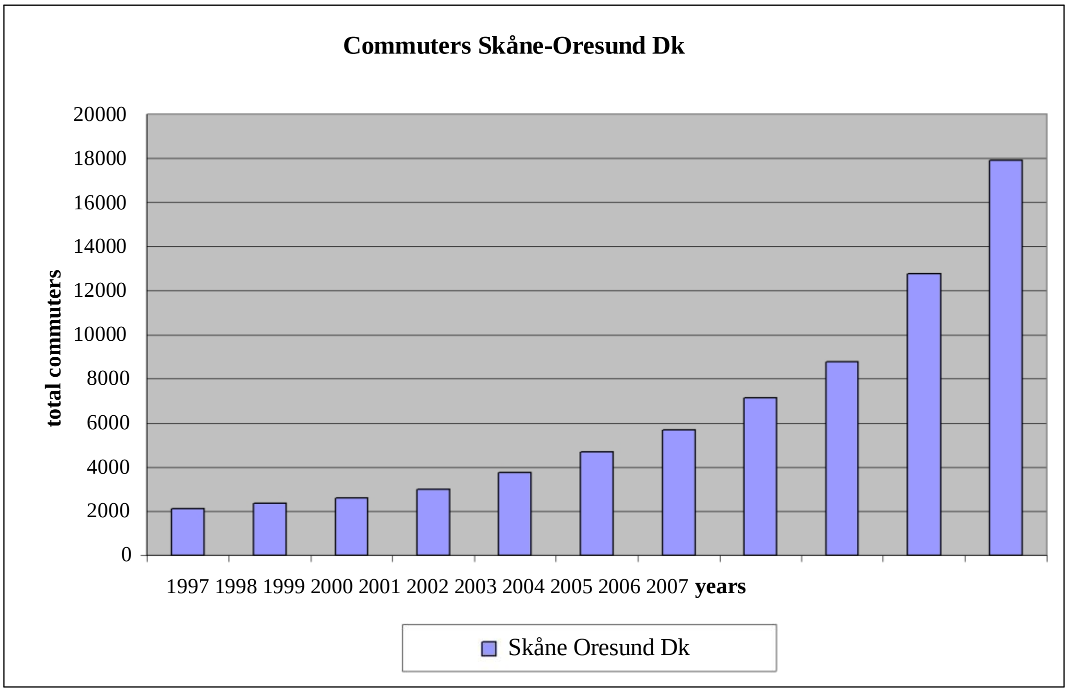


Figure 11. Commuters from Scania to Zealand region, Denmark. Data from Orestat database.

The inverse movement of commuters from the Danish side to Scania region reflects a remarkably lower tendency compared to the one seen previously, and furthermore the distribution over the years follows a more uneven tendency in relation to the Scania trends: after a slight increase in the years before the Oresund Bridge opening, from the year 2000 a steep raise with an approximately + 50% of units recorded proves the positive contribution of the Infrastructure in boosting mobility of workers. The following years underline the growing tendency of commuters from the Danish side to the Swedish one, however with some differences: while the year 2001 has witnessed a sharp increase jumping from the 300 units circa of the previous year to the 550 individuals, about + 83%, the upcoming years 2002 and 2003 present a slight decrease, with a positive raise in 2004, + 34% of commuters compared to the previous year, continuing the increasing in the year 2005-2006, and finally decreasing in the year 2007 to 620 units circa (- 16% compared to 2006).

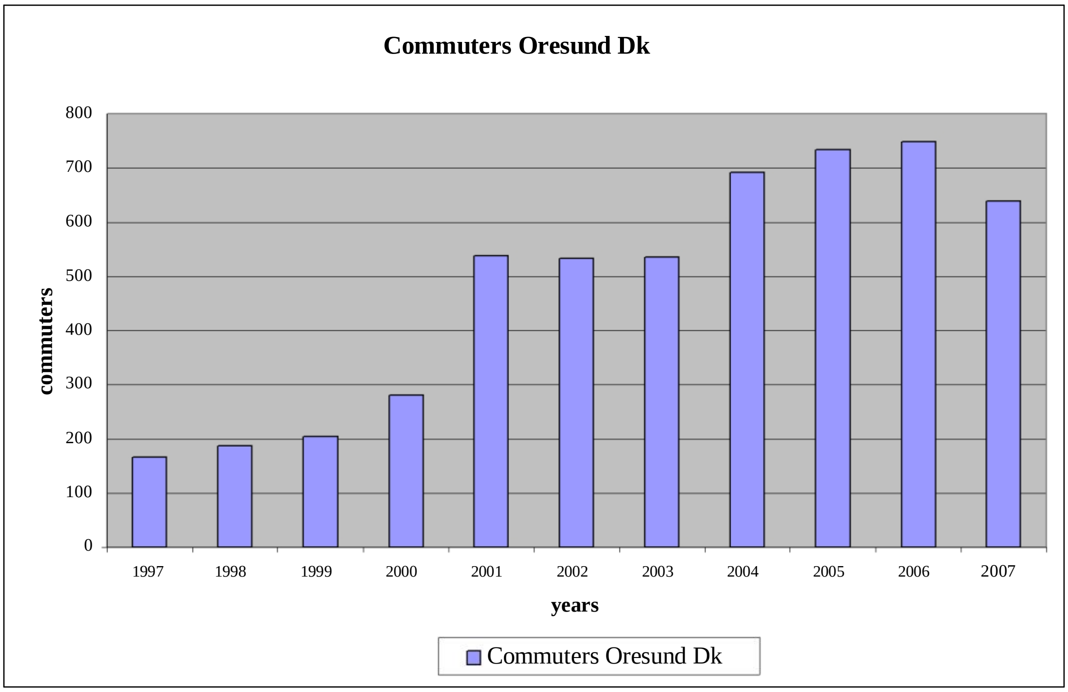


Figure 12. Commuters from Zealand, Danish region, to Scania. Data from Orestat database.

The movements of commuters from Scania region directed to Denmark can be grouped in South, North East and North West of the Swedish region, to be successively taken more specifically regarding each municipality from the Scania region. In the current database South Scania is composed by different municipalities, with the most remarkable cities as Malmo, Lund, Trelleborg, for population, labour force amount. North East Scania comprises five different municipalities, Hässleholm and Kristianstad as main ones.

North West of Scania groups municipalities as Landskrona, Helsingborg, important centres in the regional context for population size.

The two schemes below highlight the population share and the labour force levels, inhabitants in the legal age for working, in the Scania Area: the South part of the region reaches high percentage in both the fields, counting for almost 60 of the total amount, followed by the North West area and finally the North East part.

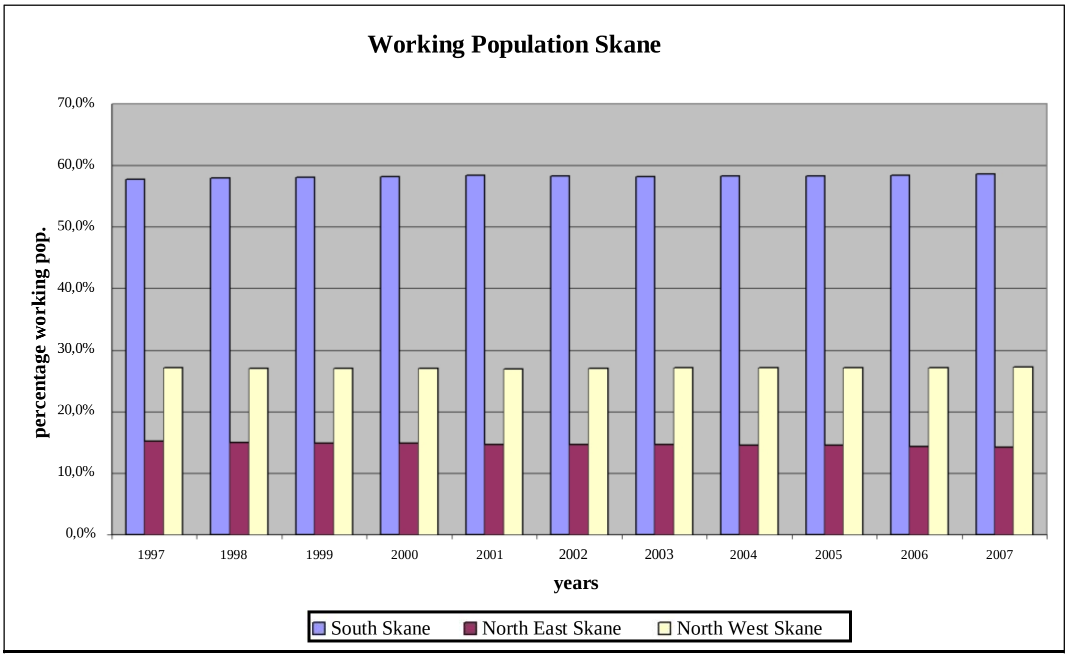


Figure 13. Working population in South, North West and North East Scania. Data from Orestat database.

The scheme below illustrates the contribution of the different areas in supplying commuters to the Danish part: the years 1997-1999 do not present remarkable distinctions among the South and North West areas, thanks to a relative proximity to the Danish side, and similar population distribution; the North East area instead, for lower population density and an undoubted distance to Denmark, shows little involvements of commuters.

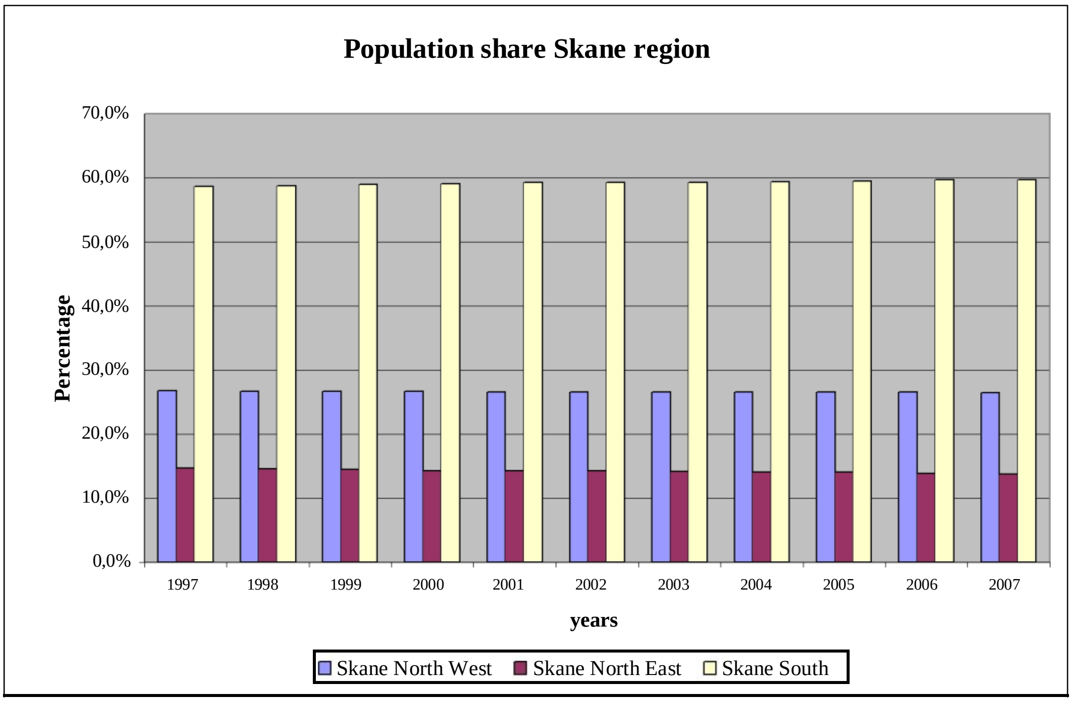


Figure 14. Population share divided in South, North West and North East Scania. Data from Orestat database.

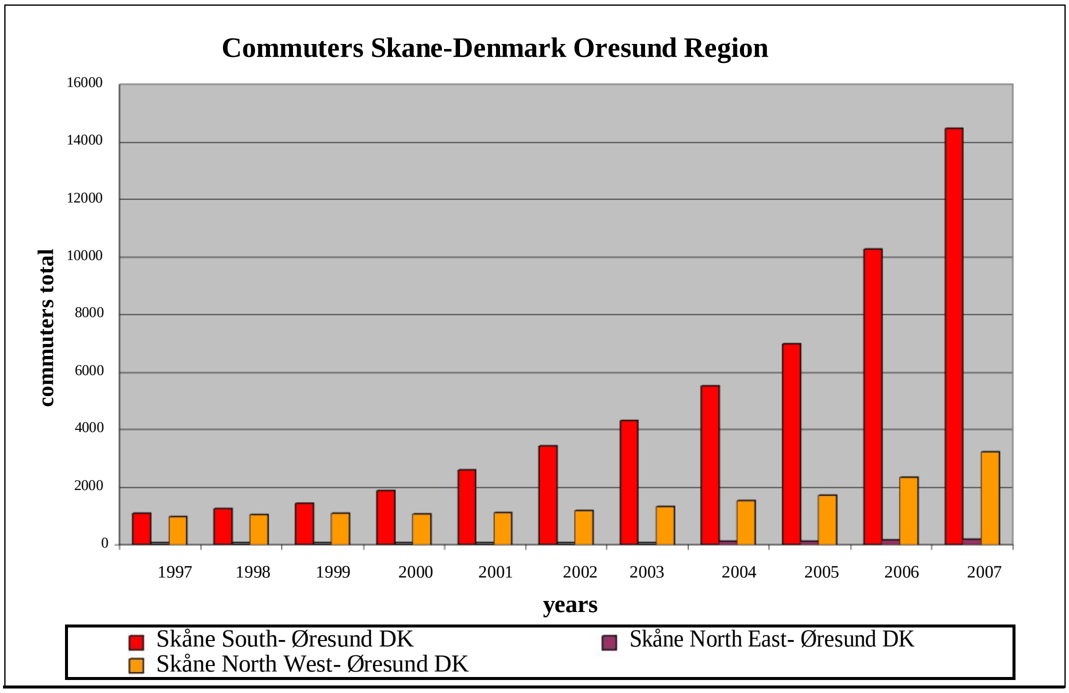


Figure 15. Commuters from South, North West and North East Scania to Zealand, Denmark. Data from Orestat database.

From the South Scania prospective, firstly it is experienced a certain balance of movements with North West Scania before the introduction of the Bridge; however the boost starts to appear from the year 2001, doubling circa the amount of commuters from the year 1997, and keeping a continuous and remarked increase during the period with a final peak in the year 2007 of 14474, +672 of commuting movements compared to the 1873 units of 2000.

Same approach will be developed as follows concerning the flows of commuters from Denmark directed to Scania, from a more localized analysis including different zones from Zealand, the Danish region in the Oresund area: Copenhagen and Frederiksborg Cities, Copenhagen, Frederiksborg, Roskilde, West Zealand, Storstroms and Bornholm counties, as the Danish region has been divided in administrative zones before the introduction of the 2007 new municipalities division. As seen in the graph below, the main contribution of labour force commuting to Scania comes from Copenhagen City, population 509.861 inhabitants and 282.680 workers (2007); the Capital City shows during all the time lag a continuous increase slowed down only in the year 2007. The second main commuters supplier is represented by Frederiksborg county, lagging behind compared to Copenhagen City in terms of numbers: in the years from 2004 till 2006, the difference between the Capital City and Frederiksborg county is measured in the double of individuals commuting from the first compared to the second zone.

Finally Copenhagen county follows relatively close to the levels achieved by Frederiksborg county.

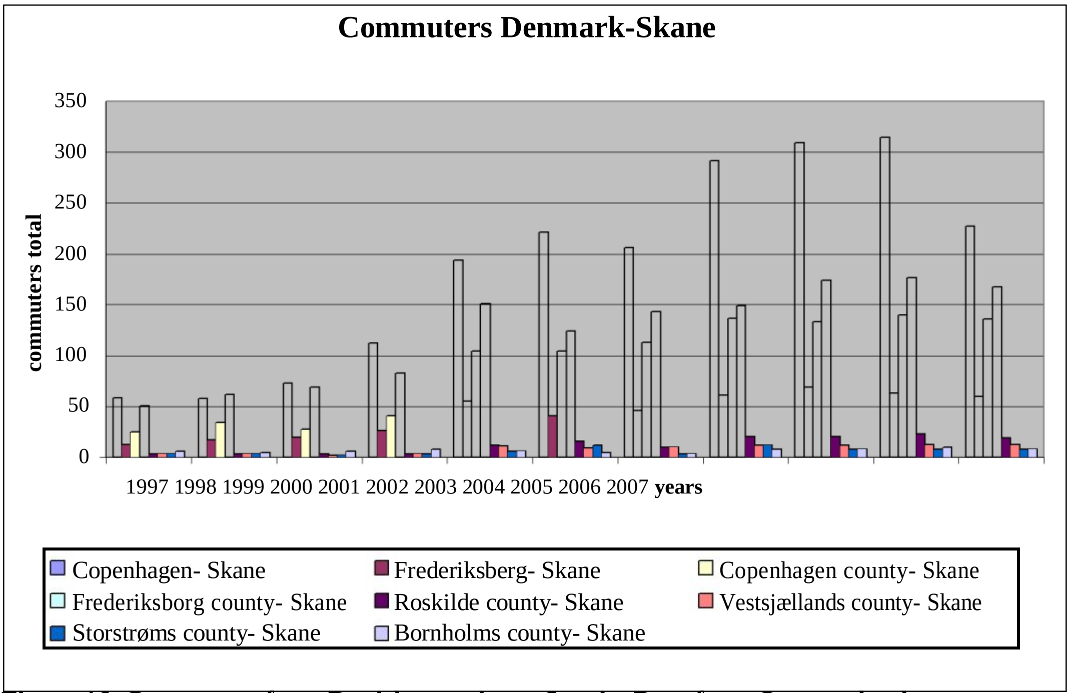


Figure 16. Commuters from Danish counties to Scania. Data from Orestat database.

After having approached the commuting phenomenon to a larger extend, the analysis will shed light on the main centres from Scania involved more remarkably; first step to take relates to the distribution of working forces among the communities in Scania region, in order to have a clear picture of the geographical agglomeration areas, in terms of population and working force contribution. The table 3 below presents the percentage of individuals in the legal age for occupations distributed among the several cities in the Swedish region: Malmo leads the rank with 23% circa of working force during the time lag, followed by Helsingborg, 10%, Lund 8.8%, Kristianstad and Hässleholm, respectively with 6.4% and 4.1%. The rest of the municipalities represents lower levels compared to the mentioned areas, with percentage oscillating from 3.5 % to 0.6 %.

Table 3. Percentage of working population Scania region per municipality (%). Data from Orestat database.

Municipalities	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Malmö	22,99	23,20	23,36	23,44	23,54	23,63	23,64	23,62	23,63	23,73	23,78
Helsingborg	10,47	10,50	10,51	10,53	10,53	10,52	10,50	10,51	10,50	10,48	10,48
Lund	8,86	8,87	8,88	8,91	8,92	8,93	8,93	8,89	8,90	8,86	8,91
Kristianstad	6,59	6,58	6,56	6,56	6,54	6,53	6,51	6,50	6,49	6,46	6,45
Hässleholm	4,38	4,35	4,31	4,26	4,24	4,21	4,21	4,20	4,19	4,17	4,16
Landskrona	3,38	3,37	3,36	3,37	3,39	3,38	3,37	3,38	3,38	3,40	3,39
Trelleborg	3,37	3,37	3,37	3,38	3,37	3,36	3,36	3,38	3,39	3,38	3,40
Ängelholm	3,26	3,27	3,28	3,29	3,30	3,29	3,28	3,29	3,28	3,28	3,24
Vellinge	2,58	2,60	2,60	2,60	2,61	2,61	2,61	2,61	2,60	2,61	2,60
Eslöv	2,49	2,46	2,45	2,46	2,46	2,46	2,49	2,50	2,51	2,51	2,51
Ystad	2,35	2,37	2,38	2,36	2,36	2,35	2,36	2,37	2,37	2,37	2,37
Kävlinge	2,08	2,08	2,08	2,10	2,11	2,11	2,12	2,15	2,18	2,21	2,20
Höganäs	2,04	2,02	2,01	2,00	1,99	1,98	1,98	1,98	1,98	1,99	1,99
Simrishamn	1,79	1,78	1,75	1,73	1,73	1,72	1,72	1,72	1,71	1,69	1,66
Staffanstorp	1,65	1,65	1,66	1,67	1,67	1,66	1,66	1,66	1,67	1,67	1,68
Lomma	1,55	1,53	1,54	1,55	1,54	1,53	1,53	1,53	1,53	1,56	1,58
Svedala	1,52	1,53	1,52	1,52	1,51	1,52	1,51	1,53	1,53	1,53	1,52
Sjöbo	1,45	1,46	1,45	1,45	1,46	1,47	1,48	1,49	1,49	1,49	1,50
Klippan	1,44	1,41	1,39	1,37	1,36	1,37	1,38	1,37	1,37	1,36	1,35
Båstad	1,29	1,28	1,28	1,27	1,26	1,25	1,25	1,24	1,23	1,30	1,30
Östra Göinge	1,28	1,26	1,24	1,23	1,21	1,20	1,19	1,18	1,18	1,23	1,22
Burlöv	1,28	1,27	1,28	1,31	1,31	1,31	1,29	1,29	1,29	1,23	1,22
Bjuv	1,22	1,20	1,19	1,18	1,17	1,16	1,17	1,16	1,16	1,22	1,22
Hörby	1,21	1,21	1,21	1,20	1,20	1,21	1,21	1,22	1,22	1,21	1,20
Skurup	1,20	1,18	1,19	1,19	1,19	1,19	1,19	1,19	1,20	1,16	1,15
Höör	1,19	1,19	1,19	1,20	1,20	1,20	1,21	1,22	1,22	1,16	1,17
Osby	1,18	1,16	1,15	1,13	1,12	1,10	1,10	1,09	1,08	1,13	1,14
Åstorp	1,13	1,12	1,10	1,10	1,10	1,11	1,12	1,11	1,11	1,09	1,08
Tomelilla	1,13	1,12	1,11	1,10	1,10	1,09	1,09	1,09	1,10	1,07	1,07
Svalöv	1,11	1,10	1,09	1,07	1,07	1,07	1,07	1,08	1,08	1,07	1,05
Bromölla	1,08	1,08	1,08	1,07	1,05	1,05	1,04	1,04	1,03	1,02	1,02
Örkelljunga	0,84	0,83	0,83	0,83	0,82	0,81	0,82	0,81	0,81	0,81	0,81
Perstorp	0,62	0,61	0,60	0,59	0,58	0,59	0,59	0,59	0,58	0,58	0,58
Tot.Working Pop. (amounts)	899072	902168	905537	911108	918208	926934	934840	944115	953867	968648	983059

The second step relates to the distribution of commuters working in Denmark from the different municipalities in Scania, with the map n.1 showing graphically the amounts of commuters collected in the table 4: as it can be predicted, Malmo, third city in Sweden for population, occupies the first position for numbers of commuters, followed by Helsingborg, second biggest city in Scania, positioned on the north west coast, Lund, third city in Scania, Vellinge, Landskrona and Trelleborg. However it is interesting to analyse the evolution over the ten years of the different municipalities affected in dissimilar ways by the introduction of the Bridge, with particular focus on these top six centres for commuters totality.

In the year 1997, Helsingborg and Malmo shared circa the same quantity of individuals commuting daily to Denmark, 627 and 744 respectively, counting for 29.4 and 34.9 % of the total commuters from Scania, with a working population of 94.000 and 220.000 circa for the two cities. Nevertheless the following years illustrate the opposing trends happening after the Bridge opening for the two major cities: from the year 2000, a continuous increase of commuters affect the labour force from Malmo, growing from 1304 units, 43.3 % of total movements in the entire Region, to 4042 units in 2004, 56.6 % of regional commuters, to reach the outstanding result of 10668 individuals, corresponding to the 59.6 %. An increase of +1337% in terms of comparison from the year 1997 to 2007 explains how significant and favourable impact of the Bridge has meant and still does nowadays for the commuters from Malmo city to the Danish side. A less remarkable trend has characterized instead the city of Helsingborg: from an almost similar quantity of commuters respect to Malmo in 1997, a slight increase over the years has reached the amount of 1725 units in 2007, an increment of 89%; it is important to underline that Helsingborg has direct connections with the Danish side by ferry transportation, however undoubtedly the opening of the Bridge has boosted commuting flows across it, as seen in the increase since the year 2000.

Lund has benefited as well for the new Infrastructure, since that from the year 1997, with 92 commuters, the amount of units has registered an increase almost ten times superior, 820 units in the year 2007, compared to the first year under analysis: + 791% of commuters in ten years.

Vellinge has experienced similar increasing levels of individuals travelling for occupations in Denmark: since the year 1997, with a concentrated number of commuters, 72, the increase has appeared consistent during the years, till reaching the peak of 583 workers in 2007, an increment of 710%.

Landskrona is situated on the west coast of Scania and has been affected during the years as well by a permanent and significant growth of commuters, more remarkably since the year 2001. In fact 1997 levels showed an amount of 110 commuters, decreased in the following years to 102 (2000) to finally increase to exponential peaks measured in 526 individuals in 2007, a + 378% of commuters in ten years time lag.

Table 4 Commuters by Municipality, amount and percentage share in Scania. Data from Orestat database.

Municipalities	1997	1997%	1998	1998%	1999	1999%	2000	2000%	2001	2001%	2002	2002%	2003	2003%	2004	2004%	2005	2005%	2006	2006%	2007	2007%
Malmö	744	34,9	877	37,1	973	37,7	1304	43,3	1820	48,5	2453	52,2	3142	55,3	4042	56,5	5124	58,3	7680	60,3	10668	59,6
Helsingborg	627	29,4	670	28,3	685	26,5	660	21,9	622	16,6	657	14,0	672	11,8	789	11,0	888	10,1	1212	9,5	1725	9,6
Landskrona	110	5,2	112	4,7	102	3,9	95	3,2	109	2,9	139	3,0	209	3,7	242	3,4	260	3,0	405	3,2	526	2,9
Lund	96	4,5	107	4,5	115	4,5	144	4,8	182	4,9	220	4,7	228	4,0	305	4,3	378	4,3	522	4,1	820	4,6
Vellinge	72	3,4	73	3,1	101	3,9	128	4,3	169	4,5	207	4,4	244	4,3	278	3,9	331	3,8	427	3,4	583	3,3
Åstorp	51	2,4	52	2,2	50	1,9	57	1,9	66	1,8	68	1,4	57	1,0	63	0,9	86	1,0	115	0,9	141	0,8
Ängelholm	38	1,8	46	1,9	68	2,6	79	2,6	77	2,1	69	1,5	66	1,2	61	0,9	76	0,9	84	0,7	112	0,6
Höganäs	37	1,7	45	1,9	55	2,1	51	1,7	51	1,4	44	0,9	53	0,9	61	0,9	61	0,7	76	0,6	98	0,5
Bjuv	35	1,6	39	1,6	40	1,5	46	1,5	58	1,5	66	1,4	73	1,3	92	1,3	104	1,2	150	1,2	207	1,2
Hässleholm	30	1,4	36	1,5	24	0,9	23	0,8	21	0,6	36	0,8	34	0,6	57	0,8	65	0,7	67	0,5	94	0,5
Klippan	26	1,2	30	1,3	30	1,2	25	0,8	36	1,0	48	1,0	63	1,1	84	1,2	78	0,9	114	0,9	160	0,9
Svalöv	24	1,1	18	0,8	22	0,9	17	0,6	23	0,6	29	0,6	33	0,6	37	0,5	57	0,6	67	0,5	103	0,6
Burlöv	24	1,1	29	1,2	27	1,0	38	1,3	50	1,3	69	1,5	78	1,4	101	1,4	119	1,4	193	1,5	271	1,5
Staffanstorp	23	1,1	25	1,1	26	1,0	27	0,9	39	1,0	54	1,1	65	1,1	78	1,1	84	1,0	117	0,9	190	1,1
Kristianstad	22	1,0	28	1,2	29	1,1	27	0,9	24	0,6	15	0,3	16	0,3	25	0,3	33	0,4	56	0,4	61	0,3
Kävlinge	18	0,8	17	0,7	24	0,9	27	0,9	29	0,8	39	0,8	46	0,8	50	0,7	74	0,8	97	0,8	162	0,9
Örkelljunga	17	0,8	19	0,8	25	1,0	26	0,9	36	1,0	35	0,7	50	0,9	58	0,8	58	0,7	60	0,5	86	0,5
Svedala	16	0,8	18	0,8	23	0,9	26	0,9	36	1,0	48	1,0	59	1,0	82	1,1	102	1,2	174	1,4	249	1,4
Trelleborg	15	0,7	22	0,9	26	1,0	38	1,3	57	1,5	83	1,8	123	2,2	162	2,3	215	2,4	314	2,5	473	2,6
Skurup	13	0,6	17	0,7	20	0,8	22	0,7	41	1,1	50	1,1	66	1,2	83	1,2	98	1,1	147	1,2	225	1,3
Ystad	12	0,6	10	0,4	16	0,6	20	0,7	31	0,8	32	0,7	36	0,6	41	0,6	52	0,6	67	0,5	126	0,7
Simrishamn	12	0,6	13	0,5	14	0,5	12	0,4	11	0,3	9	0,2	10	0,2	14	0,2	20	0,2	27	0,2	33	0,2
Lomma	11	0,5	12	0,5	22	0,9	28	0,9	37	1,0	48	1,0	51	0,9	61	0,9	69	0,8	88	0,7	133	0,7
Höör	9	0,4	6	0,3	10	0,4	13	0,4	18	0,5	33	0,7	45	0,8	66	0,9	76	0,9	99	0,8	134	0,7
Osby	9	0,4	6	0,3	8	0,3	8	0,3	8	0,2	14	0,3	10	0,2	9	0,1	7	0,1	7	0,1	8	0,0
Eslöv	8	0,4	9	0,4	13	0,5	19	0,6	29	0,8	38	0,8	38	0,7	52	0,7	74	0,8	121	0,9	170	1,0
Sjöbo	7	0,3	9	0,4	10	0,4	15	0,5	28	0,7	38	0,8	51	0,9	70	1,0	86	1,0	115	0,9	134	0,7
Båstad	7	0,3	5	0,2	9	0,3	13	0,4	14	0,4	10	0,2	10	0,2	14	0,2	13	0,1	19	0,1	30	0,2
Östra Göinge	6	0,3	6	0,3	4	0,2	5	0,2	5	0,1	7	0,1	7	0,1	12	0,2	11	0,1	15	0,1	16	0,1
Perstorp	5	0,2	3	0,1	5	0,2	5	0,2	11	0,3	15	0,3	22	0,4	25	0,3	28	0,3	28	0,2	43	0,2
Hörby	3	0,1	4	0,2	4	0,2	9	0,3	7	0,2	15	0,3	21	0,4	40	0,6	45	0,5	59	0,5	80	0,4
Tomelilla	2	0,1	1	0,0	3	0,1	3	0,1	6	0,2	7	0,1	5	0,1	5	0,1	11	0,1	20	0,2	23	0,1
Bromölla	1	0,0	1	0,0	1	0,0	0	0,0	0	0,0	2	0,0	0	0,0	1	0,0	0	0,0	2	0,0	6	0,0

Table 5: Top Six Cities for commuting flows-Scania. Data from Orestat database.

Municipality\ years	1997	2007	+ %
Trelleborg	15	473	3053
Malmo	744	10668	1337
Lund	92	820	791
Vellinge	72	583	710
Landskrona	110	526	378
Helsingborg	627	1725	89

Finally the municipality of Trelleborg concludes the paragraph concerning the first six areas for commuters flows: from a low amount of commuters, measured in 15 units in the year 1997, an exceptional trend of increase has reached in the year 2007 the number of 473 commuters, counting for a + 3053%.

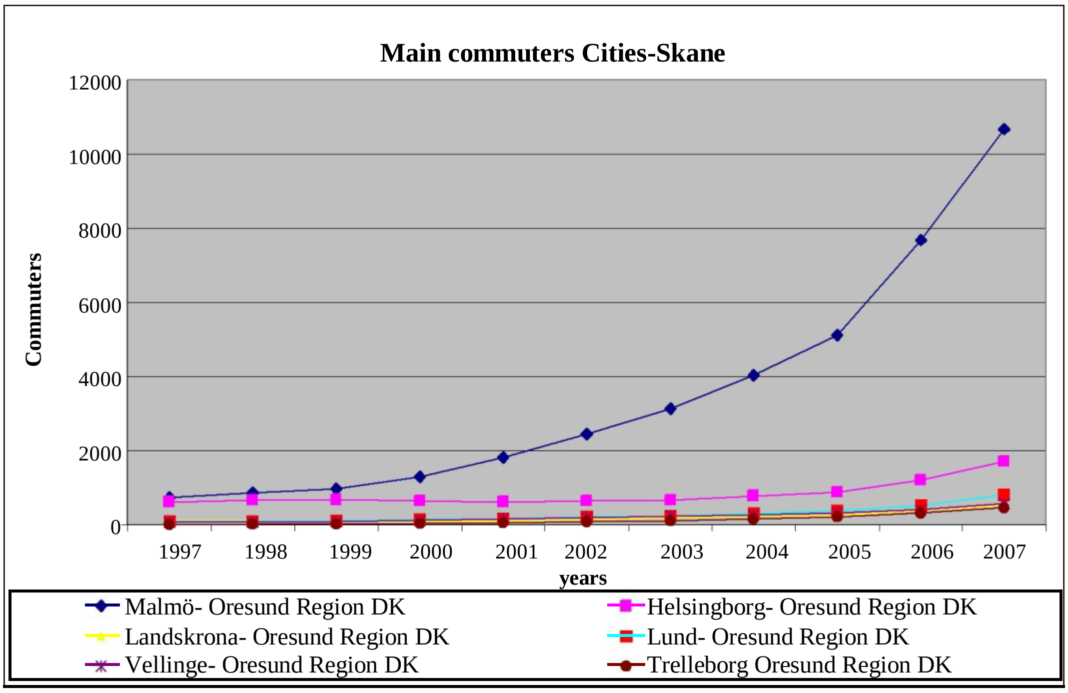


Figure 17. Main centres for commuters offer in Scania. Data from Orestat database.

5.3.1 Main commuters receivers in Denmark

The present section sheds light on the phenomenon of receiving commuters, in the specific case of the Danish market.It is furthermore fundamental to remind that since the study investigates through the period 1997-2007, the same denomination for the counties pre-administrative municipality reform will be kept to propose a clear analysis, even if from the year 2007 several municipalities have been merged in larger ones; however this change will not affect in any way the results of the analysis, since the new municipalities data have been translated in the old counties distribution. Copenhagen City, with levels of commuters demand touching the peak of 8000 units in year 2007, has been through a increasing process of attraction for individuals seeking for occupation in the Danish Capital, consisting of an increase of 2000 units per year since 2004. Before the introduction of the Bridge, the levels of commuting were approximately following a stable trend. Copenhagen County follows the Capital City as second major demand spot for commuters: similar trend to Copenhagen can be evaluated in the County as well, with a significant increase since the first year of the Bridge, with more remarked raise of commuters in the years 2006 and 2007; Frederiksborg County occupies the third place in the rank of commuters preferences, 1/3 of amount compared to Copenhagen City and more than half in comparison with Copenhagen county: the significant increase has appeared starting totally from the year 2006, doubling from the levels of 2005; before that no particular increment since 1997 has been registered. Frederiksberg City, and the rest of the counties, Roskilde, eleven municipalities, Bornholm, five, Storstroms, twenty-four and West Zealand, 25 municipalities, do not present outstanding results, but a general similarity in terms of commuters presence; as emphasized before, these low levels of commuting flows are the reason why the latest municipalities will not be taken into the analysis of individuals travelling to these spots for working.

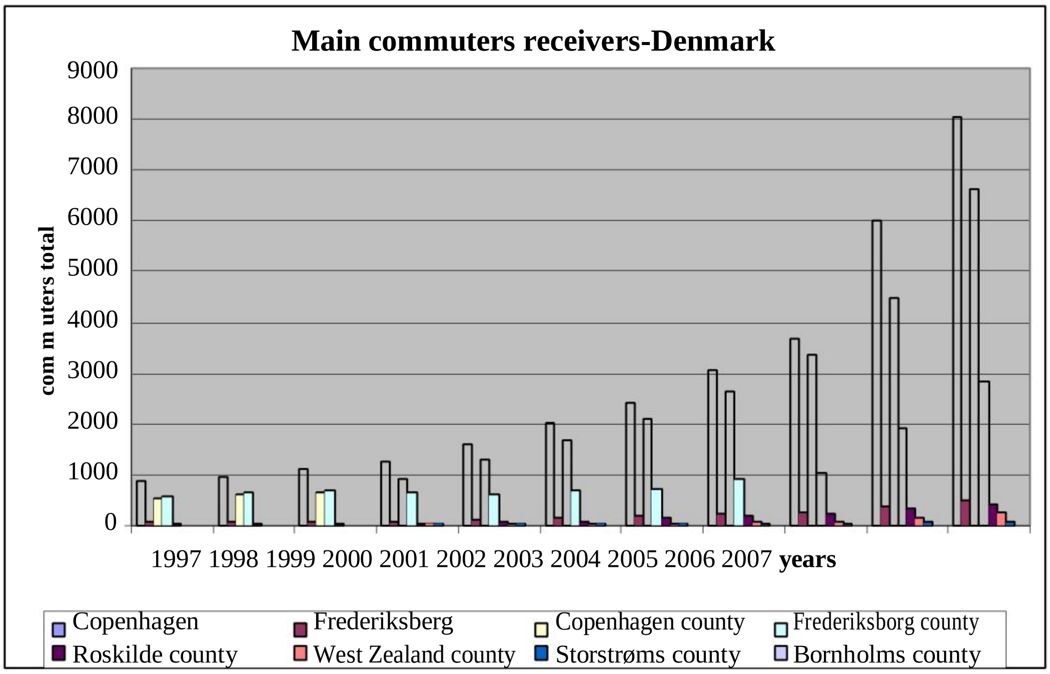
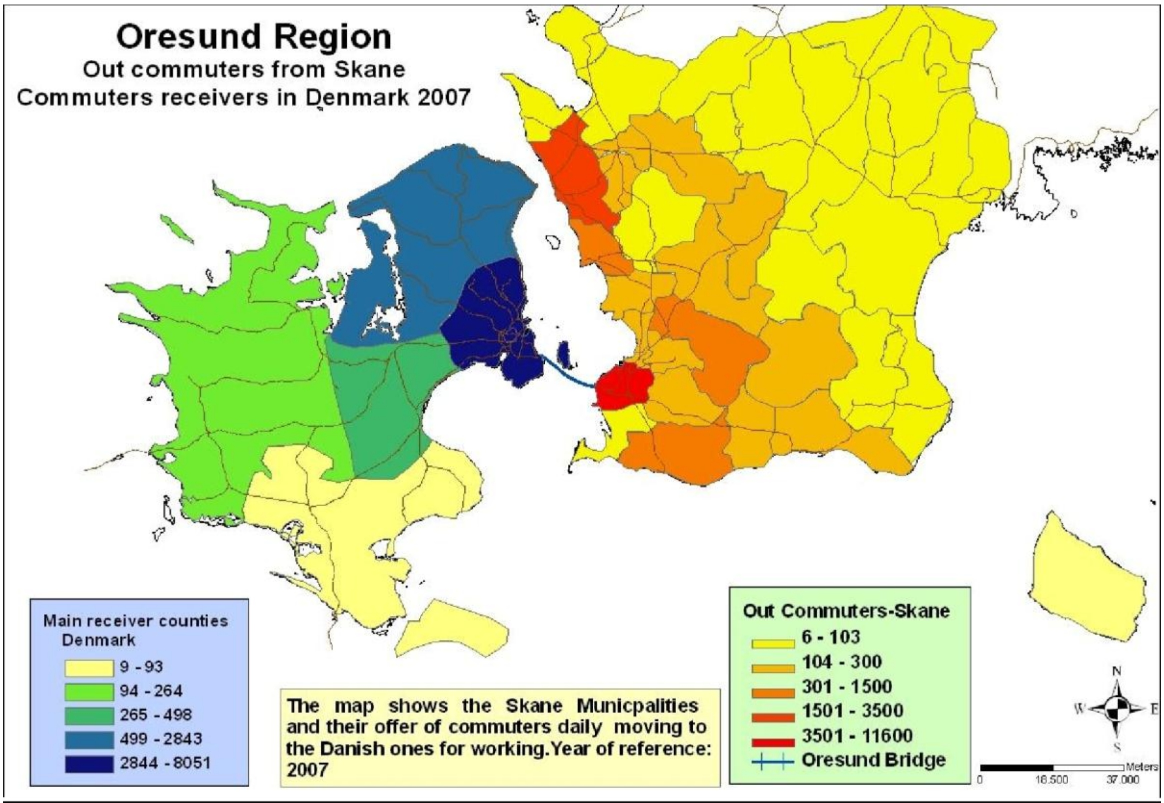


Figure 18. Main commuters receivers in Denmark. Data from Orestat database.

The map below shows the contribution of the Scania municipalities in providing commuters directed to the Danish counties for working:



Map 4. Out commuters from Scania directed to Danish counties. Own material created with GIS 9.3 software. Data from Orestat database.

5.3.2 Age and commuting

Age ranks have been included in the theoretical approach as one important factor in describing the commuting phenomenon, stating that age influences commuting decisions, with a prevalence of young and middle age classes in the process of daily travelling. The four classes explaining the age divisions are mentioned as follows: 16-24 years, 25-44 years, 45-64 years and 65+ years categories.

The majority of commuters per age rank is the group from 25 to 44 years old, with a constant and growing supremacy compared to the other groups during the entire period under investigation: since 1997 the percentage of total commuters for the group 25-44 has constantly maintained a level superior to 58%, with peaks of 69% in the year 2005; the growing in the numbers of commuters over the years has meant as well an increase in the present age group, passing from less than 2000 units in the year 2000, to circa 12000 individuals after seven years of investigation. An additional group interested by dynamic trends is represented by 16-24 commuters years old: starting from 1997 with a relatively concentrated amount of daily travellers, the growing phenomenon has achieved an important result with circa 3000 young commuters in the year 2007: more interesting is furthermore to analyze the impact of the mentioned age group in the percentage sharing compared to the other age categories: in fact from a percentage measured in 10% circa, the evolution of commuters flows has meant for the mentioned group an achievement of larger percentage during the time lag, reaching the amount of 20% in the year 2007, almost accomplishing “the catch” with the age group 45-64. This age category represents the second largest group of commuters from Scania to Denmark, with a stable progress moving from 700 units circa to 3800 individuals in the year 2007: however the remarkable notification to highlight regards the total percentage sharing compared to the other groups: in fact from a total share of 33% registered in the year 1997, the 45-64 years group percentage has continuously dropped in comparison to the other categories, been slightly reached by the third group of commuters, 16-24 years old, with levels stabilized at 20% circa of the total amount.

The last category comprehends the age group 65+; not particular interest is expressed by the trends affecting this category, since few individuals belonging to the group have commuted and nowadays do it from Scania to Denmark; however a constant increase, although marginal compared to the other group ages, is registered during the years.

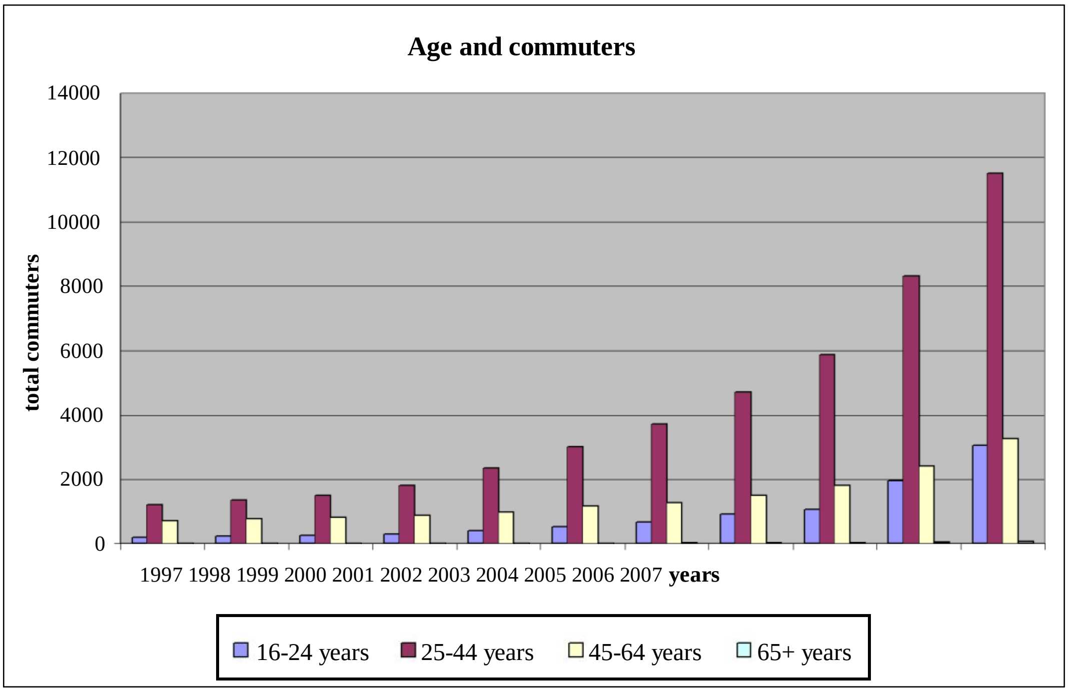


Figure 19. Commuters age from Scania. Data from Orestat database.

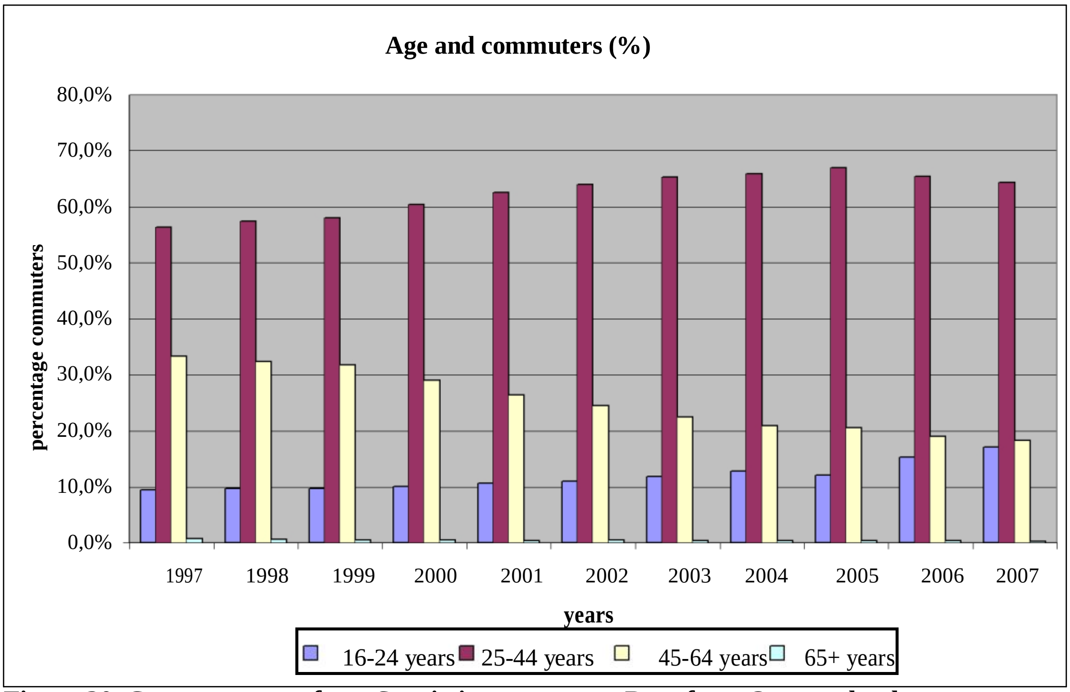


Figure 20. Commuters age from Scania in percentage. Data from Orestat database.

5.3.3 Gender and commuting

The situation of female participation in the working environment has meant for Nordic Countries and Sweden in particular an outstanding tendency of equality between genders compared to other nations around the world: a research promoted by the University of Wisconsin highlights that *"Nordic countries like Sweden have among the highest participation rate of women in the workforce, more than 75 percent"* (www.bus.wisc.edu).

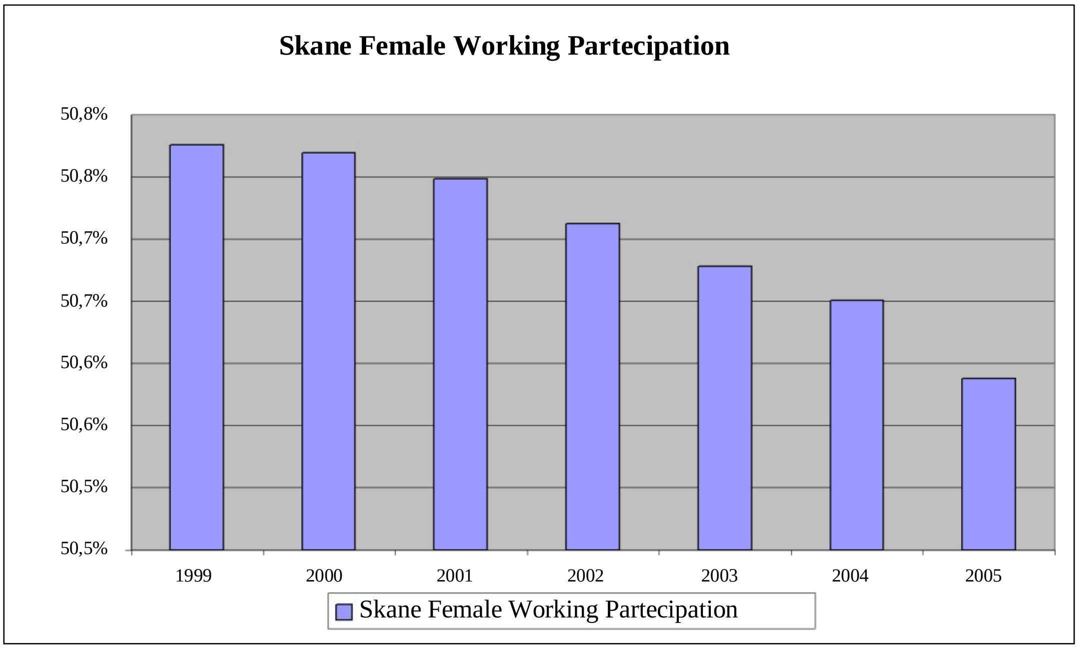


Figure 21. Female participation in the working environment-Scania region. Data from Orestat database.

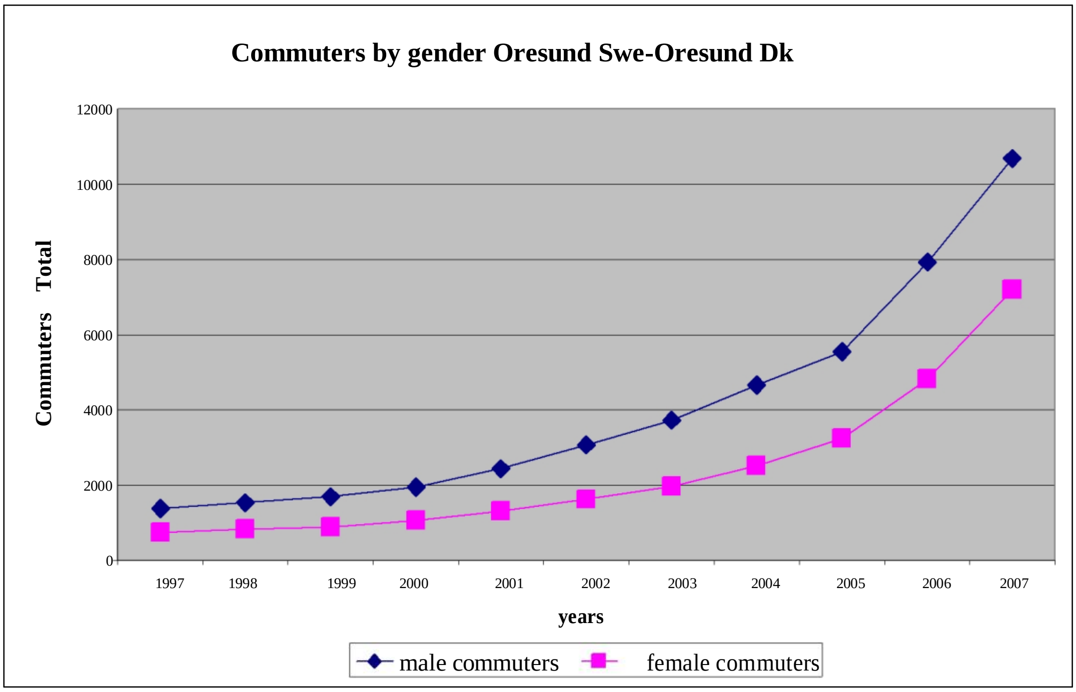


Figure 22. Commuters by gender Sweden-Denmark. Data from Orestat database.

As well as the rest of the national territory, even in Scania the distribution of female working force shows (figure 21) an overall equal division in terms of percentage of women employed in the different sectors of the economy. Although the trend since 1999 follows a continuous decrease, the absolute values do not oscillate remarkably, just a flexion of 0.2%, indicating however a majority measured in 50.6 share of female work force, higher compared to the male one for the entire period. Additionally interesting phenomenon can be scrutinized relating gender and commuters travelling from Sweden to Denmark. As been performed previously, the approach follows a more general description from national levels, commuters from Sweden to Denmark, to concentrate firstly on the Scania territorial division in Northern East-Northern West and South of the region, then finalizing investigating into single cities interested by more significant trends. The figure (n.22) illustrates the tendency of a domination in terms of numbers of male commuters through the entire period, with a gap measured in 3000 units circa in the last year of observation 2007.

Concentrating the attention on the regional division from the Scania region, the different areas from the Swedish side present a generally similar path, however with significant features.

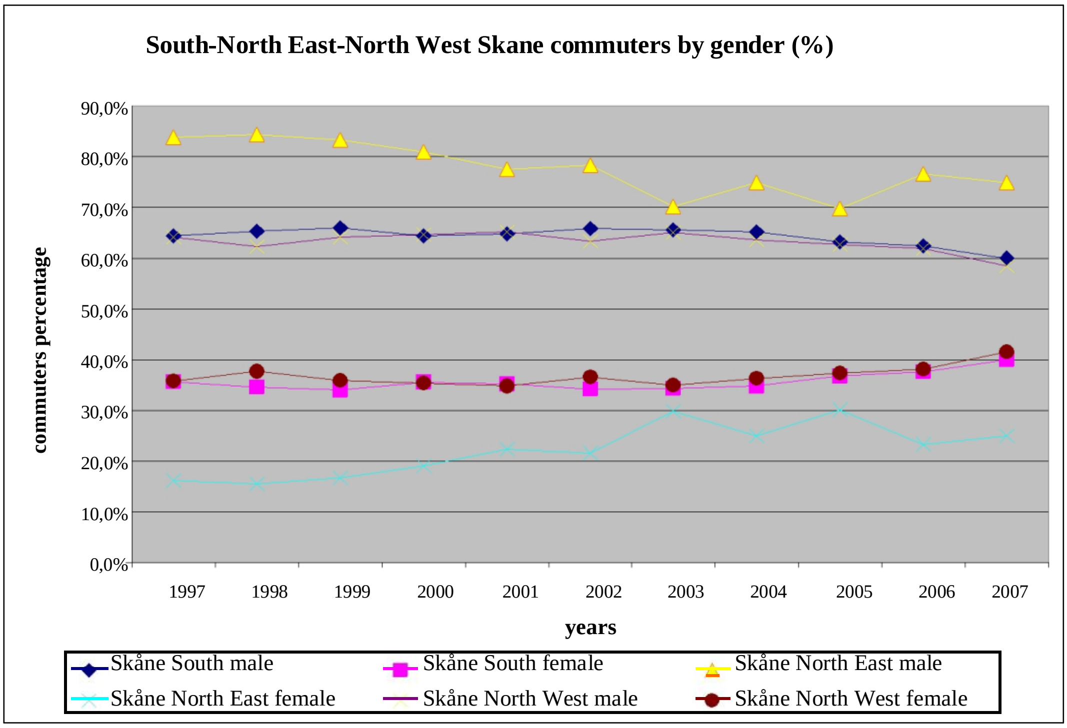


Figure 23. Commuters by gender Scania areas, North West-North East-South. Data from Orestat database.

The graph n. 23 illustrates the paths evolving during the period 1997-2007, with the three areas showing a similar tendency concerning male participation in commuting; however remarkable attention has to be focused on the course of North East Scania: the male percentage counts for 85% in the year 1997, and it is affected by a contraction during the years with a consequent increase from the female participation in commuting, assessing the balance in the year 2007 in 75% male workforce and 25% female one. Less disparities in terms of percentage have been experienced from the South and North West prospective: in fact both the areas confirm a similar starting points regarding male participation, 64%, against 36% for the female one; beside during the period under investigation a further convergence brings the gap to be reduced and counts in the year 2007 in 60% against a 40% for the female participation.

Taking a closer view on the analysis, Vellinge, Malmo and Lund are pictured in the graph n. 24, while Trelleborg, Landskrona and Helsingborg are shown in the graph n. 25. The three first cities have a similar starting point concerning male participation, around 65% and the remaining 35% occupied by the female share. However the trends, affected by an increase for male commuters percentage for Vellinge and Lund in 1999-2000, follow a stable tendency towards a certain convergence of male and female percentage, with the closest gap in the year 2007 measured in 58% male against 42% female workforce.

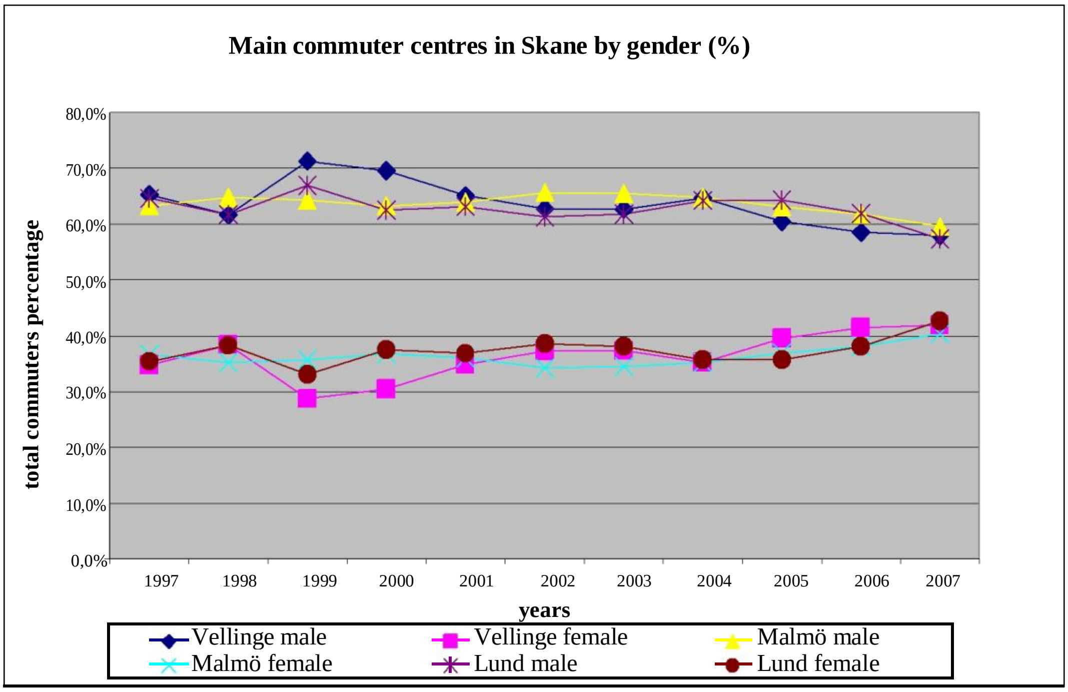


Figure 24. Commuters from main centres in Scania, Sweden by gender (%).Data from Orestat database.

The other three cities, Landskrona, Helsingborg and Trelleborg, illustrate parallel affinities with the trends seen so far: a reduction in terms of share is recorded in the year 2007, with a significant gap decrement from 75%-25% in the year 1997, to 65%-35% in the last year of the analysis. The other cities experience a less remarkable distance between genders during the years.

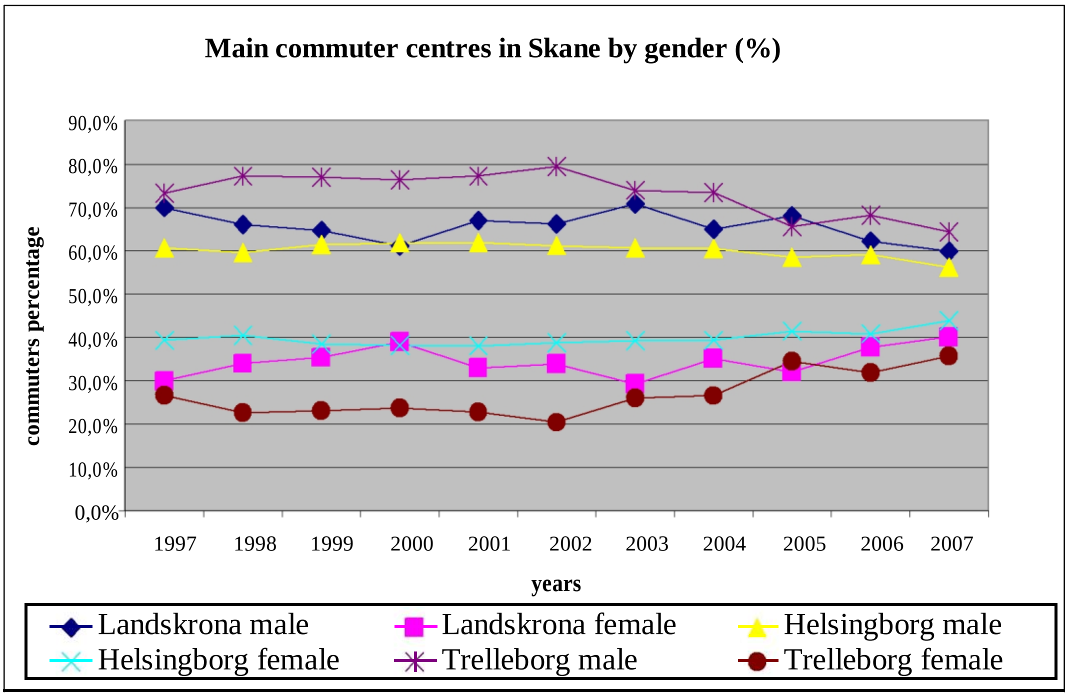


Figure 25. Commuters from main centres in Scania, Sweden by gender (%).Data from Orestat database.

5.3.4 Commuters by birth place

An additional paragraph regarding the descriptive analysis will deal with the birth place of the commuters, dividing them into five classes of country origin: Sweden, Denmark, Europe countries in EU 25, rest of the nations from Europe, and outside Europe.

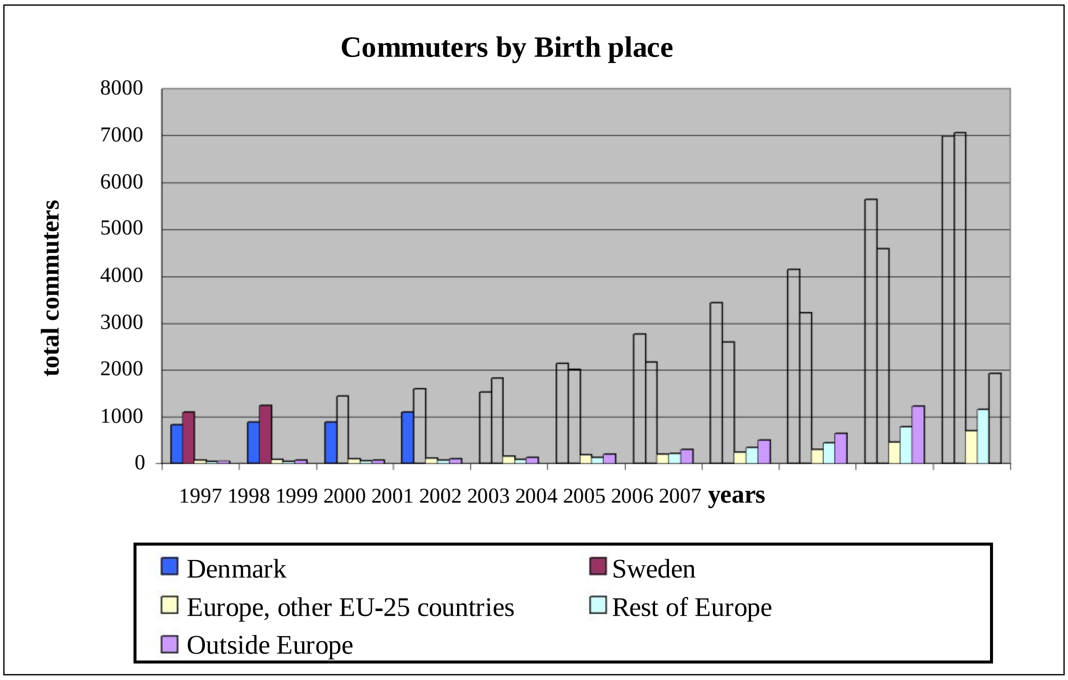


Figure 26. Commuters by birth place. Data from Orestat database.

The most notable observations are offered by the Denmark-Sweden union, and on this some considerations can be drawn: since the year 1997, a slight majority of the birth country tendency comes from Sweden, while Denmark occupies the second place in this particular ranking. The rest of the categories shares a similar amount of commuters born in countries aside Sweden and Denmark, with a remarkable increase of commuters born outside Europe, in the years 2005-2007. For the groups Sweden-Denmark, there is a particular situation from the year 2001, when Danish born commuters overcome the amounts of commuters born in Sweden, keeping the lead till 2006, when again, even if for a slight margin, Sweden born commuters counts as the largest group. Furthermore a more international workforce begins to be formed from the year 2005, when the total of commuters originated from countries outside Europe increases significantly from 645 units to 2000 circa in the year 2007.

5.3.5 Commuters, enterprise sector and size

The present paragraph deals with the enterprises sectors and the levels of commuters workforce engaged in them; besides a further investigation inquires the relation among commuters and enrolment in the different enterprises, categorized in 7 classes. The graphs n.27 and n. 28 show respectively the amounts and the percentage of the commuter levels involved in the private and public sectors: since the year 1997, the leit motive of commuters phenomenon presents a supremacy for the private sector involvement of daily workforce, with a total percentage of 73% for the first sector against 27% for the public one.

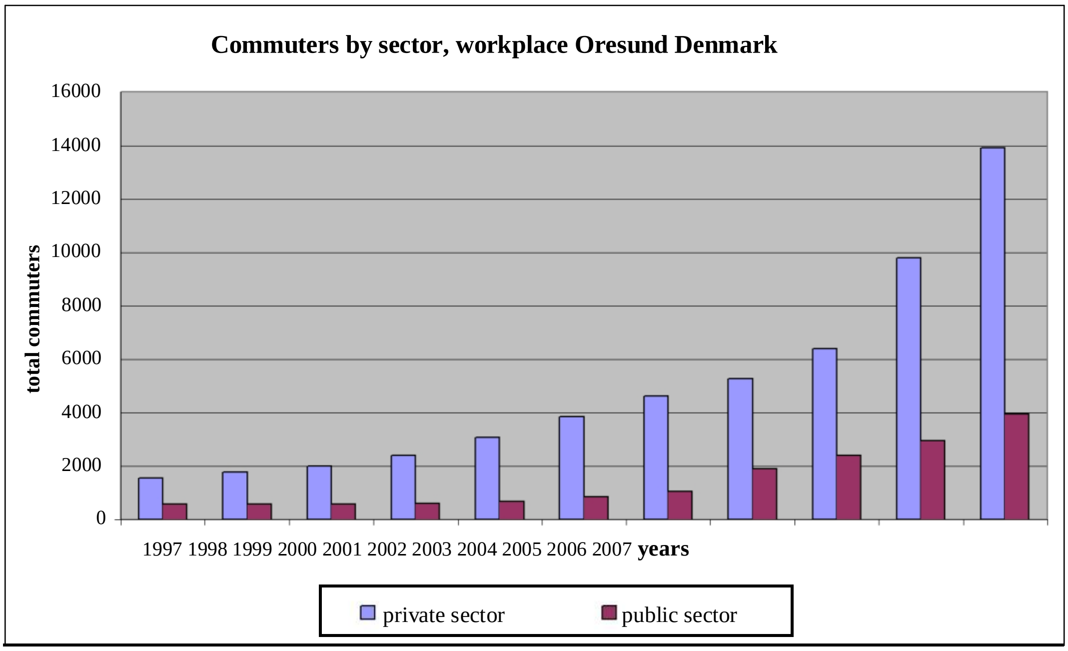


Figure 27. Commuters by enterprise sector. Data from Orestat database.

The gap has been widened through the entire period, with the maximum peak in the year 2003 in terms of percentage, with 83% of the total share for the private sector; from 2004, the difference has shown a decrease reaching the percentage of 72.7 for the private sector, to grow again till 2007 at the level of 78% against 22%.

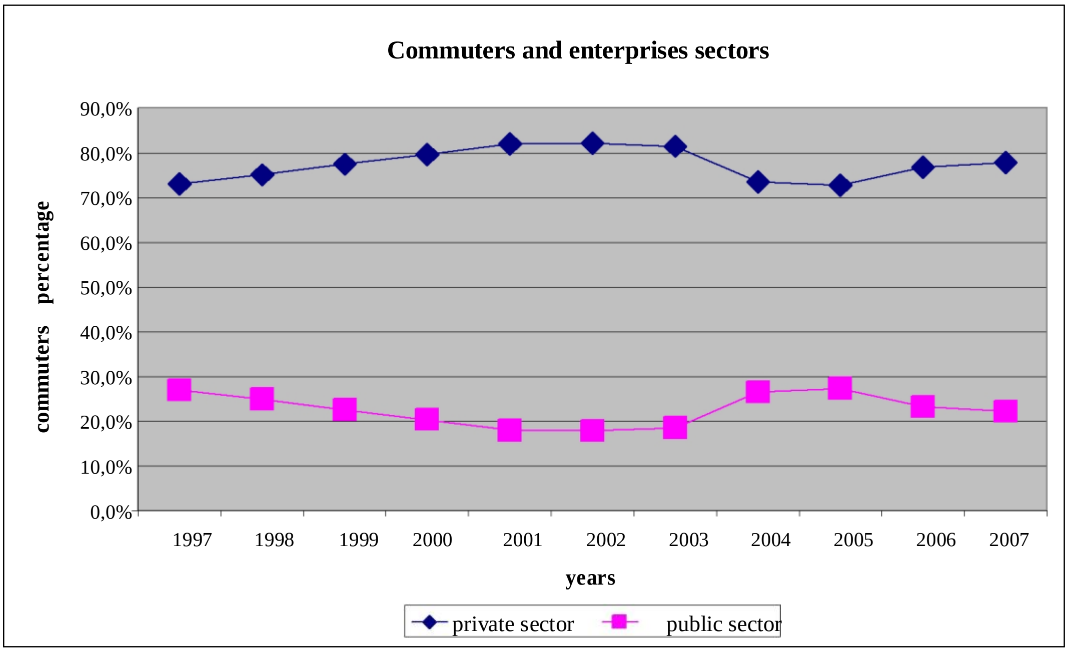


Figure 28 Commuters and enterprises sectors, Oresund Dk. Data from Orestat database.

From a closer estimation, the analysis will focus on the main work centres in Denmark to analyze firstly private and secondly public sectors contribution from the main counties.

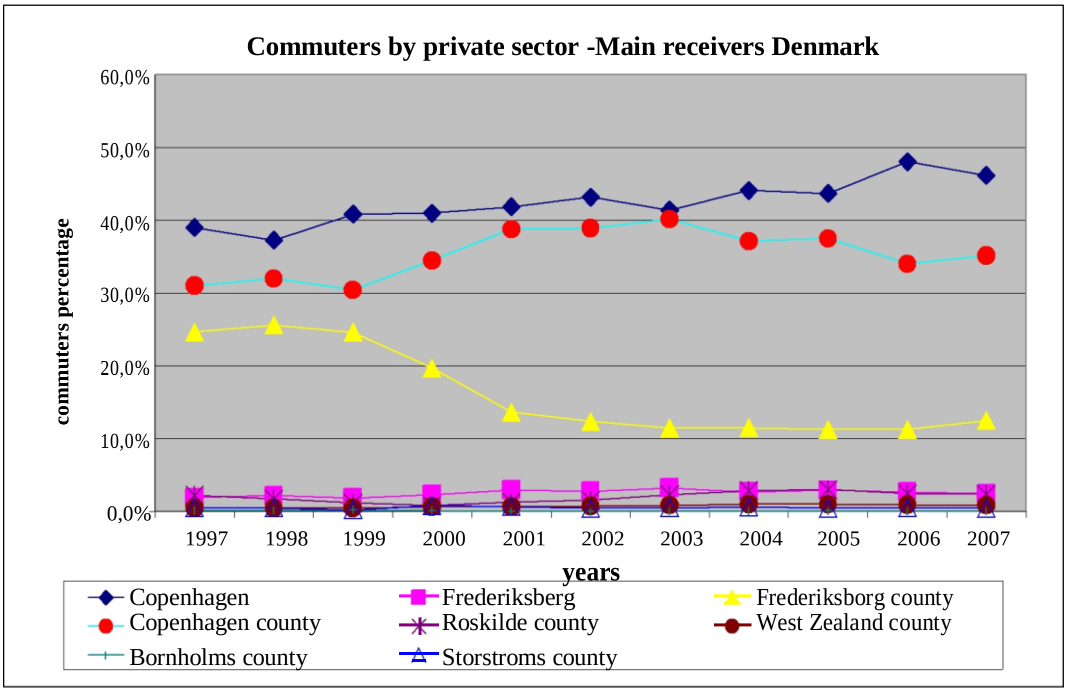


Figure 29. Commuters by private sector-Main receivers Dk. Data from Orestat database.

Copenhagen city, with a share of 48%, is the main centre of private sector enrolment for commuters from Scania. The second main receiver centre is Copenhagen county, interested by a more unstable path: from 31% of commuters share in 1997, the trend has increased in numbers till 2003 with 40%, to then being stabilized in 2007 for a total share of 35%.

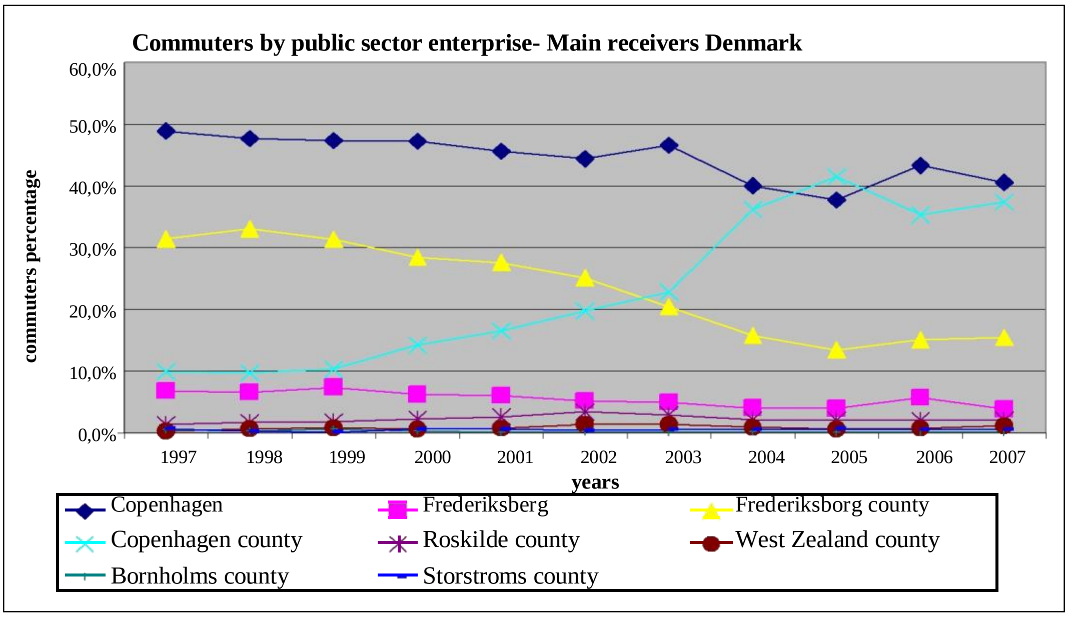
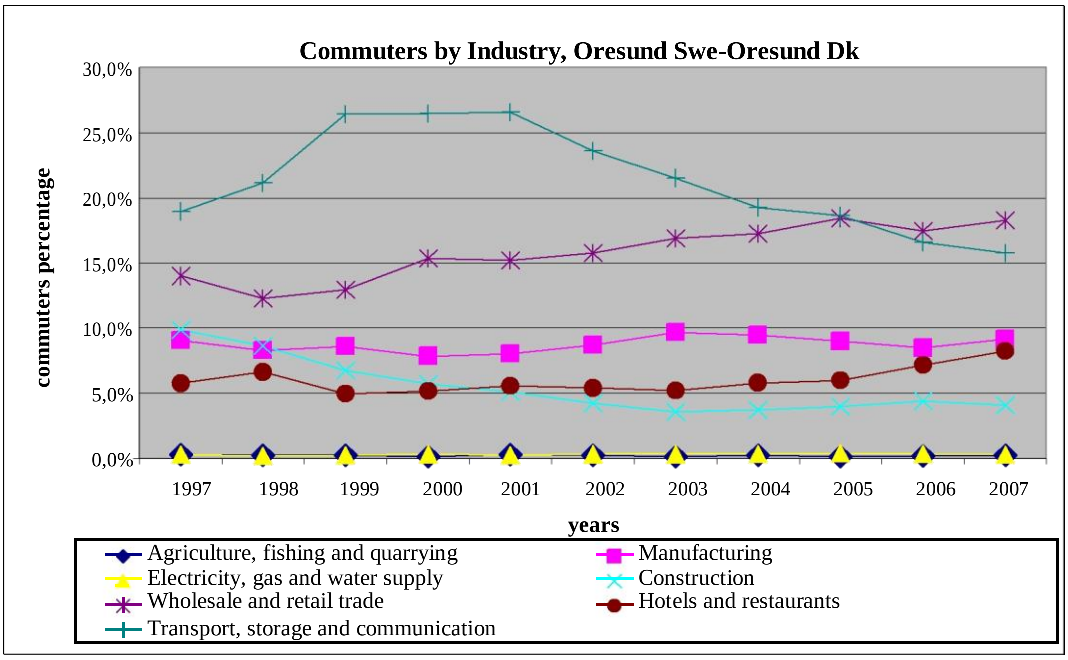


Figure 30. Commuters by public sector- Main receivers Denmark. Data from Orestat database.

Frederiksborg county experiences an opposite commuter phenomenon with a decreasing overall path, starting from a total share of 25%, then declining over the years to reach the lowest point of 10% circa of commuters employed in the private sector.

The rest of the counties, Bornholms, Roskilde, West Zealand and Storstroms, and Frederiksberg city highlight less remarkable percentage in commuters enrolled in the private sector. Concerning the public sector, the main centre for commuters is represented by the city of Copenhagen as for the private one; the City provided in the first year of investigation almost 50% of the total share of public employees, with a constant declining path during the years reaching the lowest level in 2005, 38% share, to climb again to 45% in the year 2007. Copenhagen county is in the year 2007 the second largest receiver for public sector commuting workforce, after a notable increase during the years of the commuters share: starting from a level of 10% kept stable till 2000, parallel to the Introduction of the Bridge the raising of commuters involved in the public sector reaches the intensity of 42% in the year 2005, four times higher than 1997-2000 levels. Finally the trend slows to the percentage of 38% commuters share.

For the county of Frederiksborg, an opposite trend compared to the Copenhagen one is experienced during the years 1997-2007; in fact the starting point is measured in 31, however a continuous declining characterizes the entire period, slowed down in the year 2005, lowest share of 13%, then finally stabilized in 15% in the year 2007. Frederiksberg city is the fourth centre for commuters share, reducing its impact during the years, from 8% share to 4% circa in the last year of scrutiny. The rest of the counties as seen for the private sector do not experience high levels of commuters embedded in the public sector.



Commuters by Industry, Oresund Swe-Oresund Dk
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
commuters percentage
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
years
Agriculture, fishing and quarrying
Manufacturing
Electricity, gas and water supply
Construction
Wholesale and retail trade
Hotels and restaurants
Transport, storage and communication

Figure 31. Commuters by industry, Oresund Swe-Dk. Data from Orestat database.

Regarding commuters and their involvement in the different sectors of industry, the analysis focuses on 14 different fields: figure n.31 presents seven industry sectors, including manufacturing, transport, storage and communication, while graph n.32 illustrates the paths of the remaining ones, as education, real estate, financial services.

The following commuters flows related to industry sectors demonstrate a diverse nature and dynamics evolution during the years, with several sectors sharing a large part of commuters, while the remaining ones are comprehended in a rank not acceding 10% of total share. The sectors showing interesting dynamics and larger impact in terms of commuters amount are transport and communication, retail trade, real estate and business activities and social institutions: among the listed ones, real estate sector gathers the highest share of commuters, with a vibrant increment, passing from 8% in 1997 to reach the peak in 2007 in 22% total share. The transportation and communication sector is one of the industry segments showing a decreasing path in terms of commuters: since the year 1997, after an increase lasted till 2001, with the commuters level achieving 26% total share, the flexion continues for the entire period lowering the levels to 16%. Similar trend belongs to the social institutions activities as well as to the transportation sector: the first experiences a loss from 18% in the year 1997 to the final share of 9% in the last year of investigation. The last two sectors in the group of the largest contributors of commuters, retail trade and real estate, highlight opposite tendencies: retail trade shows an increase reaching the levels of 18% in 2007, while the real estate and business activities sector demonstrates the most remarkable increment, from 8% of the year 1997, to 22% in the last year under analysis. The other sectors, manufacturing, construction, hotels and restaurants, education and financial services occupy the percentage range between 5% and 10% of the total share, with stable trends over the whole period; finally other sectors as agriculture, electricity and water supply and public and personal services share the lowest position in the contribution of commuters flows and involvement in industry sectors.

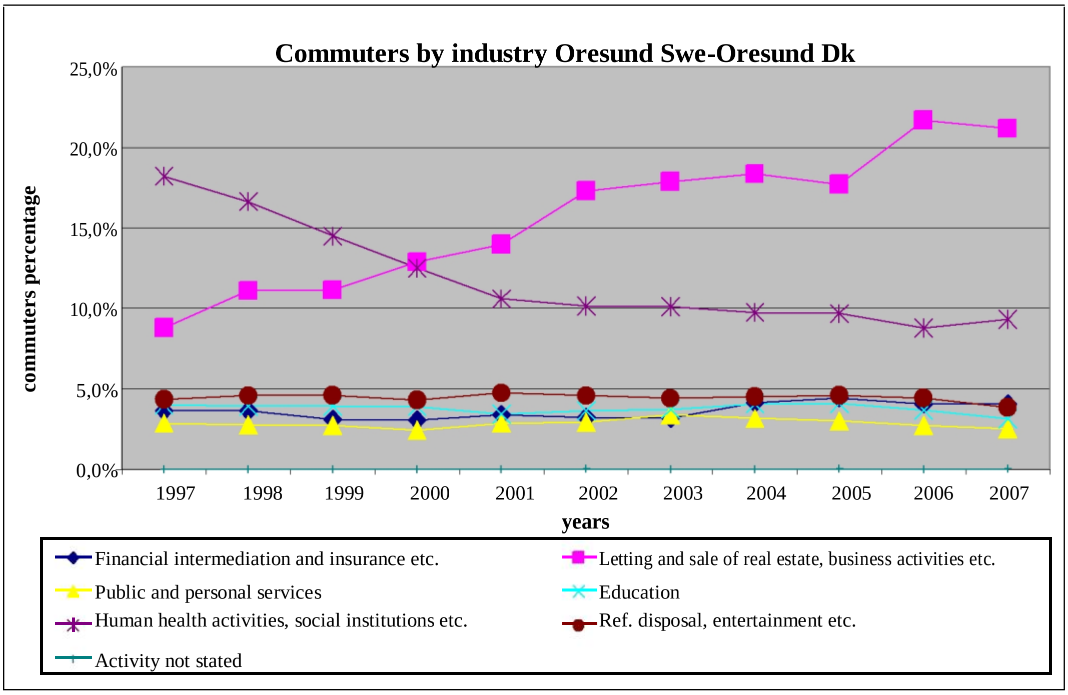


Figure 32. Commuters from Scania by industry. Data from Orestat database.

Shortly the present section will deal with the evolution of the main industry sectors and the relation with the main Danish centres. The first sector is the retail trade: different tendencies affect the paths related to the different areas.

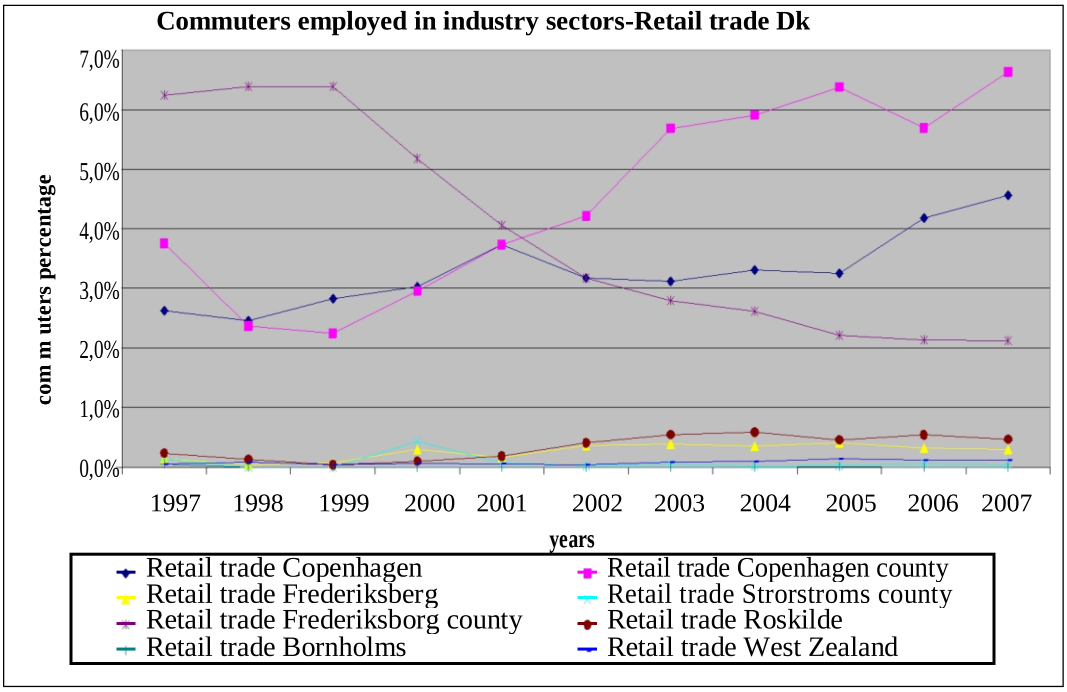


Figure 33. Commuters employed in Retail trade sector, Dk. Data from Orestat database.

From the year 1997, the leadership of the sector has changed from Frederiksborg county, to Copenhagen County and partly to Copenhagen city. The two areas share the 6.8 and 4.8% of total commuters in the retail sector. The remaining areas do not show significant levels. Concerning Real estate, the Copenhagen county is interested by a dynamic growth, while the other areas are affected by a stationary progress not involved by remarkable increments.

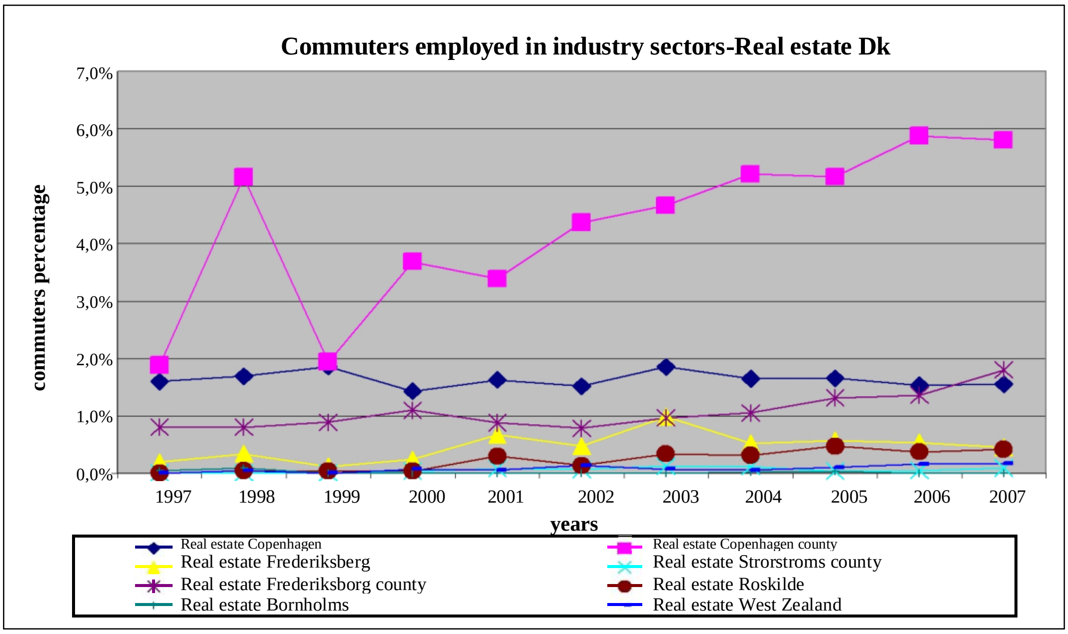


Figure 34. Commuters in Real estate, Dk. Data from Orestat database.

For the transport sector the main area is Copenhagen, raising the share of commuters from 10% to 17% in the year 2001, and then declining in the following period to the percentage of 9.5%.

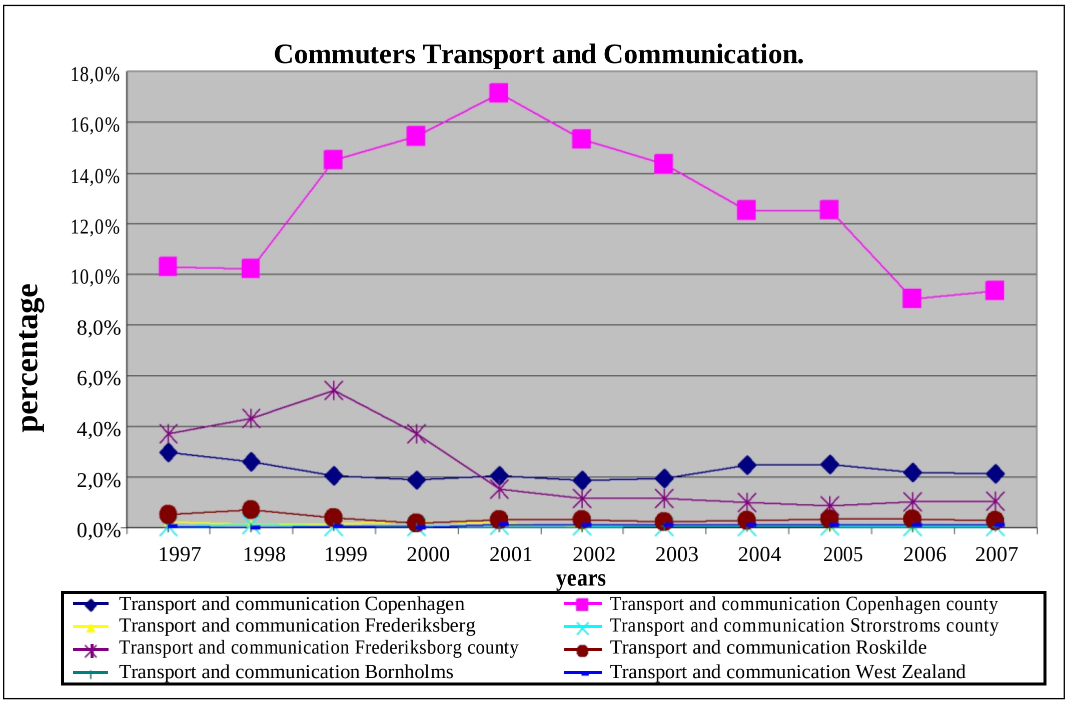


Figure 35. Commuters and Transportation and communication sector, Dk. Data from Orestat database.

Frederiksborg county represents another area implicated in the evolution of the sector, however an opposite trend shows a declining of commuters after an initial growth lasted till the year 1999, and slowed for the rest of the period. The other areas are not interested by any remarkable path.

In conclusion the paragraph ends with the social institutions activities: in the present sector, two areas are involved by dynamic evolutions, with Copenhagen City leading the total share of commuters for social institutions activities through the entire period, however losing a consistent share, from 8% of 1997 to 3.5% of 2007. Similar discourse for Frederiksborg county, where the decreasing process ends with a loss of 4.5%, moving from 7% in the first year to 2.5% in the latest one. Copenhagen county previously interested by growing phenomenon of commuters in the several sectors analysed, shows a less remarkable increase in the current sector, stabilized in 2.5% total share.

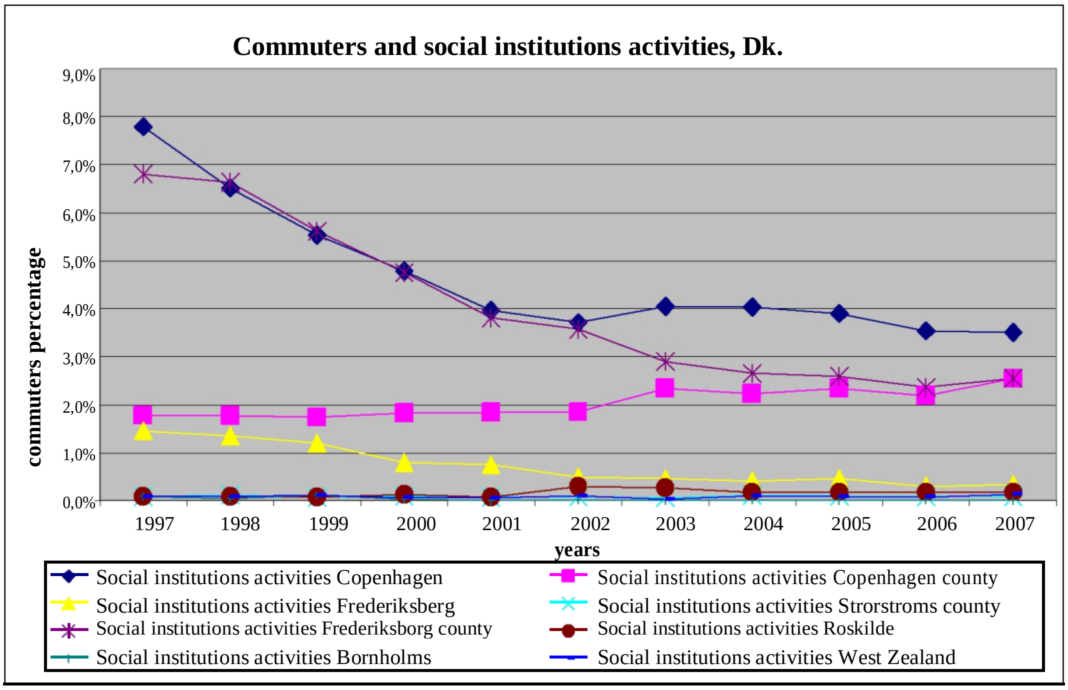


Figure 36. Commuters and social institutions activities, Dk. Data from Orestat database.

5.4 Factors analysis

Two methods will be performed following the gravity model estimation, the negative binomial with Poisson distribution and Generalized Negative binomial regression. Performing the analysis with the software SPSS 17®, the type of model is set as counts Poisson log linear, dependent variable is selected as commuters from Scania, while continuous variables, or covariates, are labour, employment, wage difference, distance, population density, unemployment, houses in Denmark and Sweden and education; categorical factors are the remaining ones listed previously. The first step for the negative binomial regression consists in checking the possible presence of overdispersion as indicated in the methodology paragraph;

Goodness of Fit-Negative Binomial regression							
	1999	2000	2001	2002	2003	2004	2005
	Value/df	Value/df	Value/df	Value/df	Value/df	Value/df	Value/df
Deviance	3,691	7,583	15,755	21,611	27,271	22,681	24,829
Pearson Chi-Square	4,752	10,526	17,266	24,161	29,857	20,335	22,472

Table 6 Goodness of fit for overdispersion check.

verifying the goodness of fit table from the years interested in the analysis (table 6), it is suggested that the predicted assumption of possible over dispersion appears in the estimations, varying from 3,691 up to 24,829 for deviance levels. For the completeness of the analysis, the results from the negative binomial regression with Poisson distribution will be presented, even if the main attention will be focused on the generalized negative model, which will reduce the overdispersion emphasized by the first model.
The estimation for the negative binomial regression illustrates the predicted indications relating to labour in the region of origin and employment in the destination region: these labour features are both positive and explain the theory of the push and pull effect, with increases due to the pushing phenomenon of commuters from the Scania region and the attraction force due to the amount of employment in the destination region, in the specific case of Copenhagen and its municipalities. For labour estimations, the percentages are in a range between 1.4 and 2.1: an increase of 1% in labour force from the origin region is translated in an increase of commuters up to 2.1%. Employment evaluations show evidence of lower percentages across the years, with less remarkable variants: in fact the variations oscillate from 0.15%, to 0.3% for every 1% increase of employment force in the destination region.

Between the two estimations characterizing the push and pull effect theory, the labour force provides an effect in pushing commuters higher than employment of ten times more circa. Concerning the other indicators of labour markets, unemployment and wage differences, these follow the predicted estimations regarding the push and pull effect theory; unemployment presents results oscillating from 0.06 to 1.7, suggesting that an increase of 1% in unemployment from the origin region pushes commuting flows amounts up to 1.7% increment. Similar trend but with opposite sign characterizes the wage difference estimations, ranging from 0.05 to 3.2%. As highlighted in the theory regarding commuting phenomenon, houses prices have a considerable influence for commuters: in the estimations provided by the analysis, increases in the prices for dwellings in Denmark push commuter flows: in fact since 1999, the rise of 1% in houses prices suggests an important effect on the commuters with increase varying from 0.4% up to 1.8%. As investigated in other studies concerning commuting phenomenon, the distance effect has a negative result on the numbers of daily travellers from Scania to Denmark: between the origin and the destination regions the results present a predicted negative sign, with levels increased when the variables comprehend population living in locations within the range of 60 kilometres and from 60 to 100 kilometres from the destination points, with the second varying from -1.3% to -1% decrease in terms of commuter amounts. The theoretical framework has emphasized the contribution of education to the growth of commuting phenomenon: the increase in education of 1% demonstrates a rise in commuting flows ranging from 0.9 to 1.5%. Regarding the geographic factors, the results offered by the population density variable suggest higher percentage of negative variations in commuting flows: the share varies from -1.7 up to -1.3 indicating that 1% increase of population density in certain locations corresponds to a negative effect on commuters flows from -1.7% to -1.3%.

Further estimations of geographic patterns are offered by the variables concerning size of the cities of origin for commuters: big cities, including locations with a population starting from 35.000 inhabitants, are characterized by positive results, however with low estimations; medium cities values imply a stronger effect compared to the larger ones, with positive levels varying from 0.7 to 1.3% increment for every 1% rise of population living in the medium cities. Train stations network in the origin region represents the last variable: the coefficient estimates prove positive results in terms of percentage differing from 0.9 up to 1.3.

The generalized negative binomial regression is performed following the steps taken for the Poisson regression; the first improvement is related to the LogLikehood parameter, reduced and less negative compared to the one shown in the Negative binomial regression with the Poisson Model (tables 8, 9). Besides the levels of deviance and the Pearson Chi square are remarkably lowered, indicating an improvement due to the usage of the Generalized Negative binomial regression.

Goodness of Fit-Generalized Negative Binomial regression							
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
	Value/df	Value/df	Value/df	Value/df	Value/df	Value/df	Value/df
Deviance	1,216	1,217	1,286	2,211	2,488	2,566	2,777
Pearson Chi-Square	1,171	1,195	1,246	1,778	1,944	2,007	2,328

Table 7 Goodness of fit for overdispersion check.

Regarding the several coefficient estimates, some differences can be found in comparing the two methods in use: while the employment values remain slightly unchanged, labour estimations present an increase in the second methodology, with a peak of 2% growth in number of commuters every 1% rise of labour force in the origin region. The distance variable remains to some extent similar to the one estimated with the first negative binomial regression, as well as the distance within locations situated in 60 kilometres from the destination region; however a rise in the values can be suggested by the generalized negative binomial regression regarding locations and distance in the range of 60 to 100 kilometres, with a general increment of the several values related to the years in the estimation, and in particular significant peaks up to 1.7% decrease of commuters every 1% population living in certain locations.

Unemployment and wage differences conserve similar patterns in comparison with the first method, however both labour factor shows a general increase towards the years of estimation: peaks for the first of 1.7% and the second -3.6% suggest stronger effects of the variables compared to the Negative binomial regression. The estimations describing the effects of houses on commuting flows follow parallel outcomes compared to the first method, however an overall decrease in the percentages suggest a less stronger impact of the mentioned variables.

A remarkable difference of coefficient estimations is instead characteristic of the variable regarding education, increasing percentages up to 2.8; population density presents similar results seen in the first method, with no particular reduction.

The latest three variables, train stations, big and medium size cities are suggesting a general reduction in terms of coefficient estimations.

5.4.1 Wages and commuters

The following section of the analysis has the aim to describe the relation among commuters and wages earned at the workplace. It is important to clarify that the data refer to the total wages earned by commuters yearly: thus the average salaries will be calculated dividing the total amount of retributions by the numbers of commuters working in the different municipalities. Besides analyzing the total wages and total commuters relation concerning the Oresund Denmark workplaces, a clarification for the time period is necessary: due to the municipality reform starting from the year 2007, for this variable the study focuses on the years from 1997 to 2005, since the aggregation of old and new municipalities interfere with the levels of commuters and total wages related to them.

The graph n.37 illustrates interesting observations regarding the issue analyzed: firstly the period from 1997 till 2000 sees a superiority in terms of total wages earned by commuters working in Denmark, with a ratio total wages/total commuters of 320.000 Swedish crowns for commuters employed in Denmark. However from the year 2001, the previous trend inverts the direction and after a slight balance of Swedish and Danish total wages for total commuters, the tendency shows a continuous increment for total earned wages of Danish commuters, reaching a gap of 130.000 Swedish crowns circa in the year 2007.

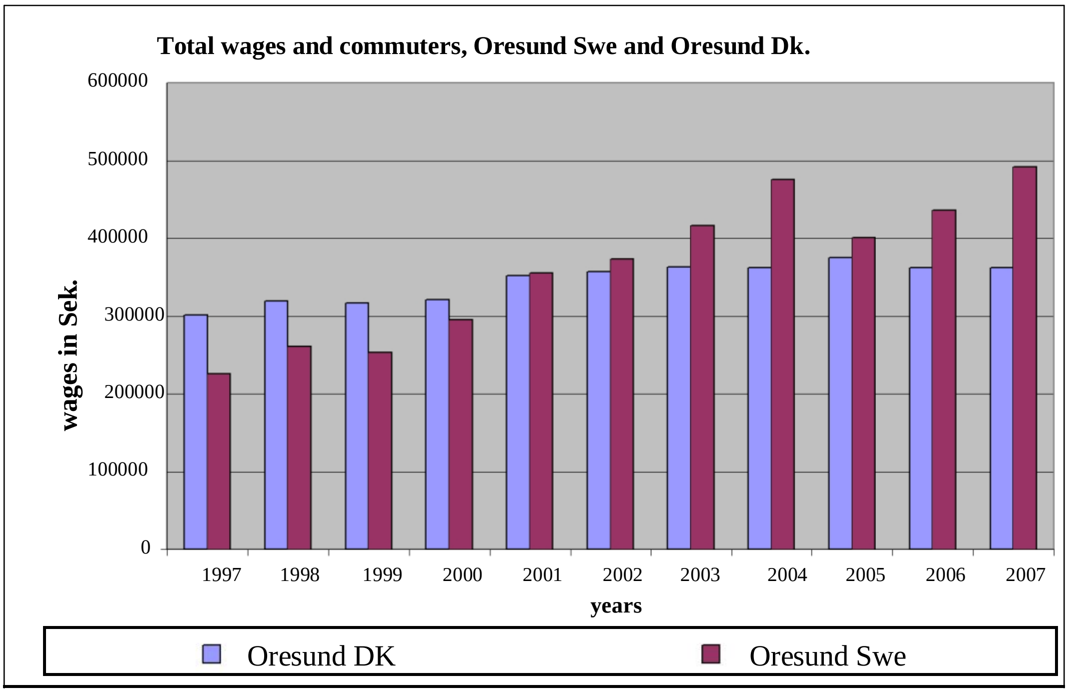


Figure 37. Wages and commuters, Oresund Swe and Oresund Dk. Data from Orestat database.

Focusing on South, North West and North East of Scania (graph n. 38), the first two areas are characterized by the peaks in the years after the introduction of the Bridge, with the ratio of total wages and total commuters in circa 500.000 Swedish Crowns yearly, increasing the initial amount measured in 200.000 Sek of + 150%. The levels for the total wages earned through the period 1997-2007 in Scania North East are less noticeable, with an almost stable path with similar ranks at the extremes of the time lag, measured in 250.000 Sek yearly earned.

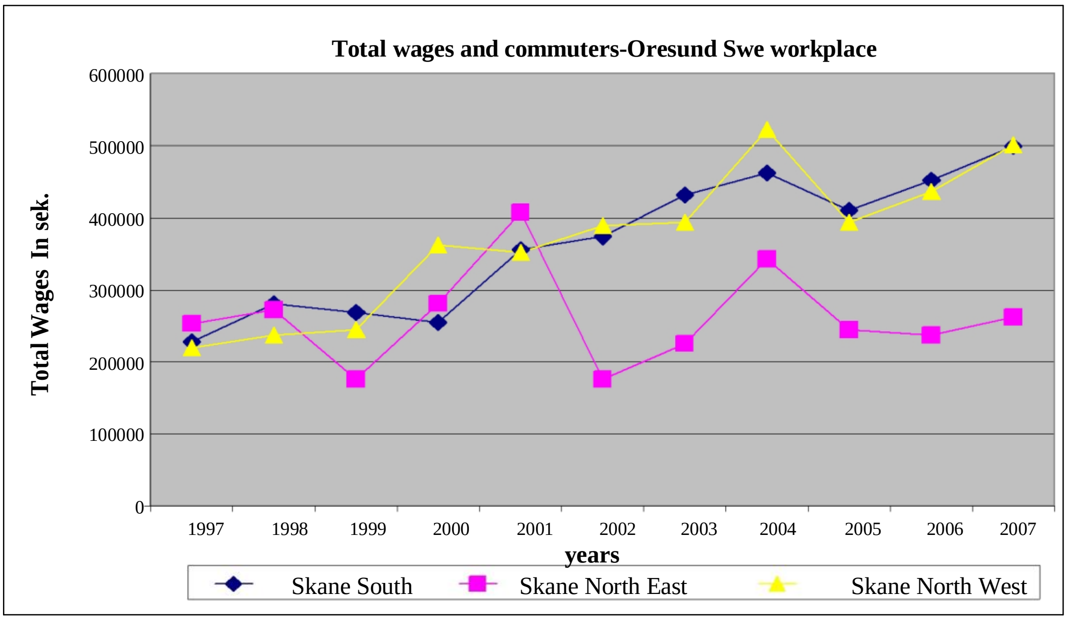


Figure 38. Total wages and commuters-Oresund Swe, workplace. Data from Orestat database.

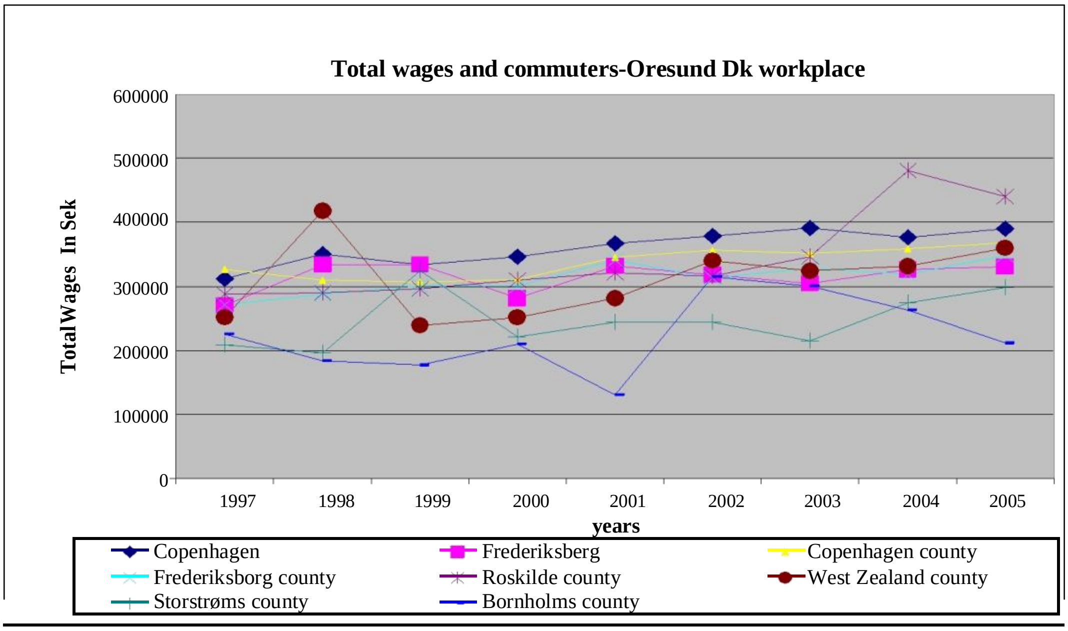


Figure 39. Total wages and commuters-Oresund Dk workplace. Data from Orestat database.

Copenhagen and Copenhagen County (graph 39) illustrate similar tendencies in terms of ratio total commuters and total wages, with a slight increase during the years. More dynamic is instead the evolution of total wages and commuters for Roskilde county, where the peak is reached in 2004, jumped from 350.000 Sek estimation of 2003, to 480.000 Sek of the following year. The remaining counties have a lower ratio in the rank from 200.000 to 300.000 Sek with increases and decrements during the entire time lag.

Taking into account the relation between total wages and commuter genders, the Swedish workplaces are more likely to experience a sharp division between the main two areas of commuters affluence, North West and South of Scania; in fact in the two sub regions the male commuters count for an higher total wages and total commuters ratio positioning their wages at 580.000 Sek yearly circa. Female commuters both working in South Scania and North West count for almost half of the levels of the male colleagues, 350.000 Sek for the first ones, 300.000 Sek circa for the seconds. There is instead no clear disparity in total wages earned by male and female commuters working in the North East part of Scania, with a ratio of 280.000 Sek circa for both groups.

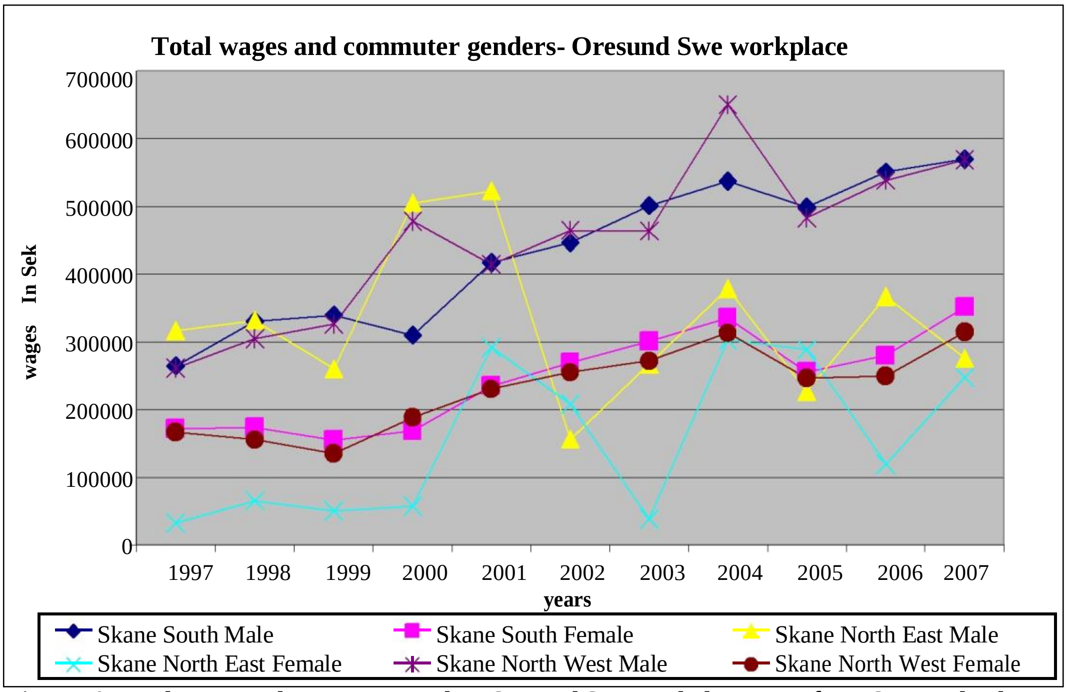


Figure 40. Total wages and commuter genders-Oresund Swe Workplace. Data from Orestat database.

Less remarkable differences pop out instead from the estimation of total wages earned and commuters genders in the Oresund Denmark workplaces side. In fact as it can be predicted the main centres Copenhagen and Copenhagen county are characterized by superiority of male commuters and wages compared to the female one. However related to the Swedish workplaces, the difference in terms of total wages is less widened, with a gap of 140.000 Sek circa for the workers enrolled in the Copenhagen area divided by gender, and a gap of 160.000 Sek for the male and female workers in the Copenhagen county division. A more remarkable convergence is experienced by the commuters involved in the Frederiksberg and Frederiksborg county areas, with a gap from the first ones measured in only 50.000 Sek, while slightly more than 90.000 Sek counted as disparity between genders for the second area.

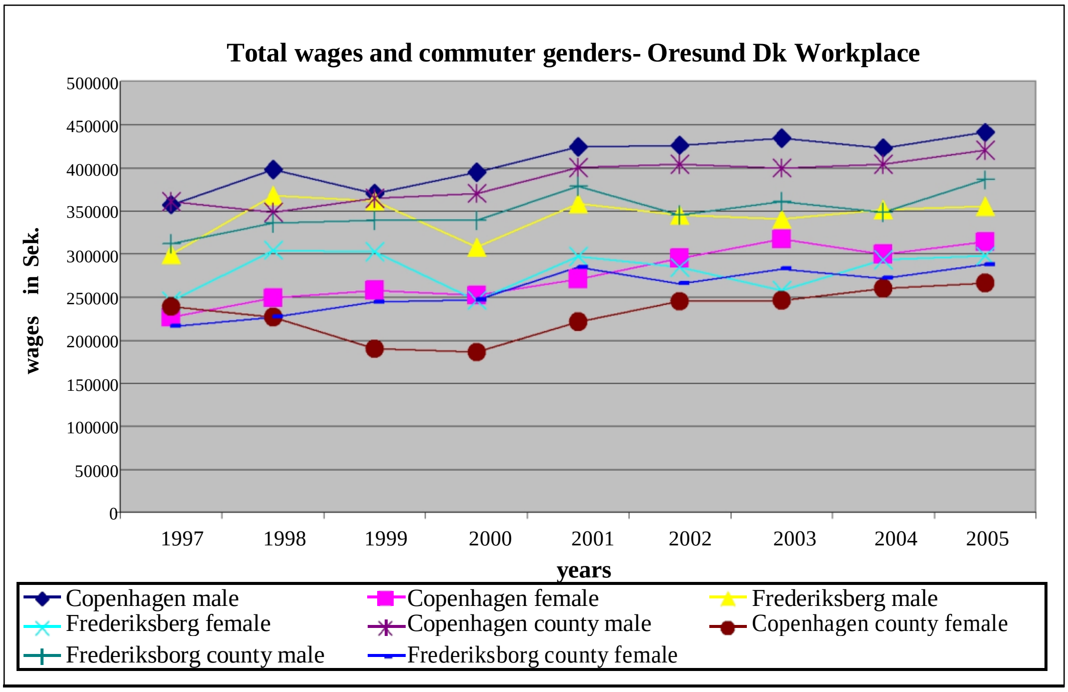


Figure 41. Total wages and commuter genders-Oresund Dk workplace. Data from Orestat database.

The final section of the analysis concerning total wages and commuters will deal with the investigation across the different sectors in the Danish and Swedish industries and compare the followings with wages earned by the commuters. The graph below investigates side by side the first group of industries, listed as agriculture and fishing, electricity and water supply, construction and manufacturing.

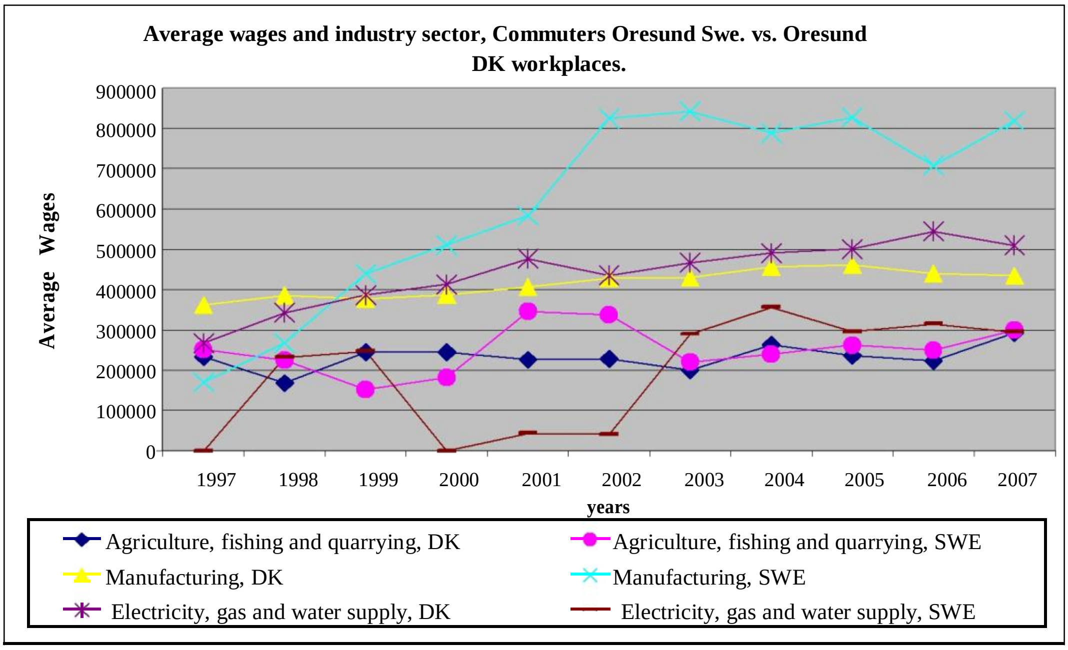


Figure 42. Average wages and industry workplace, Oresund Swe vs. Oresund Dk. Data from Orestat database.

Agriculture and fishing sector is characterized by similarities regarding the Swedish and Danish commuters phenomenon and relation to average wages: in fact in both the areas the levels of wages do not differ significantly with a convergence in terms of wages reached in the latest year. Different discourse applies to the remaining sectors of the current first group, with remarkable disparity especially for the manufacturing segment: as it is shown in the graph n. 42, the average wage for commuters working in the Danish territory begins with a noticeable level close to 350.000 Sek yearly, while the point for the Swedish side is measured in slightly 180.000 Sek yearly; the gap with commuters in Denmark for the same sector is measured in almost 500.000 Sek.

Fewer significant disparities are involved in the sector of electricity and water supply, with an upstream trend of superiority in average wages for commuters working in Denmark compared to the ones working in Sweden: the final gap is measured in 200.000 Sek yearly earned.

The second group gathers three more sectors, constructions, wholesale and retail trade, and hotels and restaurants: besides the fact that certain industry sectors experience a dynamic trend with increases and decreases, for instance construction, the characteristic of the current group relies on closer gaps in terms of wages for all the segments: almost no gap for constructions in Sweden and Denmark, with 400.000 Sek circa of wage average, slightly 20.000 Sek difference between wholesale and retail trade, and finally a more remarkable gap of 200.000 Sek for the only sector in this group emphasizing a remarked disparity, hotels and restaurants.

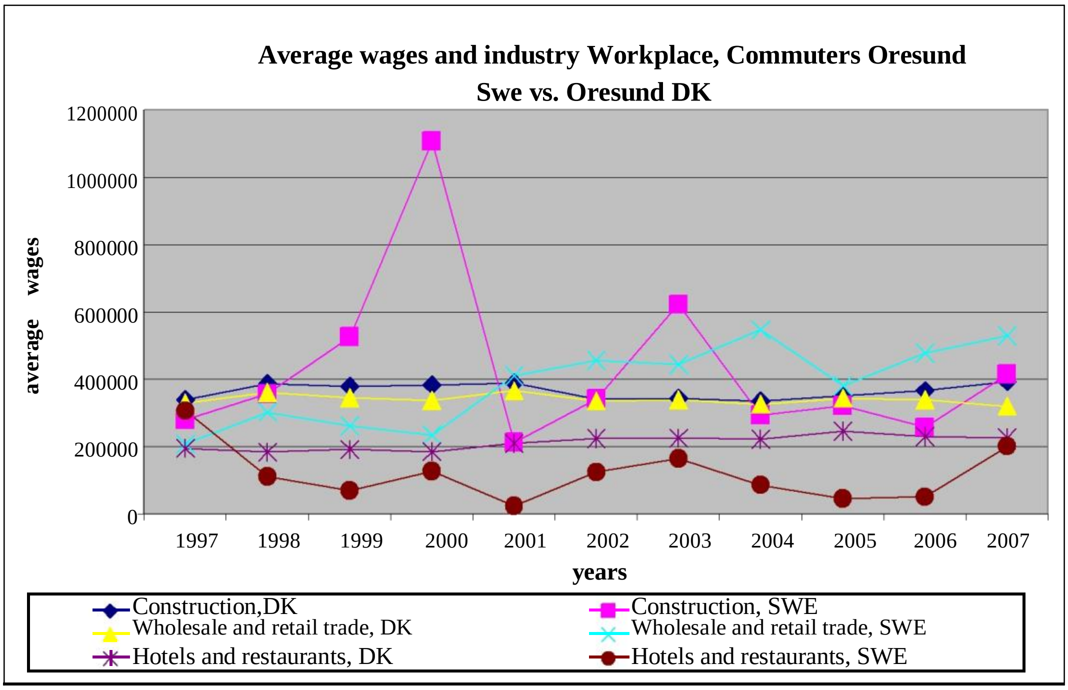


Figure 43. Average wages and industry workplace, Commuters Oresund Swe vs. Oresund DK. Data from Orestat database.

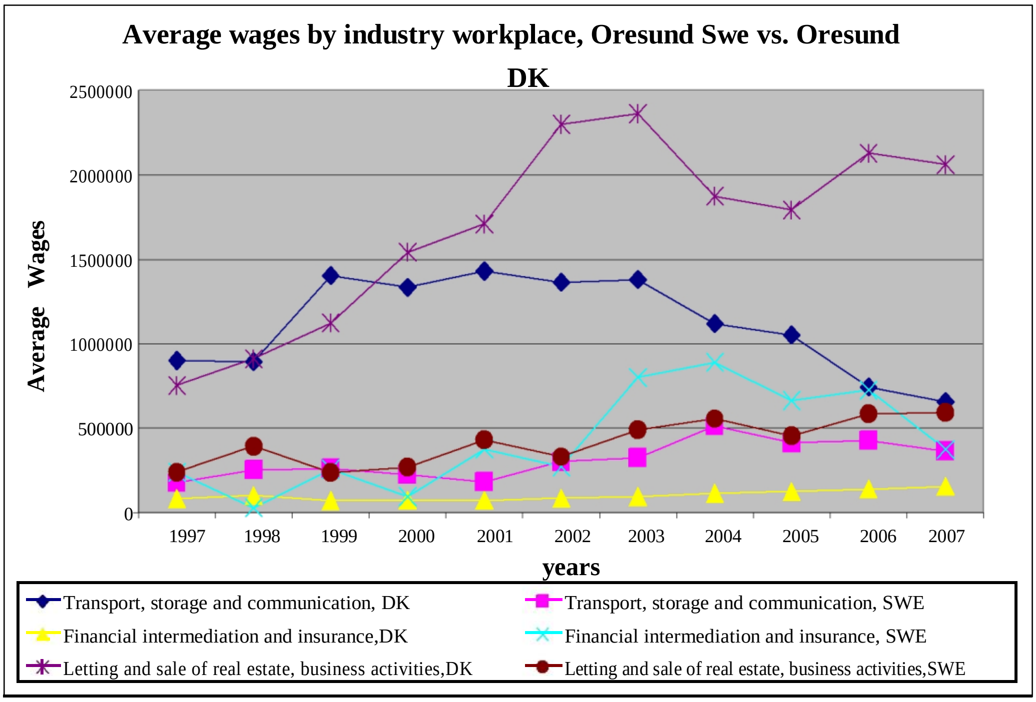


Figure 44. Average wages by industry Oresund Swe vs. Oresund Dk. Data from Orestat database.

The third group, including transportation and communication, financial services, and real estate sectors shows a remarkable difference in terms of average wages gap from the Oresund Swedish part and the Danish one. The most noticeable disparities are due to the real estate and business activities sector, with a remarkable gap between the Danish and the Swedish average wages: in fact if for the first one the levels reach peaks as 2.400.000 Sek average wage earned yearly, for the Swedish side the major result is achieved in 2007 with an average wage of 600.000 earned by Danish commuters in the Scania region.

Transportation and communication sector has to a less extend a distinction among the two territories involved in the analysis. The last sector of the present group relates to the financial intermediation and insurance, with a less dynamic evolution during the years, showing a gap in the year 2007 of 250.000 Sek circa, with 400.000 Sek earned by Danish commuters in Scania, against 150.000 Sek for Swedish ones.

The last group comprehends four sectors, listed as public and personal services, education, health and social institutions, and finally disposal, entertainment. The sector mainly interested by significant disparities is the one regarding health activities and social institutions: in fact in 1997 the average wage for Swedish commuters in Denmark counted for 1.200.000 Sek, then lowered to the level of 1.000.000 Sek for average wage yearly.

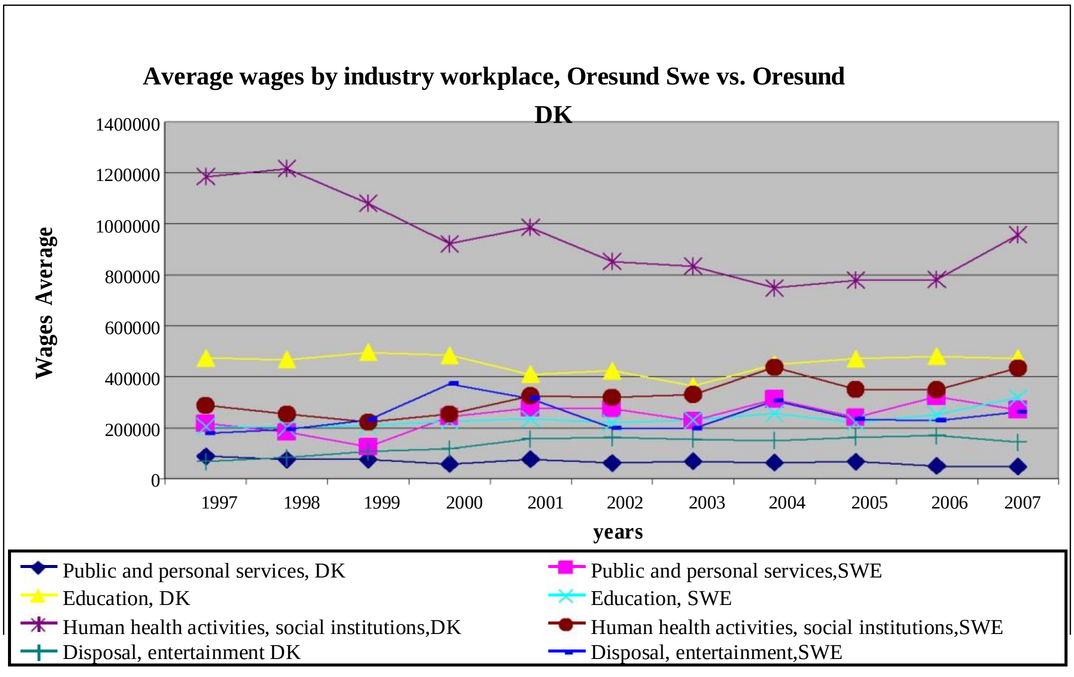


Figure 45. Average wages by industry Oresund Swe vs. Oresund Dk. Data from Orestat database.

In Sweden instead the levels are certainly inferior, starting from 300.000 Sek to finally reach the peak of 400.000 Sek. For the remaining sectors, the disparities count for smaller amounts, as education, 450.000 Sek average wage for Swedish commuters in Denmark against 300.000 Sek for Danish commuters, disposal and entertainment, 150.000 Sek for Swedish commuters in Denmark against 230.000 Sek for Danes commuting to Sweden, and finally 70.000 Sek for Swedish commuters to Denmark against 230.000 Sek for Danes commuting to Sweden for the public and personal services sector.

Table 8. Negative Binomial- Poisson Model

	1999		2000		2001		2002		2003		2004		2005	
	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error
Employment	,154***	,0023	,181***	,0187	,193***	,0159	,318***	,0009	,321***	,0008	,428***	,0181	,325***	,0097
Labour	1,827***	,0087	1,736***	,0682	2,034***	,0892	,980***	,0052	1,519***	,0043	1,631***	,0586	1,450***	,0517
Distance	-,011***	,0006	-,036***	,0053	-,006**	,0049	-,019***	,0004	-,022***	,0002	-,041***	,0029	-,025***	,0033
Unemployment	,367***	,0143	,062***	,0631	1,753***	,1411	,363***	,0089	,738***	,0070	,004***	,0214	,287***	,0849
Wagediff.	-1,207***	,0245	-,618***	,1883	-3,225***	,2463	-1,065***	,0143	-1,350***	,0122	-,053***	,0315	-1,146***	,1208
HouseSwe.	,008**	,0136	,027**	,1327	,755***	,1085	,238***	,0075	,341***	,0066	,191***	,0353	,178***	,0512
HouseDk.	,464***	,0206	1,548***	,1570	1,705***	,1560	,427***	,0101	,177***	,0085	1,852***	,0933	,345***	,0851
Pop. Density	-1,678***	,0279	-1,349***	,2356	-1,762***	,2150	-,267***	,0154	-1,442***	,0134	-1,105***	,1485	-1,320***	,1413
Train	,328***	,0054	,431***	,0472	,412***	,0372	,267***	,0033	,934*	,0031	,785**	,0356	1,212***	,0371
City	,391***	,0068	,155***	,0658	,518***	,0617	,522***	,0036	,910*	,0032	,648**	,0454	,371***	,0333
Medium	,907***	,0044	,739***	,0400	1,009***	,0400	1,312***	,0028	1,178***	,0022	1,073***	,0317	1,383***	,0263
Small	0[a]	.	0[a]		0[a]		0[a]		0[a]		0[a]		0[a]	
Education	1,460***	,0308	1,882***	,1435	1,503***	,2181	1,536***	,0123	1,567***	,0084	1,958***	,0877	,914***	,0778
Distance60	-,049***	,0030	-,261***	,0283	-,104***	,0241	-,072***	,0023	-,226***	,0013	-,213***	,0195	-,292***	,0166
Distance100	-1,208***	,0035	-1,252***	,0305	-1,366***	,0358	-1,096***	,0024	-1,013***	,0016	-1,091***	,0201	-1,000***	,0184
Distance160	0[a]	.	0[a]		0[a]		0[a]		0[a]		0[a]		0[a]	
P-value	0.000		0.000		0.000		0.000		0.000		0.000		0.000	
LogL	-4243,815		-11552,270		-20129,287		-32735,463		-44966,033		-82306,863		-118388,546	
N.obs.	1844		2779		3032		3855		4710		5945		7365	

Note: *p<0.1, **p<0.05, ***p<0.01, a. Set to zero because this parameter is redundant.

Table 9. Generalized Negative Binomial Regression.

	1999		2000		2001		2002		2003		2004		2005	
	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error
Employment	,154***	,0023	,162***	,0619	,200***	,0253	,330***	,0437	,387***	,0407	,471***	,0227	,346***	,0163
Labour	1,827***	,0087	2,085***	,1702	2,618***	,1107	1,271***	,1904	1,990***	,1629	1,567***	,0649	1,644***	,0642
Distance	-,011***	,0006	-,036***	,0183	-,010***	,0081	-,033***	,0160	-,011***	,0115	-,033***	,0048	-,057***	,0056
Unemploy.	,367***	,0143	,576***	,2468	1,763***	,1943	,092***	,3858	1,249***	,2771	,118***	,0481	,772***	,1422
Wagediff.	-1,207***	,0245	-1,852***	,7070	-3,594***	,3910	-,513***	,7081	-1,937***	,6057	-,012***	,0601	-1,697***	,2118
HouseSwe.	,008**	,0136	,504**	,4624	,934***	,1701	,134**	,3486	,632***	,3361	,222***	,0436	,292***	,0843
HouseDk.	,464***	,0206	,984***	,4736	1,333***	,2022	,205***	,4246	,032***	,3572	1,520***	,1178	,408***	,1228
Pop. Density	-1,678***	,0279	-1,552**	,6303	-,092**	,2800	-,006**	,5055	-,751***	,4183	-1,261***	,1532	-,315***	,1513
Train	,328**	,0054	,310***	,1082	,021***	,0391	,167**	,0946	,464*	,0810	,733***	,0292	,543***	,0581
City	,391***	,0068	-,373*	,1583	-,319***	,0863	,731***	,1446	,130*	,1455	,526***	,0610	,254***	,0317
Medium	,907***	,0044	,179*	,0956	,217***	,0497	,480***	,0959	,373***	,0869	,696***	,0353	,623***	,0360
Small	0[a]	.	0[a]	.	0[a]	.	0[a]	.	0[a]	.	0[a]	.	0[a]	.
Education	1,460***	,0308	,406***	,4865	2,835**	,2848	,407***	,5853	1,221***	,4266	2,287***	,1511	,294***	,1554
Distance60	-,049***	,0030	-,057***	,0843	-,196***	,0351	-,065***	,0866	-,268***	,0643	-,119***	-,0259	-,195***	,0253
Distance100	-1,208***	,0035	-1,587***	,0933	-1,795***	,0507	-1,324***	,1065	-1,411***	,0857	-1,301***	,0298	-1,351***	,0333
Distance160	0[a]	.	0[a]	.	0[a]	.	0[a]	.	0[a]	.	0[a]	.	0[a]	.
N.Obs.	1844		2779		3032		3855		4710		5945		7365	
LogL.	-4072,461		-7873,930		-14639,931		-32254,114		-40325,322		-52298,021		-66371,654	
P-value	0.000		0.000		0.000		0.000		0.000		0.000		0.000	

Note: *p<0.1, **p<0.05, ***p<0.01, a: Set to zero because this parameter is redundant.

5.5 Discussion for descriptive and factors analysis

The commuting phenomenon has experienced in Sweden an important growth in the latest years both at the national and at the regional level. The observed fact has been in Scania highly significant even thanks to the construction of the Oresund Bridge, boosting the daily mobility between two transnational regions. The numbers highlighted in the descriptive analysis prove concretely the impact of the Infrastructure for enhancing mobility: the phenomenon firstly interesting less than 2000 daily travelers in the year 2000, has reached the peaks in the year 2007 of circa 15300 workers travelling from Sweden to Denmark though the Bridge. A less remarkable tendency has interested Danish workers commuting to Sweden, however a significant increase can be noticed as well from the other side of the Oresund region, with a peak of 700 units circa in 2007, from the initial 130 circa of 2000.

Taking a further step in the discussion, more insights focus on the geographic origins of commuters and the top working destinations in Denmark for the flows of the daily travelers: the proximity to the Bridge certainly explains in part the high percentage of commuters living in the south part of Scania region; in fact, even if South Scania counts for circa 60% of working population in Scania, in the time lag from 1997 to 2000, the shares of commuters were essentially equal for the different sub-regions in Scania. Successively the introduction of the Bridge, the phenomenon has increased exponentially for South Scania: from 1500 circa to 14000 workers exclusively from the southern part of the Swedish region, against slightly more than 2000 from the other 2 regions. The main cities involved in providing labor force for Danish territory are Malmo, Lund, Helsingborg, Landskrona; regarding this feature, an important finding to highlight consists in the evolution of Malmo city and contribution to commuting: in fact from the year 2000, the biggest city in Scania has increased remarkably its share of commuters, almost doubling the percentage from 37 to 60% circa. The proximity to the Bridge has certainly influenced positively the tendency from the Swedish City to the Danish region. Focusing on the Zealand regions, Copenhagen City has the highest spot in attracting labor force from Sweden, with almost half of the totality of commuters travelling to Denmark: in the year 2007, 8000 circa workers move daily directed to the Danish Capital City. The rest of the share is divided between Copenhagen County and Frederiksborg County, respectively 6500 and 2800 circa.

Regarding the gender distribution of commuters, a clear predominance of male workers characterize mainly all the locations and the period during the time lag of investigation: in fact

even if the Scania region has shown an overall equal gender division in the labor force, still the commuter phenomenon belongs mainly to male individuals; the shares are generally in a range from 60% up to 80% of male participation during the entire period. However a remarkable insight emphasized noticeably in the last years, 2005-2007, demonstrates a progressive gap reduction among the genders, especially from areas as Malmo and Lund.
Interesting tendency is related to the birth place provenience of commuters from Scania to Zealand: the main two groups are represented by Danish and Swedish born citizens, which share similar percentages in terms of commuters; besides from the year 2000, an increase of Danish born commuters has overcame the share of Swedish born workers, underlining the importance of the Introduction of the Bridge for Danes which certainly have moved to Sweden for living, still commuting to their native country to work. Finally the percentage of commuters born outside Europe has increased remarkably in the last years, doubling the amount of 1000 recorded in 2006 to 2000 circa in the following year.
Concerning the relation between age and commuters, a certain group of individuals characterizes the majority of workers travelling daily: the age range between 25 to 44 dominates over the other different groups. In fact the percentages vary from 50% up to 69%; an interesting tendency distinguishes instead the young commuters, in the age from 16 up to 24: this group from an initial share in 1997 of slightly 10% of the total share, has reached 18% circa in 2007, equalizing the group of workers within 45 to 64 years old, characterized instead by a remarkable slow down in participating in commuting phenomenon.
Focusing on the commuters involvement in the sectors of economy, the private one employs the majority of the workers from Scania compared to the public sector: during the years the steep growth characterizing the private sector has attracted commuters reaching in the last year, 2007, circa 14000 workers compared to less than 4000 engaged in the public one. Copenhagen City confirms the predominance in attracting commuters for both the sectors, followed by the municipalities from the Copenhagen county. The sectors of the economy in which the workers are engaged are related to real estate and business activities, 25% circa, followed by transport and communications, and retail trade, both acquiring 10% circa of the total amount of commuters.
The final argument under the lens of the descriptive analysis sheds light on the relationship between wages and commuters, from both prospective of individuals working on the Danish and Swedish part of the Oresund region. The dualism Scania against Zealand in terms of average wages sees the dominance of earnings for commuters working in Sweden, compared to the ones

working in Denmark: in fact from 1997 when the average salary for Danish commuters reached slightly 200.000 Sek yearly, from the year 2000 till 2007 a continuous rise has achieved a peak point of 500.000 Sek yearly earned by Danish workers. On the other side Swedish commuters have experienced an overall stable path in terms of average salary, moved from 300.000 Sek to 350.000 Sek. This tendency might be explained by the fact that possibly Danish commuters, although in a smaller amount, are engaged in more remunerative job positions in Sweden compared to the colleagues working in Zealand.
For the Danish commuters, the most profitable areas are South and North West areas in Scania, with average wages reaching 500.000 Sek yearly, while North East does not offer more than 250.000 Sek for the Danish workers. Swedish commuters working in Roskilde county earn the highest average wages in Zealand, while Copenhagen City attracts commuters earning almost 400.000 Sek in the last year of estimation 2005.
As seen previously for gender distribution and commuting flows, the wages follow a similar tendency with salaries corresponded to the male commuters generally doubled compared to the ones for female workers: for commuters moving daily to Sweden the contrast is highly remarkable, with the gap between male and female retributions of almost 220.000 Sek; this fact might be explained by a lower female involvement in professional and more remunerative occupations contrasted with male workers. For commuters working in Zealand, Denmark, the discrepancy is less noticeable, with a gap around 150.000 Sek yearly between male and female individuals.
Finally taking a closer look at the relation between wages and sectors of industry, for Danish commuters the most remunerative sectors are manufacturing, retail trade and constructions, while Swedish commuters earn the highest retributions from sectors as real estate and business activities, constructions and water supply and energy industries.
After having presented the results of the investigation, the discussion for the “factors analysis” points briefly at the main findings of the influence due to the main aspects highlighted previously from the literature review.
The two methods give different parameters for reliability with the Generalized negative regression as the most reliable one: although the results are stable for all the two means of analysis, the present discussion will summarize the estimations from the Generalized Negative Binomial regression.
Among the main factors listed as economic ones, labor force, wage differences, employment and unemployment, the first two are the most influencing ones with a pushing influence for

commuters from Scania to Denmark thanks to the two factors; unemployment as well works as pushing strength with estimations close to labor and wage differences levels. Employment from the destination region offers instead lower influence for commuters decisions, almost ten times less compared to the other forces.

Education as well has an important impact on the commuters, since the estimations reach similar results as the previous most noticeable forces mentioned before.

Finally the distance, which has been presented by gravity models as one of the main elements for commuters estimations, proves its importance with high levels of influence especially with increased space between the origin and destination spot.

5.6 Conclusions

The current research has investigated into the phenomenon of commuting, describing the major characteristics and analyzing the main forces influencing the growing tendency before and after the introduction of the Oresund Bridge. From the theoretical view, the research had the purpose to combine academic knowledge regarding infrastructures and in the specific case transport infrastructure in boosting regional growth, and labor mobility and its implications, with focus on the commuting flows phenomenon. A robust literature review has served partly in providing evidence of the important feature of creating new infrastructures for both boosting economic growth, at a regional as well as national and transnational levels, and to enhance the phenomenon of labor mobility between different areas. With the descriptive and empirical results achieved thanks to the research, additional knowledge regarding the commuting phenomenon has been provided to the existing theoretical contribution; the assumptions regarding labor markets aspects, as employment, wage differences and so forth, are explained in the practical analysis as influencing forces for the commuting tendency, underlining remarkably the relation of these labor markets pilasters to the theory of the push and pull effect. Besides another important finding of the research is related to additional factors, embedded with demographic and geographic spheres, that influence the commuting trend: education, population density in different locations, distance between origin and destination points, are all factors that in negative or positive way contribute to the final decision of individuals in commuting for working opportunities. From the practical prospective, the research can provide some useful insights for future investigations: the commuting phenomenon in the last years growing with outstanding results needs to be followed with more and more attention by the subjects enrolled in the politic world, as well as in the economic one, for all the implications derived by it; for all the parts involved in the infrastructure project, the introduction of the Bridge had as one of the main purposes to connect culturally, territorially, economically two regions and Nations historically sharing numerous features, Sweden and Denmark. Concerning the economic prospective, the results produced by the analysis might provide important understandings for the regulations of a common labor market between the two Regions, improvement in the conditions for an integration of the two economic areas: knowing thanks to the empirical findings about the tendencies of labor features as unemployment and wage differences and their relation to commuting flows might be useful to boost and enhance reforms and decisions to take in order to achieve a continuous growth of the transnational region. Besides important findings related to gender division, commuters age could contribute to locate under spotlight segments of the labor force which experience more constraints in the process of working on the other side of the Bridge. In conclusion, the results of the analysis can prove the efficiency of the gravity model in explaining the influence of labor market factors in comparison to the commuting flows: labor force and wage differences from the origin regions are the driving factors influencing remarkably the daily movement of workers. Besides other labor market features as employment in the destination region, as well as unemployment, work as push and pulling forces as delineated in the theoretical framework used for the commuters argument. Finally some evidence sheds light on different factors as level of education from the origin region, housing prices from the destination and the origin regions, distances between the locations involved, as influencing forces for the commuting flow phenomenon; furthermore geographic features as population density, rural and urban areas, presence of railway facilities suggest that these elements as well can contribute to the increase of daily travelers for working reasons.

5.7 Future research

Some considerations can be taken into account for future contribution to the present research. Implementing the argument with gaining information from a qualitative approach, means of transportation used to commute, household composition, psychological factors pushing or slowing the decision of commuters are some of the integrative data which need to be collected for a more exhaustive research. Besides considering the commuting phenomenon analyzed with a longer time frame, as for instance from 2000 till 2010 and comparing the first five years to the second ones will certainly provide remarkable findings, important for future considerations and decision-makers.

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Appendix
Analysis year 1999.

Negative Binomial Poisson regression.

Model Information

Dependent Variable	Scaniacom
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

	N	Percent
Included	1844	100,0%
Excluded	0	,0%
Total	1844	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	230	12,5%
		Station	1614	87,5%
		Total	1844	100,0%
	City	Small	569	30,9%
		Big	1275	69,1%
		Total	1844	100,0%
	Medium	No medium	1521	82,5%
		Medium	323	17,5%
		Total	1844	100,0%
	Small	No small	1598	86,7%
		Small	246	13,3%
		Total	1844	100,0%
	Distance60	More	743	40,3%
		Within 60	1101	59,7%
		Total	1844	100,0%
	Distance100	More	1563	84,8%
		60-100	281	15,2%

	Total	1844	100,0%
Distance160	More	1382	74,9%
	100-160	462	25,1%
	Total	1844	100,0%

Continued table **Categorical Variable Information**

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Scaniacom	1844	1	1844	922,50	532,461
Covariate	Employ	1844	3,8008	5,4121	4,979159	,5335059
	Labour	1844	3,6210	5,2188	4,816547	,4812996
	Distance	1844	-2,2100	2,2700	-,955916	1,5214667
	Unemplo	1844	-,2631	,5731	,209344	,1664597
	Wagedi	1844	-,3507	,0168	-,118284	,0580177
	House	1844	2,5911	3,1793	3,060611	,1392591
	Housedk	1844	3,0980	3,5056	3,265226	,0577170
	Educatsw	1844	,0849	,3680	,209205	,0526626
	Pop.	1844	,5360	,9930	,935330	,0869821

Goodness of Fit[b]

	Value	df	Value/df
Deviance	6750,839	1829	3,691
Scaled Deviance	6750,839	1829	
Pearson Chi-Square	8691,408	1829	4,752
Scaled Pearson Chi-Square	8691,408	1829	
Log Likelihood[a]	-4243,815		
Akaike's Information Criterion (AIC)	16851,630		
Finite Sample Corrected AIC (AICC)	16851,893		
Bayesian Information Criterion (BIC)	16860,426		
Consistent AIC (CAIC)	16865,426		

Dependent Variable: Scaniacom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labou, distance, unemplo, wagedi, house, housedk, educatsw, pop. full log likelihood function is displayed and used in computing information criteria.

a. Information criteria are in small-is-better form.

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval Lower	Upper
(Intercept)	2,279	,0805	2,122	2,437
[train=0]	0[a]			
[train=1]	,328	,0054	,318	,338
[city=0]	0[a]			
[city=1]	,391	,0068	,384	,398
[medium=0]	0[a]			
[medium=1]	,907	,0044	,816	,998
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	1,208	,0035	1,201	1,215
[Distance60=1]	-,049	,0030	-,066	-,032
[Distance100=0]	-,009	,0030	-,015	-,003
[Distance100=1]	-1,208	,0035	-1,209	-1,207
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
Employ	,154	,0023	,151	,157
Labou	1,827	,0087	1,810	1,844
Distance	-,011	,0006	-,012	-,010
Unemplo	,367	,0143	,365	,369
Wagedi	-1,207	,0245	-1,255	-1,159
House	,008	,0136	-,019	,035
Housedk	,464	,0206	,404	,524
Educatsw	1,460	,0308	1,320	1,599
Popul.	-1,678	,0279	-1,732	-1,623
(Scale)	1[b]			

Dependent Variable: Scaniacom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labou, distance, Unemplo, wagedi, house, housedk, educatsw, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
503130,476	14	,000

Dependent Variable: Scaniacom Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labou, distance, unemplo, wagedi, house, housedk, educatsw, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	714,062	1	,000
Train	3760,088	1	,001
City	5459,292	1	,003
Medium	71726,881	1	,009
Small	.[a]	.	.
Distance60	56912,817	1	,009
Distance100	3529,88	1	,000
Distance160	.a	.	.
Employ	4314,378	1	,000
Labou	49796,993	1	,000
Distance	294,516	1	,000
Unemplo	666,979	1	,000
Wagedi	2417,634	1	,000
House	504,815	1	,024
Housedk	,362	1	,000
Educatsw	2263,689	1	,000
Pop.	3610,177	1	,000

Continued table **Tests of Model Effects**

Dependent Variable: Scaniacom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labou, distance, unemplo, wagedi, house, housedk, educatsw, pop.

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	Df	Sig.
(Intercept)	802,332	1	,000
[train=0]			
[train=1]	3708,651	1	,000
[city=0]			
[city=1]	3260,925	1	,000
[medium=0]			
[medium=1]	42607,130	1	,000
[small=0]			
[small=1]			
[Distance60=0]	171893,994	1	,000
[Distance60=1]	115880,167	1	,000
[Distance100=0]			
[Distance100=1]	274,923	1	,000
[Distance160=0]			
[Distance160=1]			
Employ	4327,318	1	,000
Labou	44568,798	1	,000
Distance	295,476	1	,000
Unemplo	661,820	1	,000
Wagedi	2437,866	1	,000
House	507,657	1	,040
Housedk	,362	1	,000
Educatsw	2247,728	1	,000
Population	3621,296	1	,000

Analysis year 1999.
Generalized Negative Binomial regression.

Model Information

Dependent Variable	Scaniacom
Probability Distribution	Negative binomial (1)
Link Function	Log

Case Processing Summary

	N	Percent
Included	1844	100,0%
Excluded	0	,0%
Total	1844	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	230	12,5%
		Station	1614	87,5%
		Total	1844	100,0%
	City	Small	569	30,9%
		Medium	1275	69,1%
		Total	1844	100,0%
	Medium	No medium	1521	82,5%
		Medium	323	17,5%
		Total	1844	100,0%
	Small	No small	1598	86,7%
		Small	246	13,3%
		Total	1844	100,0%
	Distance60	More	743	40,3%
		Within 60	1101	59,7%
		Total	1844	100,0%
	Distance100	More	1563	84,8%
		60-100	281	15,2%
		Total	1844	100,0%
	Distance160	More	1382	74,9%
		100-160	462	25,1%

	Total	1844	100,0%

continued Categorical variables Information

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Scaniacom	1844	1	1844	922,50	532,461
Covariate	Employ	1844	3,8008	5,4121	4,979159	,5335059
	Labou	1844	3,6210	5,2188	4,816547	,4812996
	Distance	1844	-2,2100	2,2700	-,955916	1,5214667
	Unemplo	1844	-,2631	,5731	,209344	,1664597
	Wagedi	1844	-,3507	,0168	-,118284	,0580177
	House	1844	2,5911	3,1793	3,060611	,1392591
	Housedk	1844	3,0980	3,5056	3,265226	,0577170
	Educatsw	1844	,0849	,3680	,209205	,0526626
	Pop.	1844	,5360	,9930	,935330	,0869821

Goodness of Fit[b]

	Value	Df	Value/df
Deviance	2224,064	1829	1,216
Scaled Deviance	2224,064	1829	
Pearson Chi-Square	2141,759	1829	1,171
Scaled Pearson Chi-Square	2141,759	1829	
Log Likelihood[a]	-4072,461		
Akaike's Information Criterion (AIC)	2817,921		
Finite Sample Corrected AIC (AICC)	2817,184		
Bayesian Information Criterion (BIC)	2825,717		
Consistent AIC (CAIC)	2827,717		

Dependent Variable: Scaniacom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labou, distance, unemplo, wagedi, house, housedk, educatsw, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

Goodness of Fit[b]

	Value	Df	Value/df
Deviance	2224,064	1829	1,216
Scaled Deviance	2224,064	1829	
Pearson Chi-Square	2141,759	1829	1,171
Scaled Pearson Chi-Square	2141,759	1829	
Log Likelihood[a]	-4072,461		
Akaike's Information Criterion (AIC)	2817,921		
Finite Sample Corrected AIC (AICC)	2817,184		
Bayesian Information Criterion (BIC)	2825,717		
Consistent AIC (CAIC)	2827,717		

Dependent Variable: Scaniacom
Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labou, distance, unemplo, wagedi, house, housedk, educatsw, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
723,375	14	,000

Dependent Variable: Scaniacom Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labou, distance, unemplo, wagedi, house, housedk, educatsw, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	3,339	1	,000
Train	1,351	1	,045
City	1,525	1	,001
Medium	5,818	1	,004
Small	.[a]		
Distance60	4,991	1	,000
Distance100	3,133	1	,005
Distance160	.[a]		
Employ	1,710	1	,000
Labou	84,127	1	,000
Distance	1,135	1	,000
Unemplo	,145	1	,004
Wagedi	5,161	1	,003
House	10,013	1	,022
Housedk	,029	1	,000
Educatsw	,156	1	,000
Pop.	1,006	1	,000

Dependent Variable: Scaniacom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labou, distance, unemplo, wagedi, house, housedk, educatsw, pop.

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval Lower	95% Wald Confidence Interval Upper
(Intercept)	3,792	2,2035	-,526	8,111
[train=0]	0[a]			
[train=1]	,328	,0054	,318	,338
[city=0]	0[a]			
[city=1]	,391	,0068	,300	,482

[medium=0]	0[a]			
[medium=1]	,907	,0044	,888	,926
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			
[Distance60=1]	-,049	,0030	-,089	-,009
[Distance100=0]	0[a]			
[Distance100=1]	-1,208	,0035	-1,388	-,668
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
Employ	,154	,0023	,045	,263
Labou	1,827	,0087	1,325	2,329
Distance	-,011	,0006	-,018	-,004
Unemplo	,367	,0143	,322	,412
Wagedi	-1,207	,0245	-1,455	-,954
House	,008	,0136	,007	,009
Housedk	,464	,0206	,404	,524
Educatsw	1,460	,0308	1,164	1,756
Pop.	-1,678	,0279	-1,705	-1,651
(Scale)	1[b]			
(Negative binomial)	1			

Continued Parameters estimates
Dependent Variable: Scaniacom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labou, distance, unemplo, wagedi, house, housedk, educatsw, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	Df	Sig.
(Intercept)	2,962	1	,000
[train=0]			
[train=1]	,328	1	,044
[city=0]			
[city=1]	2,952	1	,000

medium=0]			
[medium=1]	44,215	1	,000
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	194,921	1	,000
[Distance100=0]			
[Distance100=1]	,030	1	,000
[Distance160=0]			
[Distance160=1]			
Employ	1,708	1	, 000
Labou	81,502	1	,000
Distance	1,130	1	, 000
Unemplo	,144	1	,000
Wagedi	5,079	1	, 000
House	10,072	1	,022
Housedk	,029	1	, 000
Educatsw	,156	1	,000
Pop.	1,020	1	,000

Continued Parameters estimates

Analysis year 2000.

Negative Binomial Poisson regression.

Model Information

Dependent Variable	Scanecom
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

	N	Percent
Included	2279	100,0%
Excluded	0	,0%
Total	2279	100,0%

Categorical Variable Information

			N	Percent
Factor	train	No station	264	11,6%
		Station	2015	88,4%
		Total	2279	100,0%
	city	Small	666	29,2%
		Big	1613	70,8%
		Total	2279	100,0%
	medium	No medium	1902	83,5%
		Medium	377	16,5%
		Total	2279	100,0%
	small	No small	1990	87,3%
		Small	289	12,7%
		Total	2279	100,0%
	Distance60	More	814	35,7%
		Within 60	1465	64,3%
		Total	2279	100,0%
	Distance100	More	1926	84,5%
		60-100	353	15,5%
		Total	2279	100,0%
	Distance160	More/less	1818	79,8%
		100-160	461	20,2%
		Total	2279	100,0%

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Scanecom	2279	1	2279	1140,00	658,035
Covariate	Employ	2279	3,7957	5,4206	4,943277	,5482010
	Labour	2279	3,6160	5,2251	4,852571	,4753243
	Distance	2279	-2,24	2,20	-1,0198	1,46166
	Unemplo	2279	-,2438	,5325	,195976	,1649266

	Wagedi	2279	-,3572	,0246	-,117934	,0583304
	House	2279	2,5866	3,2315	3,120004	,1449155
	Housedk	2279	3,1623	3,5184	3,301118	,0503459
	Educaswe	2279	,0970	,4845	,247795	,0717715
	Pop.	2279	,5340	,9930	,940180	,0853119

Continued **Continuous Variable Information**

Goodness of Fit[b]

	Value	df	Value/df
Deviance	17167,912	2264	7,583
Scaled Deviance	17167,912	2264	
Pearson Chi-Square	23830,864	2264	10,526
Scaled Pearson Chi-Square	23830,864	2264	
Log Likelihood[a]	-11552,270		
Akaike's Information Criterion (AIC)	26313,541		
Finite Sample Corrected AIC (AICC)	26313,753		
Bayesian Information Criterion (BIC)	26322,513		
Consistent AIC (CAIC)	26323,513		

Dependent Variable: scanecom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labour, distance, unemplo, wagedi, house, housedk, educaswe, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
758908,929	14	,000

Dependent Variable: scanecom Model:
(Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labour, distance, unemplo, wagedi, house, housedk, educaswe, pop.
a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	Df	Sig.
(Intercept)	609,781	1	,000
train	9441,963	1	,000
city	77261,737	1	,000
medium	4588,281	1	,000
small	.[a]	.	
Distance60	66328,929	1	,000
Distance100	7472,17	1	,000
Distance160	.[a]	.	.
employ	10227,901	1	,000
labour	81069,286	1	,000
distance	5023,058	1	,000
unemplo	105,245	1	,000
wagedi	1182,287	1	,000
house	11221,953	1	,017
housedk	4,712	1	,003
educaswe	19263,302	1	,000
pop.	22969,385	1	,000

Dependent Variable: scanecom
Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labour, distance, unemplo, wagedi, house, housedk, educaswe, pop.
a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval Lower	Upper
(Intercept)	-1,345	,0644	-1,471	-1,219
[train=0]	0[a]			
[train=1]	,431	,0472	,429	,433
[city=0]	0[a]			
[city=1]	,155	,0658	,147	,163
[medium=0]	0[a]			
[medium=1]	,739	,0400	,726	,752
[small=0]	0[a]	.	.	.
[small=1]	0[a]	.	.	.
[Distance60=0]	0[a]			
[Distance60=1]	-,261	,0283	-,266	-,256
[Distance100=0]	0[a]			
[Distance100=1]	-1,252	,0029	-1,287	-1,228
[Distance160=0]	0[a]	.	.	.
[Distance160=1]	0[a]	.	.	.
employ	,181	,0187	,174	,188
labour	1,736	,0682	1,723	1,749
distance	-,036	,0053	-,055	-,027
unemplo	,062	,0631	,053	,069
wagedi	-,618	,1883	-,653	-,583
house	,027	,1327	,012	,052
housedk	1,548	,0149	1,519	1,578
educaswe	1,882	,1435	1,709	2,055
Pop.	-1,349	,2356	-1,693	-1,005
(Scale)	1[b]			

Dependent Variable: scanecom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labour, distance, unemplo, wagedi, house, housedk, educaswe, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	436,989	1	,000
[train=0]			
[train=1]	9198,808	1	,000
[city=0]			
[city=1]	614,141	1	,000
[medium=0]			
[medium=1]	37776,652	1	,000
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	186747,595	1	,000
[Distance100=0]			
[Distance100=1]	9407,690	1	,000
[Distance160=0]			
[Distance160=1]			
employ	10355,760	1	,000
labour	71519,054	1	,000
distance	5034,966	1	,000
unemplo	105,240	1	,000
wagedi	1191,506	1	,000
house	10754,208	1	,044
housedk	4,708	1	,000
educaswe	19007,607	1	,000
pop.	22335,824	1	,000

Analysis Year 2000.

Generalized Negative Binomial regression.

Model Information

Dependent Variable	Scanecom
Probability Distribution	Negative binomial (1)
Link Function	Log

Case Processing Summary

	N	Percent
Included	2279	100,0%
Excluded	0	,0%
Total	2279	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	264	11,6%
		Station	2015	88,4%
		Total	2279	100,0%
	City	Small	666	29,2%
		Big	1613	70,8%
		Total	2279	100,0%
	Medium	No medium	1902	83,5%
		medium	377	16,5%
		Total	2279	100,0%
	Small	No small	1990	87,3%
		Small	289	12,7%
		Total	2279	100,0%
	Distance60	More	814	35,7%
		Within 60	1465	64,3%
		Total	2279	100,0%
	Distance100	More	1926	84,5%
		60-100	353	15,5%
		Total	2279	100,0%
	Distance160	More/Less	1818	79,8%
		100-160	461	20,2%
		Total	2279	100,0%

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Scanecom	2279	1	2279	1140,00	658,035
Covariate	Employ	2279	3,7957	5,4206	4,943277	,5482010
	Labour	2279	3,6160	5,2251	4,852571	,4753243
	Distance	2279	-2,24	2,20	-1,0198	1,46166
	Unemplo	2279	-,2438	,5325	,195976	,1649266
	Wagedi	2279	-,3572	,0246	-,117934	,0583304
	House	2279	2,5866	3,2315	3,120004	,1449155
	Housedk	2279	3,1623	3,5184	3,301118	,0503459
	educaswe	2279	,0970	,4845	,247795	,0717715
	Pop.	2279	,5340	,9930	,940180	,0853119

Goodness of Fit[b]

	Value	df	Value/df
Deviance	2755,288	2264	1,217
Scaled Deviance	2755,288	2264	
Pearson Chi-Square	2705,48	2264	1,195
Scaled Pearson Chi-Square	2705,48	2264	
Log Likelihood[a]	-7873,930		
Akaike's Information Criterion (AIC)	3577,860		
Finite Sample Corrected AIC (AICC)	3577,073		
Bayesian Information Criterion (BIC)	3586,833		
Consistent AIC (CAIC)	3587,833		

Dependent Variable: scanecom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labour, distance, unemplo, wagedi, house, housedk, educaswe, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
894,913	14	,000

Dependent Variable: scanecom Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labour, distance, unemplo, wagedi, house, housedk, educaswe, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	,941	1	,000
train	8,056	1	,005
city	7,565	1	,050
medium	4,274	1	,061
small	.a	.	.
Distance60	112,636	1	,009
Distance100	8,911	1	,004
Distance160	.a	.	.
employ	6,901	1	,009
labour	141,481	1	,000
distance	3,959	1	,007
unemplo	5,458	1	,009
wagedi	7,035	1	,008
house	4,227	1	,040
housedk	1,173	1	,009
educaswe	,692	1	,006
pop.	6,076	1	,014

Dependent Variable: scanecom
Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labour, distance, unemplo, wagedi, house, housedk, educaswe, pop.
a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter			95% Wald Confidence Interval	
	B	Std. Error	Lower	Upper
(Intercept)	-2,833	1,9844	-6,722	1,057
[train=0]	0[a]			
[train=1]	,310	,1082	,222	,398
[city=0]	0[a]			
[city=1]	-,373	,1583	-,383	-,363
[medium=0]	0[a]			
[medium=1]	,179	,0956	,166	,192
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			
[Distance60=1]	-,057	,0843	-,061	-,053
[Distance100=0]	0[a]			
[Distance100=1]	-1,587	,0933	-1,605	-1,370
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
Employ	,162	,0619	,083	,241
Labour	2,085	,1702	1,751	2,419
Distance	-,036	,0183	-,070	-,002
Unemplo	,576	,2468	,555	,597
Wagedi	-1,852	,7070	-3,238	-,466
House	,504	,4624	,306	,702
Housedk	,984	,4736	,056	1,912
Educaswe	,406	,4865	,359	,453
Pop	-1,552	,6303	-2,787	-,316
(Scale)	1[b]			

(Negative binomial)	1				

Continued **Parameters estimates**
Dependent Variable: scanecom

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labour, distance, unemplo, wagedi, house, housedk, educaswe, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	2,038	1	,000
[train=0]			
[train=1]	8,230	1	,000
[city=0]			
[city=1]	5,565	1	,063
[medium=0]			
[medium=1]	3,488	1	,052
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	289,339	1	,000
[Distance100=0]			
[Distance100=1]	,458	1	,008
[Distance160=0]			
[Distance160=1]			
employ	6,837	1	,004
labour	150,035	1	,000
distance	3,934	1	,004
unemplo	5,437	1	,000
wagedi	6,862	1	,000
house	4,318	1	,018
housedk	1,189	1	,000
educaswe	,697	1	,004
Pop.	6,061	1	,014

Analysis Year 2001.

Negative Binomial Poisson regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

	N	Percent
Included	3032	100,0%
Excluded	0	,0%
Total	3032	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	369	12,2%
		station	2663	87,8%
		Total	3032	100,0%
	City	No big	797	26,3%
		Big	2235	73,7%
		Total	3032	100,0%
	Medium	No medium	2586	85,3%
		medium	446	14,7%
		Total	3032	100,0%
	Small	No small	2681	88,4%
		Small	351	11,6%
		Total	3032	100,0%
	Distance60	More	996	32,8%
		Within 60	2036	67,2%
		Total	3032	100,0%

Distance100	More	2548	84,0%
	100-160	484	16,0%
	Total	3032	100,0%
Distance160	More/less	2520	83,1%
	160	512	16,9%
	Total	3032	100,0%

Continued **Categorical Variable Information**

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	scancomm	3032	1	3032	1516,50	875,407
Covariate	Employ	3032	3,7929	5,4258	4,911300	,5530402
	Labour	3032	3,4561	5,0130	4,682389	,4450098
	Distance	3032	-2,2553	2,2302	-1,324383	1,1727267
	unemploy	3032	-,2986	,4673	,142538	,1673689
	Wagedif	3032	-,3857	-,0268	-,164736	,0514227
	House	3032	2,6222	3,2632	3,172546	,1514397
	Housedk	3032	3,2183	3,5990	3,373115	,0588114
	educatswe	3032	,0986	,4913	,256947	,0709044
	pop.	3032	,5390	,9980	,946659	,0864507

Goodness of Fit[b]

	Value	df	Value/df
Deviance	47517,08	3016	15,755
Scaled Deviance	47517,08	3016	
Pearson Chi-Square	52074,256	3016	17,266
Scaled Pearson Chi-Square	52074,256	3016	
Log Likelihood[a]	-20129,287		
Akaike's Information Criterion (AIC)	40879,709		
Finite Sample Corrected AIC (AICC)	40879,889		
Bayesian Information	40888,980		

Criterion (BIC)			
Consistent AIC (CAIC)	40890,980		

Continued **Goodness of fit**
Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemploy, wagedif, house, housedk, educatswe, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
1392772,188	15	,000

Dependent Variable: scancomm Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemploy, wagedif, house, housedk, educatswe, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	Df	Sig.
(Intercept)	75,804	1	,000
Train	22935,332	2	,000
City	52661,821	1	,000
Medium	34599,162	1	,000
Small	.[a]	.	
Distance60	26384,276	1	,000
Distance100	19283,742	1	,000
Distance160	.[a]		

Employ	20253,707	1	,000
Labour	71218,998	1	,000
Distance	,206	1	,040
Unemploy	18817,543	1	,000
Wagedif	22006,752	1	,000
House	3047,761	1	,000
Housedk	6099,106	1	,000
Educatswe	65,210	1	,000
pop.	2887,412	1	,000

Continued **Tests of model effects**
Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemploy, wagedif, house, housedk, educatswe, pop.

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter			95% Wald Confidence Interval	
	B	Std. Error	Lower	Upper
(Intercept)	-,660	,0516	-,762	-,559
[train=0]	,184	,0146	,155	,212
[train=1]	,412	, 0372	,317	,778
[city=0]	0[a]			
[city=1]	,518	,0617	,415	,621
[medium=0]	0[a]			
[medium=1]	1,009	,0400	,196	1,822
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			
[Distance60=1]	-,104	,0241	-,106	-,102
[Distance100=0]	0[a]			
[Distance100=1]	-1,366	,0358	-1,455	-1,277
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
Employ	,193	,0159	,190	,196
Labour	2,034	,0892	1,920	2,148
Distance	-,006	,0049	-,011	-,001

Unemploy	1,753	,1411	1,643	1,863
Wagedif	-3,225	,2463	-3,359	-3,077
House	,755	,1085	,679	,831
Housedk	1,705	,1560	,732	2,678
Educatswe	1,503	,2181	,565	2,441
Pop.	-1,762	,2150	-1,833	-1,691
(Scale)	1[b]			

Continued **Parameter Estimates**

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, employ, labour, distance, unemploy, wagedif, house, housedk, educatswe, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	163,902	1	,000
[train=0]	158,281	1	,000
[train=1]	2298,537	1	,000
[city=0]			
[city=1]	5630,547	1	,000
[medium=0]			
[medium=1]	41378,252	1	,000
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	215085,870	1	,000
[Distance100=0]			
[Distance100=1]	8138,566	1	,000
[Distance160=0]			
[Distance160=1]			
Employ	20283,813	1	,000
Labour	65118,208	1	,000
Distance	,206	1	,022
Unemploy	18304,060	1	,000

Wagedif	22348,966	1	,000
House	2985,640	1	,000
Housedk	6001,375	1	,000
Educatswe	64,904	1	,000
pop.	2889,037	1	,000

Continued Parameters estimates

Analysis Year 2001.

Generalized Negative Binomial regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Negative binomial (1)
Link Function	Log

Case Processing Summary

	N	Percent
Included	3032	100,0%
Excluded	0	,0%
Total	3032	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	369	12,2%
		Station	2663	87,8%
		Total	3032	100,0%
	City	No big	797	26,3%
		Big	2235	73,7%
		Total	3032	100,0%
	Medium	No medium	2586	85,3%
		Medium	446	14,7%
		Total	3032	100,0%
	Small	No small	2681	88,4%
		Small	351	11,6%

		N	Percent
	Total	3032	100,0%
Distance60	More	996	32,8%
	Within 60	2036	67,2%
	Total	3032	100,0%
Distance100	More	2548	84,0%
	60-100	484	16,0%
	Total	3032	100,0%
Distance160	Morel/less	2520	83,1%
	100-160	512	16,9%
	Total	3032	100,0%

Continued Categorical Variable Information

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	scancomm	3032	1	3032	1516,50	875,407
Covariate	Employ	3032	3,7929	5,4258	4,911300	,5530402
	Labour	3032	3,4561	5,0130	4,682389	,4450098
	distance	3032	-2,2553	2,2302	-1,324383	1,1727267
	unemploy	3032	-,2986	,4673	,142538	,1673689
	wagedif	3032	-,3857	-,0268	-,164736	,0514227
	House	3032	2,6222	3,2632	3,172546	,1514397
	housedk	3032	3,2183	3,5990	3,373115	,0588114
	educatswe	3032	,0986	,4913	,256947	,0709044
	pop.	3032	,5390	,9980	,946659	,0864507

Goodness of Fit[b]

	Value	df	Value/df
Deviance	3878,576	3016	1,286
Scaled Deviance	3878,576	3016	
Pearson Chi-Square	3575,936	3016	1,246
Scaled Pearson Chi-Square	3575,936	3016	
Log Likelihood[a]	-14639,931		

Akaike's Information Criterion (AIC)	39225,342		
Finite Sample Corrected AIC (AICC)	39225,523		
Bayesian Information Criterion (BIC)	39321,614		
Consistent AIC (CAIC)	39337,614		

Continued **goodness of fit**
Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemploy, wagedif, house, housedk, educatswe, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
1286,365	15	,000

Dependent Variable: scancomm Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemploy, wagedif, house, housedk, educatswe, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	,247	1	,000
Train	86,577	2	,000
City	26,421	1	,000
Medium	7,928	1	,000
Small	.[a]		
Distance60	54,291	1	,000
Distance100	2,928	1	,000
Distance160	.[a]		

Employ	8,100	1	,004
Labour	86,283	1	,000
Distance	,001	1	,001
Unemploy	13,009	1	,000
Wagedif	21,557	1	,000
House	1,094	1	,003
Housedk	5,856	1	,006
educatswe	26,794	1	,020
pop.	1,176	1	,018

Continued **Tests of Model Effects**

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemploy, wagedif, house, housedk, educatswe, pop.

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter			95% Wald Confidence Interval	
	B	Std. Error	Lower	Upper
(Intercept)	-3,608	2,0485	-7,623	,407
[train=0]	,187	,0149	-,570	,804
[train=1]	,021	, 0391	,010	,032
[city=0]	,269	,2009	,125	,413
[city=1]	-,319	,0863	.-,555	-,083
[medium=0]	0[a]			
[medium=1]	-,060	,0497	-,084	-,036
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			
[Distance60=1]	-,196	,0351	.-,222	-,170
[Distance100=0]				
[Distance100=1]	-1,795	,0507	-1,815	-1,775
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
emplo	,200	,0253	,178	,222
labour	2,618	,1107	1,863	3,373

distance	-,010	,0081	-,016	-,004
unemploy	1,763	,1943	1,463	2,063
wagedif	-3,594	,3910	-4,896	-2,292
house	,934	,1701	,555	1,313
housedk	1,333	,2022	,711	1,955
educatswe	2,835	,2848	,774	4,896
Pop.	-,092	,2800	-,140	-,044
(Scale)	1[b]			
(Negative binomial)	1			

Continued **Parameter Estimates**

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemploy, wagedif, house, housedk, educatswe, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	3,102	1	,000
[train=0]	48,224	1	,000
[train=1]	69,777	1	,000
[city=0]			
[city=1]	1,794	1	,000
[medium=0]			
[medium=1]	,281	1	,000
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	248,916	1	,000
[Distance100=0]			
[Distance100=1]	37,079	1	,000
[Distance160=0]	.	.	.
[Distance160=1]	.	.	.
emplo	8,127	1	,000
Labour	88,436	1	,000

Distance	,001	1	,000
Unemploy	13,178	1	,000
Wagedif	20,842	1	,000
House	1,084	1	,000
Housedk	5,978	1	,000
Educatswe	25,074	1	,013
Pop.	1,176	1	,032

Continued Parameter estimates

Analysis Year 2002.

Negative Binomial Poisson regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

	N	Percent
Included	3855	100,0%
Excluded	0	,0%
Total	3855	100,0%

Categorical Variable Information

			N	Percent
Factor	train	No station	368	9,5%
		Station	3487	90,5%
		Total	3855	100,0%
	city	Small	1262	32,7%
		Big	2593	67,3%
		Total	3855	100,0%
	medium	No medium	3066	79,5%

	Medium	789	20,5%
	Total	3855	100,0%
small	No small	3382	87,7%
	Small	473	12,3%
	Total	3855	100,0%
Distance60	More	1157	30,0%
	Within 60	2698	70,0%
	Total	3855	100,0%
Distance100	More	3226	83,7%
	60-100	629	16,3%
	Total	3855	100,0%
Distance160	More/less	3327	86,3%
	100-160	528	13,7%
	Total	3855	100,0%

continued **Categorical Variable Information**

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Scancomm	3855	1	3855	1928,00	1112,987
Covariate	Employ	3855	3,7886	5,4145	4,907842	,5477228
	Labour	3855	3,4544	5,0151	4,698152	,4441636
	Distance	3855	-2,2742	4,2984	-,899634	1,4662268
	Unemplo	3855	-,3678	,4398	,092462	,1673753
	Wagedi	3855	-,3825	-,0242	-,166692	,0543668
	House	3855	2,6314	3,3051	3,195506	,1456705
	Housedk	3855	3,2679	3,6376	3,396937	,0533977
	Educationswe	3855	,1021	,5002	,266999	,0704266
	Pop.	3855	,5380	,9970	,947192	,0881181

Goodness of Fit[b]

	Value	df	Value/df
Deviance	82964,629	3839	21,611

Scaled Deviance	82964,629	3839	
Pearson Chi-Square	92754,079	3839	24,161
Scaled Pearson Chi-Square	92754,079	3839	
Log Likelihood[a]	-32735,463		
Akaike's Information Criterion (AIC)	63527,146		
Finite Sample Corrected AIC (AICC)	63527,288		
Bayesian Information Criterion (BIC)	63537,260		
Consistent AIC (CAIC)	63539,260		

Continued Goodness of Fit

Dependent Variable: scancomm
Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
2269009,141	15	,000

Dependent Variable: scancomm Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	45728,026	1	,000
train	28675,459	2	,000

city	38291,742	1	,000
medium	299372,258	1	,000
small	.[a]		
Distance60	52194,212	1	,000
Distance100	47322,495	1	,000
Distance160	.[a]		
emplo	120336,756	1	,000
labour	46814,552	1	,000
distance	989,710	1	,000
unemplo	1888,507	1	,000
wagedi	5016,397	1	,000
house	5254,444	1	,000
housedk	982,323	1	,000
educationswe	19895,468	1	,000
pop.	1113,611	1	,000

Continued Tests of Model Effects

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter			95% Wald Confidence Interval	
	B	Std. Error	Lower	Upper
(Intercept)	7,784	,0332	7,719	7,849
[train=0]	0[a]			
[train=1]	,267	,0033	-,111	,288
[city=0]	0[a]			
[city=1]	,522	,0036	,488	,556
[medium=0]	0[a]			
[medium=1]	1,312	,0028	1,188	1,436
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			

[Distance60=1]	-,072	,0023	-,080	-,064
[Distance100=0]	0[a]			
[Distance100=1]	-1,096	,0024	-1,224	-,968
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
emplo	,318	,0009	,313	,323
labour	,980	,0052	,754	1,206
distance	-,019	,0004	-,024	-,014
unemplo	,363	,0089	,305	,421
wagedi	-1,065	,0143	-1,157	-,973
house	,238	,0075	,190	,286
housedk	,427	,0101	,248	,606
educationswe	1,536	,0123	,772	2,300
Pop.	-,267	,0154	-,508	-,026
(Scale)	1[b]			

Continued **Parameter Estimates**

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	55060,311	1	,000
[train=0]			
[train=1]	2157,991	1	,000
[city=0]			
[city=1]	133152,783	1	,000
[medium=0]			
[medium=1]	169666,909	1	,000
[small=0]			
[small=1]			
[Distance60=0]			

[Distance60=1]	190187,999	1	,000
[Distance100=0]			
[Distance100=1]	7612,252	1	,000
[Distance160=0]			
[Distance160=1]			
emplo	121729,494	1	,000
labour	45939,557	1	,000
distance	984,132	1	,000
unemplo	1873,797	1	,000
wagedi	5059,889	1	,000
house	5261,859	1	,000
housedk	973,867	1	,000
educationswe	19661,229	1	,000
Pop.	1121,733	1	,000

Continued **Parameters estimates**

Analysis Year 2002.
Generalized Negative Binomial regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Negative binomial (1)
Link Function	Log

Case Processing Summary

	N	Percent
Included	3855	100,0%
Excluded	0	,0%
Total	3855	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	368	9,5%
		Station	3487	90,5%
		Total	3855	100,0%

City	Small	1262	32,7%
	Big	2593	67,3%
	Total	3855	100,0%
Medium	No medium	3066	79,5%
	Medium	789	20,5%
	Total	3855	100,0%
Small	No small	3382	87,7%
	Small	473	12,3%
	Total	3855	100,0%
Distance60	More	1157	30,0%
	Within 60	2698	70,0%
	Total	3855	100,0%
Distance100	More	3226	83,7%
	60-100	629	16,3%
	Total	3855	100,0%
Distance160	More/less	3327	86,3%
	100-160	528	13,7%
	Total	3855	100,0%

continued **categorical variables information**

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Scancomm	3855	1	3855	1928,00	1112,987
Covariate	Employ	3855	3,7886	5,4145	4,907842	,5477228
	Labour	3855	3,4544	5,0151	4,698152	,4441636
	Distance	3855	-2,2742	4,2984	-,899634	1,4662268
	Unemplo	3855	-,3678	,4398	,092462	,1673753
	Wagedi	3855	-,3825	-,0242	-,166692	,0543668
	House	3855	2,6314	3,3051	3,195506	,1456705
	Housedk	3855	3,2679	3,6376	3,396937	,0533977
	Educationswe	3855	,1021	,5002	,266999	,0704266
	Pop.	3855	,5380	,9970	,947192	,0881181

Goodness of Fit[b]

	Value	Df	Value/df
Deviance	8488,029	3839	2,211
Scaled Deviance	8488,029	3839	
Pearson Chi-Square	6825,742	3839	1,778
Scaled Pearson Chi-Square	6825,742	3839	
Log Likelihood[a]	-32254,114		
Akaike's Information Criterion (AIC)	64523,259		
Finite Sample Corrected AIC (AICC)	64523,401		
Bayesian Information Criterion (BIC)	64623,373		
Consistent AIC (CAIC)	64639,373		

Continued Continuous Variable Information
Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
1541,019	15	,000

Dependent Variable: scancomm Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	Df	Sig.
(Intercept)	6,992	1	,000
train	20,034	2	,044
city	18,219	1	,000
medium	5,8112	1	,000
small	.[a]		
Distance60	,321	1	,000
Distance100	41,954	1	,000
Distance160	.[a]		
emplo	57,773	1	,000
labour	53,715	1	,000
distance	4,692	1	,000
unemplo	,023	1	,000
wagedi	,994	1	,009
house	,414	1	,041
housedk	,289	1	,000
educationswe	1,694	1	,000
pop.	1,210	1	,011

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter			95% Wald Confidence Interval	
	B	Std. Error	Lower	Upper
(Intercept)	3,589	1,5470	,557	6,621
[train=0]	0[a]			
[train=1]	,167	,0946	,117	,217
[city=0]	0[a]			
[city=1]	,731	,1446	,515	,947

[medium=0]	0[a]			
[medium=1]	,480	,0959	,345	,615
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	-,065	,0866	-,101	-,029
[Distance60=1]	0[a]			
[Distance100=0]	-,201	,0919	-,381	-,021
[Distance100=1]	-1,324	,1065	-1,817	-,831
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
emplo	,330	,0437	,216	,444
labour	1,271	,1904	1,049	1,493
distance	-,033	,0160	-,043	-,023
unemplo	,092	,3858	,011	,103
wagedi	-,513	,7081	-,577	-,449
house	,134	,3486	,064	,170
housedk	,205	,4246	,169	,241
educationswe	,407	,5853	,318	,496
Pop.	-,006	,5055	-,007	-,005
(Scale)	1[b]			
(Negative binomial)	1			

Continued **Parameters estimates**
Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	5,381	1	,000
[train=0]			
[train=1]	,819	1	,045
[city=0]			
[city=1]	15,911	1	,000

[medium=0]			
[medium=1]	12,473	1	,000
[small=0]	.	.	.
[small=1]	.	.	.
[Distance60=0]			
[Distance60=1]	156,509	1	,000
[Distance100=0]			
[Distance100=1]	4,774	1	,009
[Distance160=0]	.	.	.
[Distance160=1]	.	.	.
emplo	57,474	1	,000
labour	54,828	1	,000
distance	4,637	1	,001
unemplo	,023	1	,000
wagedi	,987	1	,001
house	,413	1	,020
housedk	,291	1	,000
educationswe	1,699	1	,001
pop.	1,206	1	,012

Continued **Parameters estimates**

Analysis Year 2003.

Negative Binomial Poisson regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

	N	Percent
Included	3855	100,0%
Excluded	0	,0%
Total	3855	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	368	9,5%
		Station	3487	90,5%
		Total	3855	100,0%
	City	Small	1262	32,7%
		Big	2593	67,3%
		Total	3855	100,0%
	medium	No medium	3066	79,5%
		Medium	789	20,5%
		Total	3855	100,0%
	Small	No small	3382	87,7%
		Small	473	12,3%
		Total	3855	100,0%
	Distance60	More	1157	30,0%
		Within 60	2698	70,0%
		Total	3855	100,0%
	Distance100	More	3226	83,7%
		60-100	629	16,3%
		Total	3855	100,0%
	Distance160	More/less	3327	86,3%
		100-160	528	13,7%
		Total	3855	100,0%

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Scancomm	3855	1	3855	1928,00	1112,987
Covariate	Employ	3855	3,7886	5,4145	4,907842	,5477228
	Labour	3855	3,4544	5,0151	4,698152	,4441636
	Distance	3855	-2,2742	4,2984	-,899634	1,4662268
	Unemplo	3855	-,3678	,4398	,092462	,1673753
	Wagedi	3855	-,3825	-,0242	-,166692	,0543668
	House	3855	2,6314	3,3051	3,195506	,1456705

	Housedk	3855	3,2679	3,6376	3,396937	,0533977
	Educationswe	3855	,1021	,5002	,266999	,0704266
	pop.	3855	,5380	,9970	,947192	,0881181

Continued Continuos variables information

Goodness of Fit[b]

	Value	Df	Value/df
Deviance	104693,369	3839	27,271
Scaled Deviance	104693,369	3839	
Pearson Chi-Square	114624,862	3839	29,857
Scaled Pearson Chi-Square	114624,862	3839	
Log Likelihood[a]	-44966,033		
Akaike's Information Criterion (AIC)	63527,146		
Finite Sample Corrected AIC (AICC)	63527,288		
Bayesian Information Criterion (BIC)	63537,260		
Consistent AIC (CAIC)	63539,260		

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
2269009,141	15	,000

Dependent Variable: scancomm Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Compares

the fitted
model
against the
intercept-
only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	Df	Sig.
(Intercept)	45728,026	1	,000
Train	28675,459	2	,051
City	31493,231	1	,097
Medium	754924,853	1	,000
Small	.a	.	,000
Distance60	43261,295	1	,000
Distance100	38471,563	1	,000
Distance160	.a	.	.
Employ	120336,756	1	,000
Labour	46814,552	1	,000
Distance	989,710	1	,000
Unemplo	1888,507	1	,000
Wagedi	5016,397	1	,000
House	5254,444	1	,000
housedk	982,323	1	,000
educationswe	19895,468	1	,000
Pop.	1113,611	1	,000

Dependent Variable: scancomm
Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.
a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval Lower	Upper
(Intercept)	7,784	,0332	7,719	7,849
[train=0]	0[a]			
[train=1]	,934	,0031	,717	1,151
[city=0]	0[a]			
[city=1]	,910	,0032	,655	1,165
[medium=0]	0[a]			
[medium=1]	1,178	,0022	,910	1,446
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			
[Distance60=1]	-,226	,0013	-,370	-,122
[Distance100=0]	0[a]			
[Distance100=1]	-1,013	,0016	-1,224	-,802
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
Emplo	,321	,0008	,313	,329
Labour	1,519	,0043	1,154	1,884
Distance	-,022	,0002	-,024	-,020
Unemplo	,738	,0070	,405	1,071
Wagedi	-1,350	,0122	-1,357	-1,343
House	,341	,0066	,190	,492
Housedk	-,234	,0075	-,248	-,220
Educationswe	,177	,0085	,172	,182
Pop.	-1,442	,0134	-1,508	-1,376
(Scale)	1[b]			

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	55060,311	1	,000
[train=0]			
[train=1]	2157,991	1	,057
[city=0]			
[city=1]	133152,783	1	,065
[medium=0]			
[medium=1]	169666,909	1	,000
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	190187,999	1	,000
[Distance100=0]			
[Distance100=1]	7612,252	1	,000
[Distance160=0]			
[Distance160=1]			
emplo	121729,494	1	,000
labour	45939,557	1	,000
distance	984,132	1	,000
unemplo	1873,797	1	,000
wagedi	5059,889	1	,000
house	5261,859	1	,000
housedk	973,867	1	,000
educationswe	19661,229	1	,000
Pop.	1121,733	1	,000

Analysis Year 2003.

Generalized Negative Binomial regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Negative binomial (1)
Link Function	Log

Case Processing Summary

	N	Percent
Included	3855	100,0%
Excluded	0	,0%
Total	3855	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	368	9,5%
		Station	3487	90,5%
		Total	3855	100,0%
	City	Small	1262	32,7%
		Big	2593	67,3%
		Total	3855	100,0%
	Medium	No medium	3066	79,5%
		Medium	789	20,5%
		Total	3855	100,0%
	Small	No small	3382	87,7%
		small	473	12,3%
		Total	3855	100,0%
	Distance60	more	1157	30,0%
		Within 60	2698	70,0%
		Total	3855	100,0%
	Distance100	More	3226	83,7%
		60-100	629	16,3%

	Total	3855	100,0%
Distance160	More/less	3327	86,3%
	100-160	528	13,7%
	Total	3855	100,0%

Continued Categorical Variable Information

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	scancomm	3855	1	3855	1928,00	1112,987
Covariate	Employ	3855	3,7886	5,4145	4,907842	,5477228
	Labour	3855	3,4544	5,0151	4,698152	,4441636
	distance	3855	-2,2742	4,2984	-,899634	1,4662268
	unemplo	3855	-,3678	,4398	,092462	,1673753
	Wagedi	3855	-,3825	-,0242	-,166692	,0543668
	House	3855	2,6314	3,3051	3,195506	,1456705
	housedk	3855	3,2679	3,6376	3,396937	,0533977
	educationswe	3855	,1021	,5002	,266999	,0704266
	Pop.	3855	,5380	,9970	,947192	,0881181

Goodness of Fit[b]

	Value	Df	Value/df
Deviance	9551,432	3839	2,488
Scaled Deviance	9551,432	3839	
Pearson Chi-Square	7463,016	3839	1,944
Scaled Pearson Chi-Square	7463,016	3839	
Log Likelihood[a]	-40325,322		
Akaike's Information Criterion (AIC)	54523,259		
Finite Sample Corrected AIC (AICC)	54523,401		
Bayesian Information Criterion (BIC)	54623,373		
Consistent AIC (CAIC)	54639,373		

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
1541,019	15	,000

Dependent Variable: scancomm Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
1541,019	15	,000

Dependent Variable: scancomm Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	6,992	1	,000
Train	20,034	2	,066
City	3,291	1	,082
medium	5,823	1	,000
small	.[a]	.	
Distance60	4,991	1	,009
Distance100	7,209	1	,000
Distance160	.[a]	.	.
emplo	57,773	1	,000
labour	53,715	1	,000

distance	4,692	1	,003
unemplo	,023	1	,008
wagedi	,994	1	,009
house	,414	1	,000
housedk	,289	1	,001
educationswe	1,694	1	,003
Pop.	1,210	1	,001

Continuos Tests of Model Effects
Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.,

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter			95% Wald Confidence Interval	
	B	Std. Error	Lower	Upper
(Intercept)	3,589	1,5470	,557	6,621
[train=0]	0[a]			
[train=1]	,464	,0810	,222	,706
[city=0]	0[a]			
[city=1]	,130	,1455	,077	,183
[medium=0]	0[a]			
[medium=1]	,373	,0869	,291	,455
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]				
[Distance60=1]	-,268	,0643	-,381	-,155
[Distance100=0]				
[Distance100=1]	-1,411	,0857	-1,801	-1,021
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
emplo	,387	,0407	,316	,458
labour	1,990	,1629	1,049	2,931
distance	-,011	,0115	-,013	-,009

unemplo	1,249	,2771	,811	1,687
wagedi	-1,937	,6057	-2,077	-1,797
house	,632	,3361	,064	1,200
housedk	,032	,3572	,007	,057
educationswe	1,221	,4266	,918	1,524
Pop.	-,751	,4183	-,855	-,647
(Scale)	1[b]			
(Negative binomial)	1			

Continued **Parameter Estimates**

Dependent Variable: scancomm
Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educationswe, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	Df	Sig.
(Intercept)	5,381	1	,000
[train=0]			
[train=1]	,819	1	,065
[city=0]			
[city=1]	15,911	1	,079
[medium=0]			
[medium=1]	12,473	1	,000
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	156,509	1	,000
[Distance100=0]			
[Distance100=1]	4,774	1	,009
[Distance160=0]			
[Distance160=1]			
emplo	57,474	1	,000
labour	54,828	1	,000
distance	4,637	1	,004
unemplo	,023	1	,007
wagedi	,987	1	,001
house	,413	1	,002
housedk	,291	1	,009
educationswe	1,699	1	,002
Pop.	1,206	1	,000

Analysis Year 2004.

Negative Binomial Poisson regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

	N	Percent
Included	5945	100,0%
Excluded	0	,0%
Total	5945	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	498	8,4%
		Station	5447	91,6%
		Total	5945	100,0%
	City	Small	1439	24,2%
		Big	4506	75,8%
		Total	5945	100,0%
	Medium	No medium	5227	87,9%
		Medium	718	12,1%
		Total	5945	100,0%
	Small	No small	5224	87,9%
		Small	721	12,1%
		Total	5945	100,0%
	Distance60	More	1700	28,6%
		Within 60	4245	71,4%
		Total	5945	100,0%
	Distance100	More	4910	82,6%
		60-100	1035	17,4%

	Total	5945	100,0%
Distance160	More/less	5280	88,8%
	100-160	665	11,2%
	Total	5945	100,0%

continued **Categorical Variable Information**

Continuous Variable Information

		N	Minimum	Maximum
Dependent Variable	Scancomm	5945	1	5945
Covariate	Employ	5945	3,7737	5,4167
	Labour	5945	3,455606	5,020365
	Distance	5945	-2,2742	2,2742
	Unemplo	5945	-2,0846	2,0774
	Wagedi	5945	-1,2416	,0025
	House	5945	2,6758	3,4024
	Housedk	5945	2,8927	3,7019
	Educati	5945	,1118	,5167
	Pop.	5945	,5440	1,0030

Continuous Variable Information

		Mean	Std. Deviation
Dependent Variable	Scancomm	2973,00	1716,318
Covariate	Employ	4,895910	,5515154
	Labour	4,71721894	,445008428
	Distance	-,892561	1,5138978
	Unemplo	,084585	,1649545
	Wagedi	-,170506	,1268443
	House	3,290306	,1491737
	Housedk	3,205065	,2900233
	Educati	,287474	,0700905
	Pop.	,953953	,0908985

Goodness of Fit[b]

	Value	Df	Value/df
Deviance	134498,33	5930	22,681

Scaled Deviance	134498,33	5930	
Pearson Chi-Square	120586,55	5930	20,335
Scaled Pearson Chi-Square	120586,55	5930	
Log Likelihood[a]	-82306,863		
Akaike's Information Criterion (AIC)	165664,725		
Finite Sample Corrected AIC (AICC)	165664,806		
Bayesian Information Criterion (BIC)	165674,080		
Consistent AIC (CAIC)	165675,080		

Continued **Goodness of Fit**

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educati, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
5224620,962	14	,000

Dependent Variable: scancomm Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educati, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	Df	Sig.
(Intercept)	2849,636	1	,000
Train	136611,068	1	,010
City	451999,088	1	,022

medium	118134,611	1	,000
Small	.[a]		
Distance60	41283,737	1	0,00
Distance100	501929,811	1	0,00
Distance160	.[a]		
Employ	157974,971	1	,000
Labour	208519,756	1	,000
distance	54688,217	1	,000
unemplo	11,492	1	,001
wagedi	773,984	1	,000
House	113116,531	1	,000
housedk	8012,379	1	,000
educati	137001,537	1	,000
pop.	210939,115	1	,000

Continued **Tests of model effects**
Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educati, pop.

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter			95% Wald Confidence Interval	
	B	Std. Error	Lower	Upper
(Intercept)	2,266	,0263	2,215	2,318
[train=0]				
[train=1]	,785	,0356	,710	,860
[city=0]				
[city=1]	,648	,0454	,613	,683
[medium=0]				
[medium=1]	1,073	,0317	1,055	1,091
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			
[Distance60=1]	-,213	,0195	-,229	-,197

[Distance100=0]				
[Distance100=1]	-1,091	,0201	-1,215	-,967
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
emplo	,428	,0181	,426	,430
labour	1,631	,0586	1,624	1,638
distance	-,041	,0029	-,043	-,039
unemplo	,004	,0214	,002	,007
wagedi	-,053	,0315	-,057	-,049
house	,191	,0353	,187	,195
housedk	1,852	,0933	1,848	1,856
educati	1,958	,0877	1,947	1,968
Pop.	-1,105	,1485	-1,122	-1,088
(Scale)	1[b]			

Continued **Parameters estimates**
Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educati, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	7412,005	1	,000
[train=0]			
[train=1]	131267,387	1	,020
[city=0]			
[city=1]	54994,770	1	,045
[medium=0]			
[medium=1]	308293,428	1	,000
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	796406,456	1	,000
[Distance100=0]			

[Distance100=1]	32110,610	1	,000
[Distance160=0]			
[Distance160=1]			
emplo	151575,292	1	,000
labour	209330,638	1	,000
distance	55210,232	1	,000
unemplo	11,491	1	,001
wagedi	763,866	1	,000
house	106322,673	1	,000
housedk	7878,606	1	,000
educati	134376,376	1	,000
pop.	206047,180	1	,000

Continued **Parameters estimates**
Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educati, pop.

Analysis Year 2004.

Generalized Negative Binomial regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Negative binomial (1)
Link Function	Log

Case Processing Summary

	N	Percent
Included	5945	100,0%
Excluded	0	,0%
Total	5945	100,0%

Categorical Variable Information

			N	Percent
Factor	Train	No station	498	8,4%
		Station	5447	91,6%
		Total	5945	100,0%

City	Small	1439	24,2%
	Big	4506	75,8%
	Total	5945	100,0%
Medium	No medium	5227	87,9%
	Medium	718	12,1%
	Total	5945	100,0%
Small	No small	5224	87,9%
	Small	721	12,1%
	Total	5945	100,0%
Distance60	More	1700	28,6%
	Within 60	4245	71,4%
	Total	5945	100,0%
Distance100	More	4910	82,6%
	60-100	1035	17,4%
	Total	5945	100,0%
Distance160	More/less	5280	88,8%
	100-160	665	11,2%
	Total	5945	100,0%

continued **Categorical Variable Information**

Continuous Variable Information

		N	Minimum	Maximum
Dependent Variable	Scancomm	5945	1	5945
Covariate	Employ	5945	3,7737	5,4167
	Labour	5945	3,455606	5,020365
	Distance	5945	-2,2742	2,2742
	Unemplo	5945	-2,0846	2,0774
	Wagedi	5945	-1,2416	,0025
	House	5945	2,6758	3,4024
	Housedk	5945	2,8927	3,7019
	Educati	5945	,1118	,5167
	Pop.	5945	,5440	1,0030

continued Continuous variable information

Continuous Variable Information

		Mean	Std. Deviation
Dependent Variable	Scancomm	2973,00	1716,318
Covariate	Employ	4,895910	,5515154
	Labour	4,71721894	,445008428
	Distance	-,892561	1,5138978
	Unemplo	,084585	,1649545
	Wagedi	-,170506	,1268443
	House	3,290306	,1491737
	Housedk	3,205065	,2900233
	Educati	,287474	,0700905
	Pop.	,953953	,0908985

Goodness of Fit[b]

	Value	df	Value/df
Deviance	15216,38	5930	2,566
Scaled Deviance	15216,38	5930	
Pearson Chi-Square	11901,51	5930	2,007
Scaled Pearson Chi-Square	11901,51	5930	
Log Likelihood[a]	-52298,021		
Akaike's Information Criterion (AIC)	104626,043		
Finite Sample Corrected AIC (AICC)	104626,124		
Bayesian Information Criterion (BIC)	104726,397		
Consistent AIC (CAIC)	104741,397		

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educati, pop.

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
2384,172	14	,000

Dependent Variable: scancomm Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educati, pop.

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	Df	Sig.
(Intercept)	5,360	1	,006
Train	122,510	1	,000
City	641,499	1	,000
Medium	812,118	1	,000
Small	.a		
Distance60	77,515	1	,000
Distance100	183,943	1	,000
Distance160	.a		
Employ	89,410	1	,000
Labour	121,772	1	,000
Distance	9,842	1	,002
Unemplo	1,237	1	,006
Wagedi	,009	1	,004
House	33,351	1	,000
Housedk	5,417	1	,000
Educati	46,782	1	,000
pop.	94,645	1	,000

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educati, pop.

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval Lower	Upper
(Intercept)	2,733	1,1223	,534	4,933
[train=0]	0[a]			
[train=1]	,733	,0292	,655	,811
[city=0]	0[a]			
[city=1]	,526	,0610	,499	,553
[medium=0]	0[a]			
[medium=1]	,696	,0353	,622	,770
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			
[Distance60=1]	-,119	-,0259	-155	-,083
[Distance100=0]	0[a]			
[Distance100=1]	-1,301	,0298	-1,459	-1,143
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
Employ	,471	,0227	,374	,567
Labour	1,567	,0649	1,290	1,844
Distance	-,033	,0048	-,053	-,012
Unemplo	,118	,0481	-,088	,323
Wagedi	-,012	,0601	-,269	,244
House	,222	,0436	,111	,333
housedk	1,520	,1178	1,017	2,023
educati	2,287	,1511	1,642	2,932
Pop.	-1,261	,1532	-1,916	-,606
(Scale)	1[b]			
(Negative binomial)	1			

Dependent Variable: scancomm

Model: (Intercept), train, city, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wagedi, house, housedk, educati, pop.

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	5,931	1	,000
[train=0]			
[train=1]	133,089	1	,000
[city=0]			
[city=1]	15,673	1	,000
[medium=0]			
[medium=1]	81,846	1	,000
[small=0]	.	.	.
[small=1]	.	.	.
[Distance60=0]			
[Distance60=1]	402,233	1	,000
[Distance100=0]			
[Distance100=1]	4,467	1	,000
[Distance160=0]	.	.	.
[Distance160=1]	.	.	.
emplo	90,438	1	,000
labour	122,944	1	,000
distance	9,760	1	,000
unemplo	1,260	1	,002
wagedi	,009	1	,005
house	35,082	1	,000
housedk	5,483	1	,000
educati	48,238	1	,000
pop.	95,470	1	,000

Analysis Year 2005.
Negative Binomial Poisson regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

	N	Percent
Included	7365	100,0%
Excluded	0	,0%
Total	7365	100,0%

Continued Case Processing Summary

Categorical Variable Information

			N	Percent
Factor	City	No big	1683	22,9%
		Big	5682	77,1%
		Total	7365	100,0%
	Train	No station	580	7,9%
		Station	6785	92,1%
		Total	7365	100,0%
	medium	No medium	6532	88,7%
		Medium	833	11,3%
		Total	7365	100,0%
	Small	No small	6515	88,5%
		Small	850	11,5%
		Total	7365	100,0%
	Distance60	More	1955	26,5%
		Within 60	5410	73,5%
		Total	7365	100,0%
	Distance100	More	6105	82,9%
		60-100	1260	17,1%
		Total	7365	100,0%
	Distance160	More/less	6670	90,6%
		100-160	695	9,4%
		Total	7365	100,0%

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Scancomm	7365	1	7365	3683,00	2126,237
Covariate	Employ	7365	3,7842	5,4258	4,882865	,5563263
	Labour	7365	3,4545	5,0273	4,738025	,4391223
	Distance	7365	-2,2742	2,2302	-1,316533	1,1544955
	Unemplo	7365	-,3577	,4307	,087227	,1062284
	Wage	7365	-,3988	,0066	-,160922	,0570800
	House	7365	2,7243	3,4504	3,346474	,1435912
	Housedk	7365	3,3897	3,8458	3,551919	,0880019
	Educatio	7365	,1170	,5121	,286006	,0674940
	Populat	7365	,544	,998	,95149	,088936

Goodness of Fit[b]

	Value	df	Value/df
Deviance	182493,15	7350	24,829
Scaled Deviance	182493,15	7350	
Pearson Chi-Square	165169,2	7350	22,472
Scaled Pearson Chi-Square	165169,2	7350	
Log Likelihood[a]	-118388,546		
Akaike's Information Criterion (AIC)	237680,092		
Finite Sample Corrected AIC (AICC)	237680,157		
Bayesian Information Criterion (BIC)	237691,659		
Consistent AIC (CAIC)	237692,659		

Dependent Variable: scancomm

Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wage, house, housedk, educatio, populat

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
8169649,903	14	,000

Dependent Variable: scancomm Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wage, house, housedk, educatio, populat

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	Df	Sig.
(Intercept)	97590,637	1	,000
City	77128,515	1	,000
Train	39822,798	1	,000
Medium	162533,991	1	,000
Small	.a		
Distance60	342819,716	1	,000
Distance100	81745,77	1	,000
Distance160	.a		
Emplo	341067,281	1	,000
Labour	264308,626	1	,000
Distance	18343,920	1	,000
Unemplo	3620,948	1	,000
Wage	28257,426	1	,000
House	5132,448	1	,000
Housedk	3839,409	1	,000
Educatio	44045,351	1	,000
Pop.	27670,256	1	,000

Dependent Variable: scancomm

Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wage, house, housedk, educatio, populat

a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval	
			Lower	Upper
(Intercept)	7,345	,0201	7,305	7,384
[city=0]	0[a]			
[city=1]	,371	,0333	,354	,388
[train=0]	0[a]			
[train=1]	1,212	,0371	1,055	1,369
[medium=0]	0[a]			
[medium=1]	1,383	,0263	1,315	1,451
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			
[Distance60=1]	-,292	,0166	-,298	-,286
[Distance100=0]	0[a]			
[Distance100=1]	-1,000	,0184	-1,008	-,992
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
emplo	,325	,0097	,324	,326
labour	1,450	,0517	1,444	1,455
distance	-,025	,0033	-,028	-,022
unemplo	,287	,0849	,279	,297
wage	-1,146	,1208	-1,160	-1,133
house	,178	,0512	,145	,211
housedk	,345	,0851	,344	,346
educatio	,914	,0778	,901	,927
Pop.	-1,320	,1413	-1,923	-,717
(Scale)	1[b]			

Dependent Variable: scancomm

Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wage, house, housedk, educatio, populat

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	133056,225	1	,000
[city=0]			
[city=1]	335372,589	1	,000
[train=0]			
[train=1]	38896,795	1	,000
[medium=0]			
[medium=1]	865094,576	1	,000
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	921563,342	1	,000
[Distance100=0]			
[Distance100=1]	96256,005	1	,000
[Distance160=0]			
[Distance160=1]			
emplo	349449,941	1	,000
labour	246804,346	1	,000
distance	18195,077	1	,000
unemplo	3595,908	1	,000
wage	28217,566	1	,000
house	5161,729	1	,000
housedk	3786,555	1	,000
educatio	43377,866	1	,000
populat	27375,422	1	,000

Dependent Variable: scancomm

Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wage, house, housedk, educatio, populat

Analysis Year 2005.

Generalized Negative Binomial regression.

Model Information

Dependent Variable	Scancomm
Probability Distribution	Negative binomial (1)
Link Function	Log

Case Processing Summary

	N	Percent
Included	7365	100,0%
Excluded	0	,0%
Total	7365	100,0%

Categorical Variable Information

			N	Percent
Factor	City	No big	1683	22,9%
		Big	5682	77,1%
		Total	7365	100,0%
	Train	No station	580	7,9%
		station	6785	92,1%
		Total	7365	100,0%
	Medium	No medium	6532	88,7%
		medium	833	11,3%
		Total	7365	100,0%
	Small	No small	6515	88,5%
		small	850	11,5%
		Total	7365	100,0%
	Distance60	more	1955	26,5%
		Within 60	5410	73,5%
		Total	7365	100,0%
	Distance100	More	6105	82,9%
		60-100	1260	17,1%

	Total	7365	100,0%
Distance160	More/less	6670	90,6%
	100-160	695	9,4%
	Total	7365	100,0%

Continued **Categorical Variable Information**

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Scancomm	7365	1	7365	3683,00	2126,237
Covariate	Employ	7365	3,7842	5,4258	4,882865	,5563263
	Labour	7365	3,4545	5,0273	4,738025	,4391223
	Distance	7365	-2,2742	2,2302	-1,316533	1,1544955
	Unemplo	7365	-,3577	,4307	,087227	,1062284
	Wage	7365	-,3988	,0066	-,160922	,0570800
	House	7365	2,7243	3,4504	3,346474	,1435912
	Housedk	7365	3,3897	3,8458	3,551919	,0880019
	Education	7365	,1170	,5121	,286006	,0674940
	Populat	7365	,544	,998	,95149	,088936

Goodness of Fit[b]

	Value	df	Value/df
Deviance	20410,95	7350	2,777
Scaled Deviance	20410,95	7350	
Pearson Chi-Square	17110,8	7350	2,328
Scaled Pearson Chi-Square	17110,8	7350	
Log Likelihood[a]	-66371,654		
Akaike's Information Criterion (AIC)	132773,307		
Finite Sample Corrected AIC (AICC)	132773,373		
Bayesian Information Criterion (BIC)	132876,875		
Consistent AIC (CAIC)	132891,875		

Dependent Variable: scancomm
Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wage, house, housedk, educatio, populat

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
2943,835	14	,000

Dependent Variable: scancomm Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wage, house, housedk, educatio, populat

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	12,936	1	,000
City	22,412	1	,000
Train	13,444	1	,000
Medium	31,727	1	,000
Small	.[a]		
Distance60	72,271	1	,000
Distance100	67,818	1	,000
Distance160	.[a]		
Employ	96,584	1	,000
Labour	135,125	1	,000

Distance	21,229	1	,000
Unemplo	6,134	1	,003
wage	13,622	1	,000
house	2,372	1	,000
housedk	2,492	1	,004
educatio	,757	1	,004
Pop.	,923	1	,007

Continued **Tests of model effects**
Dependent Variable: scancomm
Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, Conunemplo, wage, house, housedk, educatio, populat
a. Unable to compute because the estimable function has zero degrees of freedom.

Parameter Estimates

Parameter			95% Wald Confidence Interval	
	B	Std. Error	Lower	Upper
(Intercept)	4,313	1,2867	1,791	6,835
[city=0]	0[a]			
[city=1]	,254	,0317	,244	,264
[train=0]	0[a]			
[train=1]	,543	,0581	,288	,798
[medium=0]	0[a]			
[medium=1]	,623	,0360	,161	1,085
[small=0]	0[a]			
[small=1]	0[a]			
[Distance60=0]	0[a]			
[Distance60=1]	-,195	,0253	-,202	-,188
[Distance100=0]	0[a]			

[Distance100=1]	-1,351	,0333	-1,699	-1,003
[Distance160=0]	0[a]			
[Distance160=1]	0[a]			
Employ	,346	,0163	,276	,415
Labour	1,644	,0642	1,371	1,917
Distance	-,057	,0056	-,081	-,033
Unemplo	,772	,1422	,167	1,377
age	-1,697	,2118	-2,598	-,796
House	,292	,0843	,067	,517
Housedk	,408	,1228	,114	,702
Education	,294	,1554	,055	,533
Populat	-,315	,1513	-,338	-,292
(Scale)	1[b]			
(Negative binomial)	1			

Continued Parameter Estimates
Dependent Variable: scancomm

Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wage, house, housedk, educatio, populat

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Parameter Estimates

Parameter	Hypothesis Test		
	Wald Chi-Square	df	Sig.
(Intercept)	11,236	1	,000
[city=0]			
[city=1]	18,514	1	,000
[train=0]			
[train=1]	13,631	1	,000
[medium=0]			
[medium=1]	63,461	1	,000
[small=0]			
[small=1]			
[Distance60=0]			
[Distance60=1]	349,933	1	,000

[Distance100=0]			
[Distance100=1]	12,549	1	,000
[Distance160=0]			
[Distance160=1]			
emplo	94,976	1	,000
labour	139,225	1	,000
distance	21,769	1	,000
unemplo	6,255	1	,000
wage	13,620	1	,000
house	2,347	1	,004
housedk	2,548	1	,004
educatio	,760	1	,003
Pop.	,921	1	,003

Continued **Parameter Estimates**

Dependent Variable: scancomm

Model: (Intercept), city, train, medium, small, Distance60, Distance100, Distance160, emplo, labour, distance, unemplo, wage, house, housedk, educatio, populat